0000010517

BEFORE THE [illegible] **COMMISSION**

EXHIBIT
Q-14
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. _____

TESTIMONY OF

KAREN A. STEWART

U S WEST COMMUNICATIONS

JANUARY 8, 1999

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Marta T. Hetzer
Administrator/Owner

Suite Three
2627 North Third Street
Phoenix, AZ 85004-1103
(602) 274-9944
FAX: (602) 277-4264

EXPLANATION REGUARDING CONFIDENTIAL EXHIBITS NOT ENCLOSED HERE

HAND DELIVERED

December 6, 2000

TRANSMITTAL OF CONFIDENTIAL EXHIBITS

Ms. Jane L. Rodda
Acting Chief Administrative Law Judge
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, AZ 85007

Re: Qwest / Rates T-01051B-99-0105, etc.

Dear Ms. Rodda:

The following exhibits are enclosed for your safekeeping:

AT&T - 1, 2, 4, 5, 6, and 8;
Cox - 2 and 3;
Qwest - 47;
RUCO - 1, 2, 3, 6, 7, 10, 12 and 20;
Staff - 21 and 22;
WCom - 1, 2, and 3.

These exhibits are subject to the confidentiality agreement and have been omitted from the filing with Docket Control.

If you have any questions, or if we can be of any further assistance, please let us know.

Very truly yours,

Marta T. Hetzer
Administrator/Owner

Enclosures

Copy to: ACC Legal Division
AT&T
Cox
Qwest
RUCO
WorldCom

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EXECUTIVE SUMMARY

1. Current Responsibilities

My current responsibilities include representing U S WEST in regulatory proceedings for a variety of U S WEST products and services, including the high capacity services that are the subject of this testimony.

2. Purpose of Testimony

The purpose of my testimony is to demonstrate that the Arizona market for high capacity digital services is very competitive. U S WEST faces intense competition from both established facilities-based competitors (with substantial resources and extensive fiber networks) and an ever growing list of resellers. Given this level of competition, U S WEST requests that the Commission approve the deregulation of the following digital high capacity services: DS1 and DS3 transport services (including Switched Access transport), Frame Relay Service (FRS), ATM Cell Relay Service (ATM CRS), LAN Switching Services (LSS), Transparent LAN Service (TLS), and Megabit Services. In light of U S WEST's lack of market power for these services, U S WEST believes that competition rather than regulation ought to control prices, terms and conditions.

3. Summary of Testimony

U S WEST Communications, Inc. (U S WEST), pursuant to A.R.S. § 40-281(e), requests that the Arizona Corporation Commission (Commission) exercise its authority to deregulate high capacity data services provided by U S WEST in Arizona, and requests the withdrawal of the filed tariffs applicable to such services.

In this testimony, U S WEST demonstrates that the Arizona market for high capacity services is very competitive. U S WEST faces intense competition from both resellers and established facilities-based competitors with substantial resources and extensive fiber networks. These established companies,

which include ELI, GST, the combined AT&T/TCG, and merged companies MCI, MFS, WorldCom and Brooks Fiber (MCI WorldCom), have access to financial resources equal to or greater than U S WEST's with which to fund expansion of their networks.

Attached as Exhibit KAS-1 is an economic evaluation conducted by Professors Alfred E. Kahn and Timothy J. Tardiff, who conclude that U S WEST lacks market power in the Phoenix area for high capacity services. In light of U S WEST's lack of market power, Kahn and Tardiff conclude that competition is sufficient to constrain prices and other terms and conditions of service. Clearly, regulation is not necessary to ensure that U S WEST's rates and practices remain just, reasonable and non-discriminatory.

The Kahn and Tardiff analysis is specific to the Phoenix Metropolitan Area (MSA). However, I will be providing additional information about the availability of alternatives in other areas such as Tucson. The Phoenix and Tucson MSAs represent the vast majority of the high capacity market in the state. For example, of U S WEST's DS1 channel terminations in the state, about 90% percent are located in either Phoenix or Tucson. Therefore, it is reasonable for the Commission to place more emphasis on the competitive status of high capacity services in Arizona by focusing on the Phoenix and Tucson MSAs.

First, U S WEST has a steadily declining market share. The market analysis conducted by Quality Strategies (attached as Exhibit KAS-2) demonstrates that competitive providers have captured more than 70 percent of the retail market for high capacity services. Perhaps the most important trend statistic is the fact that, between the second and fourth quarter of 1997, competitive providers captured about half of the growth in demand for high capacity services. Moreover, it is important to note that the combined competitive providers' market share has been growing at even a faster pace than the rapid growth in the demand for high capacity services in the Phoenix area.

Second, there is high demand elasticity. The customers that tend to purchase high capacity facilities – medium to large businesses, governmental entities and other carriers – are highly sensitive to price and other service characteristics. The ability of U S WEST's largest carrier customers to migrate high capacity traffic to their own affiliated fiber networks further increases their bargaining ability.

Third, there is high supply elasticity. Competitive providers have deployed more than 800 route miles of optical fiber in the Phoenix MSA. In addition, e.spire claims that its Tucson 108 mile fiber optic ring is the largest in that city[1]. These extensive fiber backbone networks could handle all of U S WEST's end user and transport traffic at less than eight percent capacity. A majority of U S WEST's current high capacity demand is located within 100 feet of the competitive providers' networks, which means that it could be absorbed almost immediately at minimal cost. Moreover, as the attached report prepared by POWER Engineers, Inc. (PEI) (Exhibit KAS-3) demonstrates, competitive providers would not incur significant costs to extend their fiber networks to absorb the vast majority of U S WEST's current high capacity demand. In addition, the impressive growth of competitive providers' market share demonstrates that the cost of entry is not prohibitive.

Fourth, U S WEST does not enjoy an advantage in terms of its costs, structure, size and resources. Indeed, the combined AT&T/TCG and MCI WorldCom companies have a significant advantage in terms of scale economies and access to capital, not to mention the advantage of being able to provide interLATA services. The presence of facility-based competitive activity in the market while prices are dropping steadily is a strong indication that U S WEST does not have a cost advantage in the market.

Finally, my testimony describes the specific high capacity and associated data services for which U S WEST requests deregulation. These services include: DS1 and DS3 transport services (including

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1 e.spire Tucson web site

Switched Access transport), Frame Relay Service (FRS), ATM Cell Relay Service (ATM CRS), LAN Switching Services (LSS), Transparent LAN Service (TLS), and Megabit Services

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH U S WEST.

A. My name is Karen A. Stewart. My title is Director, Markets-Regulatory Strategy. My office is located at 421 SW Oak Street, Portland, Oregon.

Q. PLEASE DESCRIBE YOUR EDUCATION BACKGROUND AND EMPLOYMENT EXPERIENCE.

A. I received a Bachelor of Science degree in Business Administration from Portland State University in 1980, and a Masters degree in Business Administration from the University of Oregon in July, 1994. I have been employed by U S WEST since 1981 (then Pacific Northwest Bell). I have held a variety of positions in U S WEST, including sales, product management, regulatory affairs, issues management, and E911 service and technical design.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE ANY PUBLIC UTILITY COMMISSION?

A. Yes. Under the name of Karen A. Baird, I have testified in the states of Colorado, Idaho, Iowa, New Mexico, Minnesota, Nebraska, North Dakota, Oregon, South Dakota, Utah and Washington.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to demonstrate that the Arizona market for high capacity digital services is robustly competitive. U S WEST faces intense competition from both established facilities-based competitors (with substantial resources and extensive fiber networks) and an ever growing list of resellers. Given this level of competition, U S WEST requests that the Commission allow the deregulation of the following digital high capacity services: DS1 and DS3 transport services (including Switched Access transport), Frame Relay Service (FRS), ATM Cell Relay Service (ATM CRS), LAN Switching Services (LSS), Transparent LAN Service (TLS), and Megabit Services. In light of U S WEST's lack of market power for these services, the competition is

sufficient to constrain U S WEST's ability to impose anti-competitive prices and other terms and conditions of service. Additionally, these competitive high capacity services are not essential basic telephone services.

BASIS FOR DEREGULATION REQUEST

Q. WHAT IS THE BASIS FOR THE U S WEST REQUEST TO DEREGULATE HIGH CAPACITY SERVICES?

A. This request is made pursuant to A.R.S. § 40-281(e), which provides:

> When the commission determines after notice and hearing that any product or service of a telecommunications corporation is neither essential nor integral to the public service rendered by such corporation, it shall declare that such product or service is not subject to regulation by the commission.

My testimony focuses on the factual development of the competitive market place that provides clear evidence to this Commission that U S WEST does not have market power with respect to high capacity services.

In general, regulation of telecommunications services has always been a surrogate for the competitive market place. Now, as demonstrated by this testimony, the competitive market place for high capacity digital service has developed to a point where regulation is no longer necessary. In fact, the continued regulation of these services may hinder the ability of Arizona customers to realize the full benefits of a competitive market place.

Q. CAN YOU PROVIDE EXAMPLES OF BENEFITS FOR ARIZONA CUSTOMERS IF U S WEST'S HIGH CAPACITY SERVICES WERE DEREGULATED?

A. Yes. U S WEST appears to be the only carrier that maintains the required tariffs and files cost support for high capacity services. This not only imposes an unfair regulatory burden on U S WEST, it gives all of our competitors advance knowledge of our rates, terms and conditions. The competitors can use this advance knowledge to make instant changes to their service offerings.

What competitors frequently do is use U S WEST's rates as a bench mark that they can marginally undercut, versus having to provide a customer with their best rates based on their own costs and network efficiencies

Q. WHAT ABOUT AREAS WHERE COMPETITORS MAY NOT HAVE THEIR OWN NETWORKS INSTALLED?

A. Later in my testimony I will discuss the ability of competitors to expand their networks in a fast and efficient manner to reach urban business customers. In reality, with the resale and unbundling requirements of the Telecommunications Act of 1996, our competitors have access to the U S WEST network to reach customers statewide (both urban and rural) with cost-based network rates from U S WEST.

These resale and unbundling requirements mean that U S WEST cannot sustain unreasonable mark-ups over cost in rural areas (even in areas without facility based competitors) because competitors can quickly begin servicing these customers on a resale basis. The large established competitors in Arizona are quite capable of seamlessly integrating U S WEST network facilities with their own facilities and services to provide an end to end high capacity service to the rural market.

Q. HAS U S WEST APPLIED FOR FORBEARANCE FROM REGULATION AS A DOMINANT CARRIER OF HIGH CAPACITY SERVICES AT THE INTERSTATE LEVEL?

A. Yes. On August 24, 1998, U S WEST filed with the Federal Communications Commission (FCC) a petition for forbearance from regulation as a dominant carrier in the Phoenix Metropolitan Statistical Area (MSA), for special access and dedicated transport for switched access at DS1 and higher transmission levels. This petition is still pending before the FCC.[2] In support of that filing, U S WEST included several reports on market participants, market descriptions and the

[2] CC Docket No. 98-157

engineering of the Phoenix high capacity market. I will rely on those reports to describe the competitive high capacity market.

Q. WHY IS THE DS1 AND DS3 HIGH CAPACITY COMPETITIVE MARKET PERTINENT TO THE DEREGULATION OF OTHER HIGH CAPACITY SERVICES?

A. DS1 and DS3 transport facilities are the backbone that enable the provision of other high capacity services.

COMPETITIVE MARKET PLACE

Q. HOW CAN THE COMMISSION ASSESS THE MARKET POWER U S WEST HAS FOR HIGH CAPACITY SERVICES IN ARIZONA?

A. In assessing market power, the Commission can rely on several factors as part of its analysis, including: (i) market participants; (ii) market share; (iii) the demand elasticity of customers; (iv) the supply elasticity of the market; and (v) the carrier's cost, structure, size and resources. Assessment of these general characteristics of the Phoenix area market for high capacity services demonstrates that U S WEST cannot exercise market power.

Q. WHO ARE THE MARKET PARTICIPANTS?

A. Prior to talking specifically about high capacity services, it is important to note that the business market in Arizona is attracting a broad array of powerful, well-funded competitors known as competitive local exchange carriers (CLECs) or Competitive Access Providers (CAPs). These competitors have at least three ways to provide services to end user customers.

First, a CLEC may provide a service solely over its own network and switching facilities. As demonstrated by the Quality Strategies study of high capacity services in Phoenix, CLECs have over 800 miles of fiber optic cable and have several hundred buildings connected to their networks.

Second, a CLEC may also purchase bits and pieces of the U S WEST network, known as unbundled network elements (UNEs), and combine the UNEs with their own facilities and switching to offer a complete service to an end-user. In order to combine U S WEST UNEs with parts of their own networks, a CLEC collocates in a U S WEST central office

Third, CLECs may simply purchase services from U S WEST at a discount and resell those services to their customers. Frequently their customers are oblivious to what carrier is providing the underlying network facilities.

There are no obstacles to market entry as evidenced by the following facts:

- 65 CLECs have applied for certification to provide local telecommunications service; 16 have been certified to date.
- 55 collocation cages have been completed and are being occupied by CLECs; there are also 66 virtual collocations

By collocating in just 31 of U S WEST's Arizona central offices so far, the CLECs are able to reach and target 58 percent of the total access lines currently served by U S WEST in Arizona. Because CLECs have the ability to pick and choose where they serve and what services they will offer, they can effectively target their investments to generate the greatest returns. Clearly, the vast majority of business customers in Arizona have competitive alternatives available to them right now for all services, not just high capacity services.

Q. WHO ARE THE MARKET PARTICIPANTS SPECIFIC TO HIGH CAPACITY SERVICES?

A. The Arizona market for high capacity services is characterized by a number of established competitors, each with substantial resources. The following is a brief description of the major facilities-based market participants:

1 **ELI** has over 400 route miles of fiber in the Phoenix area and 30 to 45 buildings on its network.[3] ELI
2 also claims to have invested $37 million in new facilities in Phoenix.[4] Far from being a start-up, ELI
3 is a subsidiary of Citizens Utilities Company, a large utility company and full-service
4 telecommunications services provider.[5] Moreover, ELI is a rapidly growing company. In 1997
5 alone, ELI's revenues increased 95 percent, from $31.3 million to $61.1 million. ELI's network
6 services revenue (which includes private line services) increased from $18.7 million in 1996 to
7 $33.5 million in 1997, an increase of 78.9 percent.[6] In addition, ELI's route miles increased from
8 1,428 to 2,494, an increase of 74.6 percent, and its fiber miles increased from 97,665 miles to
9 140,812 miles, an increase of 44.2 percent.[7]
10
11 **GST** has approximately 300 route miles of fiber in Arizona, including more than 11 miles of fiber in
12 downtown Phoenix and a long haul fiber link between Phoenix and Tucson.[8] GST has wired 15 to
13 25 buildings on its network. GST also installed more than 50,000 access lines in 1997 and 16,000
14 additional access lines in the first quarter of 1998.[9] In the first quarter of 1998, GST acquired a long
15 distance company, Call America Phoenix.[10]
16
17 **MCI** has 20 to 40 route miles of fiber in the Phoenix area and 25 to 35 buildings on its network.[11]
18 The merger of MCI and MFS WorldCom has now been approved. MCI WorldCom has 75 route

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3 Exhibit KAS-2, Quality Strategies Report at 26.

4 http://www.eli.net/phxswitch.html.

5 http://www.eli.net/history.html. Citizens Utilities had revenues of $1.4 billion in 1997, an increase of 8% over 1996. http://www.czn.net/PressReleases/pr031298.html.

6 http://www.eli.net/annual.pdf.

7 Id.

8 Exhibit KAS-2, Quality Strategies Report at 26.

9 http://www.gstcorp.com/investors/March10k.html.

10 http://www.gstcorp.com/press/gen86.html.

11 Exhibit KAS-2, Quality Strategies Report at 25.

1 miles of fiber in the Phoenix area and more than 50 buildings on its network.[12] In addition MCI
2 WorldCom has access to the Brooks Fiber facilities in Tucson.
3
4 **AT&T/TCG** has over 300 route miles in the Phoenix area and more than 150 buildings on its
5 network.[13] The merger of TCG and AT&T was recently completed, and AT&T has already begun
6 the process of migrating all of its dedicated high capacity traffic from U S WEST to its affiliated TCG
7 fiber network.
8
9 Clearly, none of these providers of high capacity services can be classified as "start-up" companies.
10 According to Quality Strategies, ELI and TCG entered the market in 1994, MFS WorldCom entered
11 the market in 1995, MCI entered the market in 1996 and GST entered the market in 1997. Further,
12 these companies have access to financial resources equal to or greater than U S WEST's that can
13 be used to fund expansion of their networks serving Phoenix customers of high capacity services.
14
15 For example, in the past two years, MCI WorldCom acquired two competitive providers, MFS and
16 Brooks Fiber, for a combined price of $16.4 billion – an amount almost identical to what SBC paid to
17 acquire Pacific Telesis. The combined MCI and MFS WorldCom company has 22 million
18 customers and revenues of more than $30 billion.[14] Similarly, AT&T recently acquired TCG at a
19 cost of $11.3 billion and announced its intention to acquire TCI at a cost of $48 billion. The sheer
20 size of the combined AT&T/TCG and MCI WorldCom companies dwarfs U S WEST.
21
22 Equally as important, the recently completed mergers of TCG with AT&T, and MCI with MFS
23 WorldCom, means the two largest purchasers of high capacity services in Phoenix now have their
24 own competitive fiber networks. This is a significant development, given that AT&T/TCG and MCI

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12 Id.

13 Id.

14 http://www.wcom.com/about_worldcom/press_releases/archive/1998/980914.shtml.

WorldCom account for approximately half of U S WEST's high capacity business in the Phoenix MSA. In addition, MCI WorldCom has access to its affiliate extensive fiber network in Tucson.

In fact, U S WEST already is experiencing the effects of the mergers, as significant portions of these customers' high capacity services have been migrated to the affiliated competitive fiber networks. Kahn and Tardiff observe that "[i]t would be difficult to conceive of a more substantial consequent diminution of whatever market power [U S WEST] might previously have enjoyed."[15]

In addition to giving AT&T and MCI WorldCom access to their own high capacity facilities, the consolidations by AT&T and MCI WorldCom with facilities-based access providers will result in the merged companies now competing head-to-head with U S WEST in the Phoenix and Tucson area markets for high capacity services.

Q. HAS THE U S WEST MARKET SHARE FOR HIGH CAPACITY SERVICES DECLINED?

A. Yes. U S WEST's steadily declining market share for high capacity services in the Phoenix MSA supports the conclusion that U S WEST lacks market power.[16] Quality Strategies uses DS1 equivalents as the basis for its market share calculations because DS1 bandwidth is deemed the baseline for the high capacity services market.[17] For analytical purposes, Quality Strategies describes the Phoenix area market for high capacity services as a three-tier market, with U S WEST and other providers selling services to end users, resellers and other carriers for transport purposes.[18] As the following chart depicts, this market can be sub-divided based on who high capacity services are sold to – retail and wholesale segments – versus who is ultimately using the underlying facilities – the "provider" and "transport" segments.[19]

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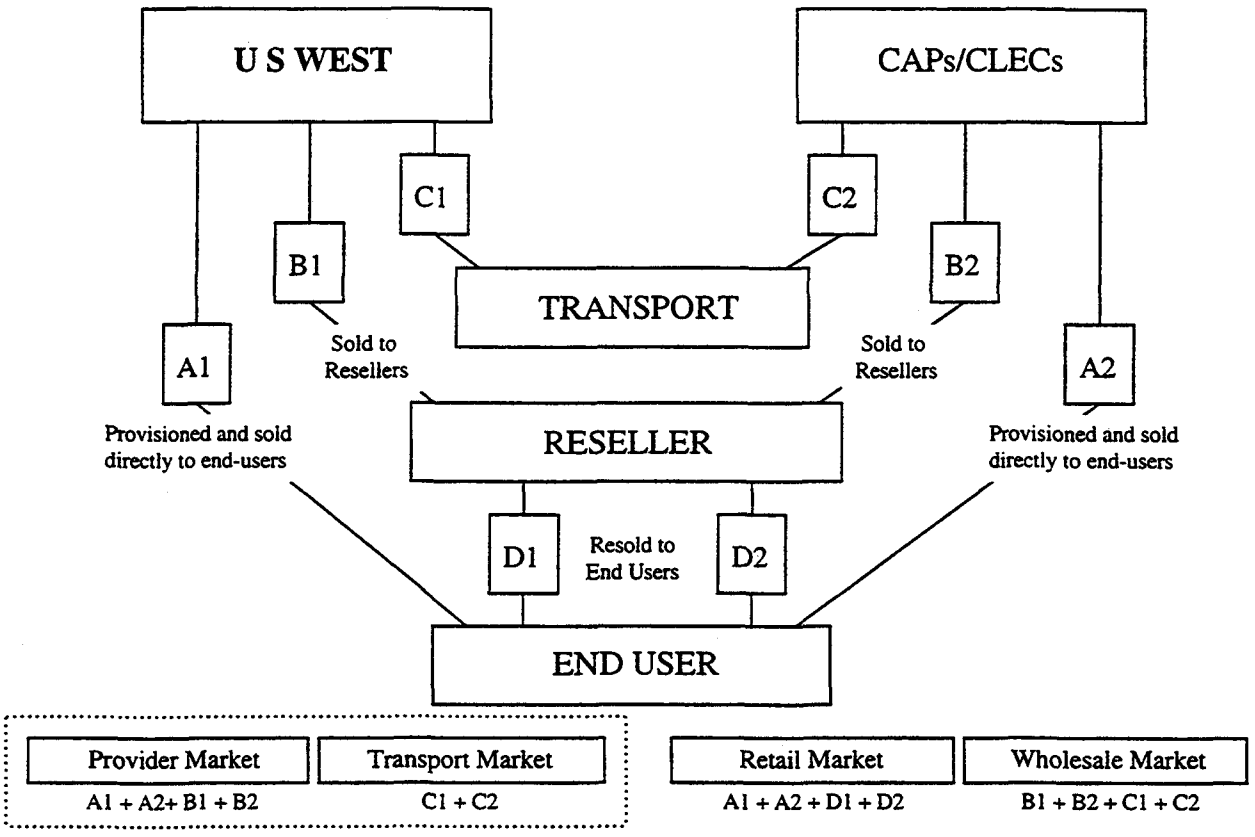
[15] Exhibit KAS-1, Kahn and Tardiff Paper at 6.

[16] See AT&T Reclassification Order, 11 FCC Rcd. at 3307 ¶ 67.

[17] Exhibit KAS-2, Qualities Strategies Report at 35.

[18] Id. at 9-10.

[19] Id.



The attached market analysis conducted by Quality Strategies shows that competitive providers have captured more than 70 percent of the retail market for high capacity services.[20] This is the most important market share statistic because it identifies who has the direct relationship with the customer. The carrier who has the direct relationship with the customer clearly has the advantage in selling additional services. In fact, in a resale situation, the customer may not even be aware of what carrier actually provides the underlying high capacity facilities.

Therefore, the competitive providers in Phoenix already have a significant marketing advantage over U S WEST, regardless of the actual volume of facilities U S WEST provides. All competitors in the Phoenix and Tucson MSAs (other than U S WEST), can take advantage of their relationships with customers to offer a full service package which includes interLATA voice and data services.

[20] Id. at 17. The combined AT&T/TCG and MCI WorldCom companies comprise over 50% of the retail market.

Moreover, expansion of competitive providers' business has been even more rapid than the impressive 13 percent growth in the demand for high capacity services in the Phoenix market.[21] During the period from the fourth quarter of 1994 to the fourth quarter of 1997, the competitive providers' market share of the provider segment (i.e., high capacity services ultimately purchased by end users) increased from less than six percent to 28 percent.[22] The competitive providers' market share of the transport segment (i.e., high capacity services purchased by carriers for transport) also is growing rapidly, increasing from five percent to 16 percent between the second quarter and the fourth quarter of 1997 alone.[23]

Perhaps the most significant trend statistic is the fact that, between the second and fourth quarters of 1997, competitive providers captured 54 percent of the growth in demand of the provider segment and 42 percent of the growth in demand of the transport segment.[24] Share of growth is the primary indicator of what a competitor's installed-base market share will look like in the future – and competitive providers in the Phoenix MSA have captured a majority share of market growth over the past several years.[25]

U S WEST's rapid reduction in market share is largely the result of facilities build-out on the part of competitive providers in the Phoenix area and their focus on the large business market. U S WEST's share of the facilities-provider market segment is likely to decrease rapidly as customers, particularly the largest carrier customers, migrate traffic onto their own fiber networks.[26]

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[21] Exhibit KAS-1, Kahn and Tardiff Paper at 7. With this rate of growth, demand for high capacity services will double in about 5 ½ years.

[22] Exhibit KAS-2, Quality Strategies Report at 16.

[23] Id. at 14.

[24] Id. at 15.

[25] Id. at 7.

[26] Id. at 31.

Kahn and Tardiff also assert that the recent strong growth in competitive provider market share is likely to continue, and may even accelerate, given the rapid growth of competitive provider market share nationwide.[27] They note that, during the first quarter of 1998, competitive providers added more business lines nationwide than the Regional Bell Operating Companies ("RBOC").[28]

Q. ARE CUSTOMERS IN ARIZONA WILLING TO SWITCH CARRIERS FOR HIGH CAPACITY SERVICES?

A. Yes. Referred to as "demand elasticity", you can measure the willingness and ability of a carrier's customers to switch to a competitive provider, or to otherwise change the amount of services they purchase from the carrier in response to a change in the price or quality of the services. High demand elasticity indicates that customers are willing and able to switch to another service provider in order to obtain price reductions or desired features. It also indicates that the particular service market is subject to competition.[29]

Kahn and Tardiff conclude that the demands of business customers are highly elastic. They agree with the FCC that business customers are sophisticated buyers who typically receive and consider alternative proposals from several vendors. In the case of high capacity services, the primary users of these services – other carriers – have both the incentive and the ability to drive a hard bargain for good prices and levels of service by the threat of going elsewhere.[30] Clearly, the ability of U S WEST's largest carrier customers to migrate high capacity traffic to their own affiliated fiber networks further increases their bargaining ability in the marketplace.

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[27] Exhibit KAS-1, Kahn and Tardiff Paper at 7.

[28] Id. at 8 (citing Statement of Heather Gold, FCC En Banc on State of Local Competition, January 29, 1998 and Salomon Smith Barney "CLECs Surpass Bells in Net Business Line Additions for the First Time," May 6, 1998).

[29] In the Matter of COMSAT Corporation, File No. 60-SAT-ISP-97; IB Docket No. 98-60; File No. 14-SAT-ISP-97; RM-7913; CC Docket No. 80-634, Order and Notice of Proposed Rulemaking ¶ 27 (1998) ("Comsat Reclassification Order"), at ¶ 71.

[30] Exhibit KAS-1, Kahn and Tardiff Paper, (citing Michael E. Porter, Competition in the Long-Distance Telecommunications Market, September 1993). Kahn and Tardiff note that the Commission cited the Porter Study when concluding that demand elasticity considerations supported the conclusion that AT&T was non-dominant in the long distance market. Id.

Moreover, so long as U S WEST is prohibited from offering interLATA services, the ability of competitive providers to offer a complete package of telecommunications services which includes interLATA voice and data services, gives them a "great advantage" over U S WEST in the marketplace.[31]

Q. WHAT IS SUPPLY ELASTICITY?

A. Supply elasticity refers to the ability of suppliers in a given market to increase the quantity of services supplied in response to an increase in price. There are two factors that determine supply elasticities in the market. The first is the supply capacity of existing competitors, because supply elasticities tend to be high if existing competitors have or can easily acquire additional capacity in a relatively short time period.[32] The second factor is the existence of low barriers to entry, because supply elasticities tend to be high if new suppliers can enter the market relatively easily and add to existing capacity.

Q. HOW ELASTIC IS THE SUPPLY OF HIGH CAPACITY SERVICES IN PHOENIX?

A. Quality Strategies has determined that U S WEST's competitors have more than sufficient readily available excess capacity. As a group, these five facilities-based competitors have installed more than 800 route miles of optical fiber in the Phoenix MSA, typically deploying cable consisting of 144 individual fiber elements along the network backbone.[33] With current technology, these competitive fiber networks should be capable of transporting more traffic than the Phoenix area will ever generate. Indeed, equipped as they are today, the competitive fiber backbone networks could handle all of U S WEST's end-user and transport traffic at less than eight percent capacity.[34]

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[31] Id. at 11.

[32] Comsat Reclassification Order ¶ 78.

[33] Exhibit KAS-2, Quality Strategies Report at 6, 27. Exhibit KAS-4 hereto is a map illustrating the existing competitive provider fiber backbone networks in the Phoenix area.

[34] Exhibit KAS-2, Quality Strategies Report at 29.

Q. ARE THERE ANY CONSTRAINTS TO EXPANDING SERVICE TO OTHER U S WEST CUSTOMERS?

A. The only real constraint on expanding service to U S WEST's customers in the near-term is the fact that competitive providers cannot provide service to "off-network" locations without building facilities to connect these sites to their fiber backbone networks. In most cases, this is not an issue at all. Approximately 65 percent of U S WEST's current high capacity demand in the Phoenix area is located within 100 feet of existing competitive provider fiber networks, which means that it is essentially located "on-network." Thus, competitive providers could absorb a majority of U S WEST's high capacity demand almost immediately, incurring only minimal costs.

Moreover, as the attached report prepared by PEI demonstrates, competitive providers would not incur significant costs to extend their fiber networks to absorb the vast majority of U S WEST's current high capacity demand. Specifically, competitive providers in Phoenix can serve the almost 50 percent of U S WEST's high capacity customer locations within 1,000 feet of their existing fiber networks – which accounts for approximately 86 percent of U S WEST's current high capacity demand in the Phoenix area – if they invest $45 million.[35] In addition, competitive providers can serve all of U S WEST's high capacity customer locations within 9,000 feet of their existing fiber networks – which accounts for more than 95 percent of U S WEST's current high capacity demand in the Phoenix area – if they invest approximately $127 million.[36] As wireless technology continues to develop, high capacity fixed wireless alternatives will provide an alternative, low cost means of expanding these competitive fiber backbone networks.[37]

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[35] Exhibit KAS-3, PEI Report at 3. Exhibit KAS-5 hereto is a map showing competitive provider coverage of U S WEST's DS1 equivalent services, including a buffer area within 1,000 feet of existing competitive provider fiber networks.

[36] Exhibit KAS-3, PEI Report at 3.

[37] Id.

1 **Q. CAN YOU PUT THESE INVESTMENT AMOUNTS IN PERSPECTIVE WITH THE CURRENT**
2 **U S WEST REVENUES FOR HIGH CAPACITY SERVICES?**
3 A. Yes. To put these figures into perspective, Kahn and Tardiff observe that U S WEST's current high
4 capacity customers generate about $50 million of revenue annually in direct charges for high
5 capacity facilities.[38] This means that, based on plausible assumptions, the investment necessary to
6 serve all that current business would be about 2.7 times revenues – a multiple "markedly lower"
7 than U S WEST's current investment to revenue multiple of 3.2 for Arizona.[39] The investment ratios
8 required for competitive providers to reach those customers located within 1,000 feet of the
9 providers' existing fiber networks would be even more favorable.[40]
10
11 The investment to revenue comparisons are somewhat hypothetical exercises for considering
12 whether competitive providers would find it economical to expand their networks to serve
13 U S WEST's existing high capacity demand if it were to become available.[41] As such, the
14 comparisons do not take into account the lost economies of scale and density that competitive
15 providers would likely experience if they expand selectively to serve high volume/low cost
16 locations.[42]
17
18 On the other hand, Kahn and Tardiff state that focusing on scale economies sacrificed by targeting
19 customers actually understates the attractiveness of serving current U S WEST high capacity
20 locations, for two reasons.[43] First, because the high capacity market is growing, competitive
21 providers can realize economies of scale by serving the incremental demand in addition to demand

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[38] Id.
[39] Id.
[40] Id.
[41] Id.
[42] Id.
[43] Id. at 14.

captured from U S WEST.[44] Second, it is important to recognize that the revenue figures only reflect payments for the use of the high capacity facilities – as such, they do not take into account the fact that competition increasingly involves the provision of a package of services (i.e., one-stop shopping).[45]

Competitive providers that obtain access to a customer through their high capacity business have a vehicle for obtaining access to other higher margin services. This means that competitors may be willing to under-price their high capacity services in order to "capture" the customer. Taking the net revenues from bundled services into account would make the investment to revenue comparisons "markedly more favorable" according to Kahn and Tardiff.[46]

Q. HOW QUICKLY COULD CURRENT COMPETITORS EXPAND THEIR FACILITIES TO MEET NEW DEMAND?

A. PEI estimates that competitive providers can serve the 50 percent of current U S WEST-served locations that are within 1,000 feet of the providers' existing fiber networks in 18 to 24 months.[47] Kahn and Tardiff find that this time frame is "very significant" and consistent with the time frame envisioned in the Merger Guidelines for determining whether prospective new investments should be counted as a competitive presence disciplining the pricing behavior of firms contemplating a merger.[48]

Although serving those customers beyond 1,000 feet would require additional time, the competitive providers' ability to do so is competitively significant, since this is a real constraint on the ability of

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[44] Id.

[45] Id. For example, ELI's President and Chief Operating Officer Dave Sharkey stated in a news release dated May 4, 1998: "We are witnessing the success of our bundled service strategy, as nearly 60% of our customers purchased multiple products and services." PR Newswire Association, Inc., May 4, 1998.

[46] Exhibit KAS-1, Kahn and Tardiff Paper at 14.

[47] Exhibit KAS-3, PEI Report at 3.

[48] Exhibit KAS-1, Kahn and Tardiff Paper at 14-15

U S WEST to control pricing in the marketplace. If U S WEST were to attempt a significant increase in prices, the competitive providers would begin contacting customers with lower price offers to expand their networks, and the customers in turn would not renew contracts with U S WEST.

Q. IS THE COST OF ENTRY PROHIBITIVE FOR COMPETITORS TO PROVIDE HIGH CAPACITY SERVICE IN PHOENIX?

A. No. The impressive growth of competitive provider's market share in the Phoenix area market for high capacity services demonstrates that the cost of entry is not prohibitive.[49] This is reflected in the tremendous growth in the number and size of competitive providers nationwide. In addition, competitive providers have been attractive takeover targets and are having no trouble attracting large amounts of capital in the financial market. For example, ELI went public in November 1997 and raised $128 million in its equity offering.[50] Kahn and Tardiff note that, in the two years since the passage of the 1996 Act, competitive providers have raised $14 billion of outside capital, whereas total annual investment by incumbent LECs has been about $18 billion.[51]

Q. ARE THERE LEGAL BARRIERS TO ENTRY FOR COMPETITIVE PROVIDERS?

A. No. As mentioned above, there are no legal barriers to entry.[52] Competitive providers have other market entry options in those areas where they choose not to deploy facilities. With the adoption of the 1996 Act, Congress implemented a comprehensive system of market-opening provisions that benefit both facilities-based carriers and pure resellers. This flexibility allows competitive providers to increase their market presence through resale beyond the reach of their existing fiber networks.

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[49] Id.

[50] ELI also has a $400 million credit line, guaranteed by its parent company, Citizen's Utilities, which has an A+ rating with Standard & Poors. Citizen's other securities carry ratings that range from AA- to AA+.

[51] Exhibit KAS-1, Kahn and Tardiff Paper at 16-17.

[52] Compare Comsat Reclassification Order at ¶ 82.

It also allows them to increase their market share more quickly than would be possible solely through expansion of their own networks.

Q. DOES U S WEST HAVE A COST STRUCTURE, SIZE AND RESOURCE ADVANTAGE OVER CURRENT COMPETITORS?

A. No. U S WEST does not enjoy any such advantage in the Phoenix area market for high capacity services. U S WEST faces well-funded and established facilities-based competitors in Phoenix. Publicly available financial and company profile information also demonstrates the size and power of the competitive entrants and leads to the inescapable conclusion that U S WEST is a far smaller player than either AT&T/TCG or MCI WorldCom. It also demonstrates that the other competitors are large well-funded companies, as the following chart demonstrates.

Company	Revenues	Growth	Total Employees
MCI WorldCom	third quarter 1998 revenues were $7.7 billion	16% higher than third quarter 1997	80,000 people
AT&T/TCG	AT&T's third quarter 1998 revenues were $13.65 billion[53]	a 4.3% increase over the same period in 1997	128,000 people
U S WEST	third quarter 1998 revenues were $3.1 billion	a 5.1% increase over the same period in 1997	48,000 people

Q. SINCE THE INTRODUCTION OF COMPETITIVE PROVIDERS HAVE THE PRICES FOR HIGH CAPACITY SERVICES DECLINED?

A. Yes. In fact, when the first competitive providers entered the high capacity services market in the late-1980s, prices for high capacity services were approximately twice their current levels.[54] The fact that competitive activity in the market is accelerating while prices for services are dropping is a strong indication that investors do not believe incumbents have an insurmountable cost advantage in the market.[55]

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[53] At the same time, its $1.9 billion in net income for the quarter was $700 million more than its profits in the third quarter of 1997, an increase of 68%.

[54] Id. For example, U S WEST's rates for DS1 service fell by 43% from 1989 to 1998. Id.

[55] Id. at 17-18.

According to the Kahn and Tardiff Paper, the continued feasibility and vitality of competitive entry in the Phoenix area market for high capacity services is shown by the fact that the rapid expansion of competitive entry has occurred at the same time as incumbent charges for high capacity services have substantially declined.[56]

Q. DOES U S WEST HAVE THE ABILITY TO EXERCISE MARKET POWER IN THE PHOENIX MARKET FOR HIGH CAPACITY SERVICES?

A. No. In particular, Kahn and Tardiff rely on the following market characteristics: (1) U S WEST has a diminishing market share, serving only 30 percent of the retail market and providing barely half of the facilities that serve new demand; (2) customers (e.g., large businesses and other carriers) are highly sensitive to price and other service characteristics; (3) U S WEST's competitors have the ability to expand their facilities and capture U S WEST's existing business, and there are minimal barriers to entry; and (4) U S WEST's size does not provide it an insurmountable advantage.[57]

SERVICE DESCRIPTIONS

Q. WHAT SERVICES IS U S WEST PROPOSING TO DEREGULATE?

A. U S WEST proposes to deregulate the following digital high capacity services: DS1 and DS3 transport services (including Switched Access transport), Frame Relay Service (FRS), ATM Cell Relay Service (ATM CRS), LAN Switching Services (LSS), Transparent LAN Service (TLS), and Megabit Services.

Q. ARE THESE SERVICES NECESSARY TO PROVIDE UNIVERSAL TELEPHONE SERVICE IN ARIZONA?

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[56] Exhibit KAS-1, Kahn and Tardiff Paper at 17.

[57] Id. at 20.

A. No. These competitive high capacity services are not the same as basic telephone services that are necessary to insure universal service objectives in Arizona.

Q. DO YOU HAVE ANY EVIDENCE THAT COMPETITORS ARE PROVIDING THESE, OR CAN PROVIDE SIMILAR SERVICES, IN ARIZONA?

A. Yes. Attached in Exhibit KAS-6 are examples of web pages and public announcements about our competitor's abilities and willingness to provide high capacity services in Arizona. In addition, our sales organization in Arizona continues to receive copies of competitive bids from our customers inquiring if we can meet or beat the competitors price or terms and conditions. Several examples have also been included in Exhibit KAS-6. U S WEST is unable to obtain market share information such as the number of customers or circuits sold by competitors because it is not publicly available.

Q. WHAT IS DS1 SERVICE?

A. U S WEST DS1 Service provides for the two-way transmission of 1.544 Mbps digital signals, on a point-to-point basis only. DS1 Service can be provisioned on copper, fiber, or other suitable facilities. DS1 Service may be used for the transmission of voice, data, and video signals, or any combination thereof. DS1 Service is provided between two customer designated premises, between a customer designated premises and a company serving wire center, or between company serving wire centers.

DS1 transport also provides the transport facilities for Primary Rate Integrated Digital Services Network (ISDN) service, Digital Switched Service (DSS) and Switched Access Transport. U S WEST is not requesting deregulation of the switching and trunking portions that make these unique services, but rather the common underlying DS1 transport facilities.

Q. DO YOU HAVE ANY EVIDENCE THAT COMPETITORS ARE CAPABLE OF PROVIDING DS1 SERVICES?

A. Yes. Exhibit KAS-2 demonstrates that many providers in the Phoenix MSA have DS1 services. In addition, attached in Exhibit KAS-6 is publicly available marketing information that shows several competitors in Arizona are providing DS1 service. For example, AT&T/TCG, ELI, GST and MCI WorldCom all advertise the availability of DSI services. The AT&T/TCG web page describes a wireless DS1 alternative called OmniWave Services. In addition, in Exhibit KAS-6, are examples of competitive bids that have been provided to U S WEST customers by various companies about their ability to provide DS1 service[58]

Q. WHAT IS DS3 TRANSPORT SERVICE?

A. U S WEST DS3 Service provides a high capacity channel for the transmission of 44.736 Mbps isochronous serial data having a line code of bipolar three zero substitution (B3ZS). DS3 Service is provided between customer designated premises, between a customer designated premises and a Company Hub or between Company Hubs. DS3 Service is available utilizing an electrical or optical interface.

Q. DO YOU HAVE ANY EVIDENCE THAT COMPETITORS ARE CAPABLE OF PROVIDING DS3 SERVICES?

A. Yes. Exhibit KAS-2 discusses DS3 providers in the Phoenix MSA. In addition, attached in Exhibit KAS-6 is publicly available marketing information that shows several competitors in Arizona are providing DS3 service. For example, AT&T/TCG, ELI, GST and MCI WorldCom all advertise the availability of DS3 services. In addition, the AT&T/TCG web page describes a wireless DS3 alternative called OmniWave Services.

[58] DS1 and T1 service are technically the same service.

Q. WHAT IS FRAME RELAY SERVICE?

A. Frame Relay Service (FRS), often referred to as "fast packet", is a modified form of packet switching technology. It is used for high-speed data transfer among Local Area Networks (LAN) and host computers at speeds of 56 kbps, 1.544 Mbps, and 44.736 Mbps. FRS uses the public data network to create "virtual private lines" that connect multiple sites.

FRS differs from conventional packet switching in that it relies on Customer Premises Equipment (CPE) to perform the functions of error recovery and flow control between each node. In contrast, conventional packet switching performs the error recovery and flow control functions. The result of FRS performing these functions is higher throughput and lower delay because much of the network's overhead is eliminated.

FRS ports are the physical entry points for Access Links. They are also the originating and terminating points for Permanent Virtual Circuits (PVCs). PVCs are provisioned on either 56/64 Kbps, 1.544 Mbps, or 44.736 Mbps ports, depending on the customer's data networking requirements.

Q. DO YOU HAVE ANY EVIDENCE THAT COMPETITORS ARE CURRENTLY PROVIDING FRAME RELAY SERVICE?

A. Yes. Attached in Exhibit KAS-6 is publicly available marketing information that shows several competitors in Arizona are providing Frame Relay Service. For example, AT&T/TCG, ELI, GST, MCI WorldCom and e.spire all advertise the availability of Frame Relay services. Specifically, GST and e.spire provide Frame Relay Service in Tucson. In addition, Exhibit KAS-6 contains an example of WinStar's offer to provide a private Frame Relay network between Yuma, Phoenix and Tucson.

Q. WHAT IS ATM CRS?

A. U S WEST's ATM CRS is a connection-oriented communications service that uses Asynchronous Transfer Mode (ATM) technology. ATM CRS provides customers with a fast-packet (cell) switched service that responds to customer needs for high speed, low-delay information transfer to support applications that require near-real-time mixed media (data, video, image, voice) communications among multiple locations. ATM CRS allocates band width to applications and users as needed. This allocation supports "bursty" applications that place high short-term demands on the network but do not justify dedicated lines, and customers are billed only for the capacity they use.

Q. DO YOU HAVE ANY EVIDENCE THAT COMPETITORS ARE CURRENTLY PROVIDING ATM SERVICE?

A. Yes. Attached in Exhibit KAS-6 is publicly available marketing information that shows several competitors in Arizona are providing ATM service. For example, AT&T/TCG, ELI, and MCI WorldCom all advertise the availability of ATM services in Phoenix. In addition, AT&T, ICG and e.spire provide ATM service in Tucson.

On a national level, Sprint, AT&T/TCG and MCI WorldCom have the highest market share, ranging from 17% to 26% of total revenues. MCI WorldCom and Sprint have the highest number of ATM CRS connections, which represent 29% and 14% of total connections, respectively. U S WEST estimates that it has approximately 2% of both ATM revenues and connections.

Q. WHAT IS LAN SWITCHING SERVICE (LSS)?

A. LSS is a metropolitan-area and wide-area LAN interconnection service, which utilizes ATM technology to provide customers with native speed LAN interconnection. LSS provides a specific amount of bandwidth and supports both point-to-point and multipoint (shared) connectivity of Ethernet connections at 10 Mbps, Fast Ethernet Lite at 45 Mbps, and Fast Ethernet at 100 Mbps.

LSS also provides token Ring LAN interconnection at 16 Mbps. LSS is provided over 45 Mbps and 155 Mbps fiber optic facilities. LSS can only transmit data at this time.

Q. DO YOU HAVE ANY EVIDENCE THAT COMPETITORS ARE CAPABLE OF PROVIDING LSS SERVICE?

A. Yes. Attached in Exhibit KAS-6 is publicly available marketing information that shows several competitors in Arizona are providing LAN switching and ATM service. Therefore, it is reasonable to assume they can provide a replacement product for the U S WEST LSS service. For example, AT&T/TCG, ELI, and MCI WorldCom all advertise the availability of ATM and LAN switching services.

Q. WHAT IS TRANSPARENT LAN SERVICE (TLS)?

A. Transparent LAN Service (TLS) is a high speed (1.544, 4, 10 or 16 Mbps), shared fiber optic transport service for the interconnection of Local Area Networks (LANs). TLS serves as a basic LAN extension for either Token Ring or Ethernet LANs. TLS provides a virtual private circuit that utilizes public transport.

It is provided only over fiber optic facilities, and can be provided on a point-to-point or, in certain instances, multipoint basis, depending on how the data links are used by the customer. TLS has working (primary) and protect (secondary) pairs of fibers for reliability. Should the primary fiber facilities fail, the service automatically switches to the secondary path fiber facilities in order to maintain a near continuous flow of data between locations.

Q. DO YOU HAVE ANY EVIDENCE THAT COMPETITORS ARE CAPABLE OF PROVIDING TLS SERVICE?

A. Yes. Attached in Exhibit KAS-6 is publicly available marketing information that shows several competitors in Arizona are providing TLS service. For example, AT&T/TCG, ELI, and MCI

WorldCom all advertise the availability of TLS services. In addition, the studies in the Phoenix area indicate that many competitors have fiber rings already installed.

Q. WHAT IS MEGABIT SERVICE?

A. MegaBit Service is the umbrella name for U S WEST's family of managed services delivered to a subscriber location on DSL (Digital Subscriber Line) technology. MegaBit Service provides the capability for simultaneous voice and high-speed data services over a single copper wire pair. (Data is separated at the serving central office and then connected to a high-speed fiber network and delivered to the host destination.)

MegaBit Service involves two service categories: MegaCentral and MegaSubscriber. These two categories correspond to the "hub" and "spoke" nature of the service architecture. The MegaCentral location is the hub (or host), and each MegaSubscriber is a spoke. One MegaCentral location will serve multiple MegaSubscribers. Each of the spoke connections must be associated with a host.

Q. CAN YOU PROVIDE MORE DETAIL ABOUT MEGASUBSCRIBER SERVICE?

A. Yes. MegaSubscriber service uses DSL technology to transport a high capacity data stream over a single pair of copper wires along with Plain Old Telephone Service (POTS). A customer must have or purchase a POTS line, and MegaBit MegaSubscriber service rides on top of the POTS line; i.e., MegaBit MegaSubscriber Service does not include a POTS line.

Q. CAN YOU PROVIDE ADDITIONAL DETAIL ABOUT MEGACENTRAL SERVICE?

A. Yes. MegaCentral is the "hub" of the "hub and spoke" network. As previously discussed, MegaSubscriber is the spoke and each MegaSubscriber connection must be matched with a MegaCentral connection.

The MegaCentral service is provided to small businesses, corporations or Internet Service Providers (ISP), allowing them to aggregate data streams from many MegaSubscribers onto a single high-speed data connection. An example of such an arrangement is a group of telecommuters that would each have a spoke network connection that is associated with the corporation's hub connection. MegaCentral customers will have the option of purchasing multiple MegaCentral links that may be used to increase available bandwidth, for load sharing functions, or as backup connectivity in the case of primary link failure.

Q. DO CUSTOMERS HAVE ALTERNATIVE SERVICES AVAILABLE TO MEET THEIR NEEDS?

A. Yes. Customers have alternatives from both U S WEST and other competitors. Alternatives include: ISDN service, Frame Relay Service, ATM CRS, private line transport services. In Phoenix specifically, Speed Choice is heavily promoting a wireless broadband alternative to U S WEST's Megabit service. Additionally, cable modem placement is growing. Cable modems are becoming realistic alternatives for business and residential customers, and are among the main competitors to data services offered on DSL technology.

Q. WHAT ARE CABLE MODEMS?

A. Cable modems are data devices using embedded cable television infrastructure. The coaxial cable coming into the home has the potential of supporting up to 750Mhz of broadcast media, data, audio etc. Many of the cable operators have elected to set aside one or two channels within the distribution infrastructure to support the use of data modems. For example, in Exhibit KAS-6, is a copy of the Cox Communications' web site promoting their new cable modem services "Cox @ Home" and "Cox @ Work", as now available in parts of Phoenix.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. _____

EXHIBITS OF

KAREN A. STEWART

U S WEST COMMUNICATIONS

JANUARY 8, 1999

INDEX OF EXHIBITS

DESCRIPTION	EXHIBIT
Kahn and Tardiff Paper	KAS-1
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Kahn and Tardiff Paper

ECONOMIC EVALUATION OF HIGH CAPACITY COMPETITION IN PHOENIX

Alfred E. Kahn and Timothy J. Tardiff

EXECUTIVE SUMMARY

U S WEST Communications is requesting, under Section 10 of the Telecommunications Act of 1996, that the Federal Communications Commission forebear from regulating it as a dominant carrier in its sale of high capacity services in the Phoenix metropolitan area. In support of its Petition the Company has asked us to assess its market power in the offer of these services in that area. In performing this analysis, we rely on information about that market obtained from studies performed by others (Quality Strategies and POWER Engineers), on data provided by the Company, and on our own primary and secondary research on this and related markets.

Following the approach the FCC has previously used to assess market power for other services, we conclude that the market for high capacity services in the Phoenix area fully exhibits the indicia of competition that the Commission has prescribed. In particular, (1) U S WEST has a diminishing market share—indeed, it serves only 30 percent of the retail market—and is barely providing one-half of the facilities that serve new demand; (2) customers are highly sensitive to price and other service characteristics; (3) U S WEST's competitors have the ability to expand their capacity sufficiently to take over a major share of the market currently served by U S WEST and there are minimal barriers to entry; and (4) U S WEST's size does not confer on it an insurmountable competitive advantage.

August 14, 1998

U S WEST's lack of market power signifies that competition itself, without dominant firm regulation, is sufficient to limit its ability to impose anticompetitive prices and other conditions of service. In light of these developments, the costs of maintaining dominant firm regulation in this market clearly exceed whatever benefits continued regulation could possibly confer.

I. INTRODUCTION

U S WEST Communications is requesting, under Section 10 of the Telecommunications Act of 1996, that the Federal Communications Commission forebear from regulating it as a dominant carrier in its sale of high capacity services in the Phoenix metropolitan area. In seeking nondominant status for these services, the Company argues that competitive entry, along with the competition to which it is already subject, is sufficient to constrain its ability to charge prices above competitive levels and, therefore, the costs of continued dominant carrier regulation far outweigh the benefits.

U S WEST has asked us to assess its market power in the offer of these services in Phoenix. In performing this analysis, we rely on information about that market obtained from studies performed by others (Quality Strategies and POWER Engineers), on data provided by the Company, and our own primary and secondary research on this and related markets. We follow the framework the FCC has used in determining nondominant status in other situations.[1] We conclude that competition in this particular market is sufficiently strong to constrain U S

WEST's ability to control prices and other terms and conditions of service, and that continuing dominant-firm regulation of its high capacity services would be anti-competitive and injurious to consumers.

II. THE FCC'S APPROACH TO MARKET POWER ASSESSMENT

The FCC employs standard economic concepts in its assessment of a firm's market power.[2] It first defines the relevant product and geographic market, taking into account both demand and supply substitution. It then determines whether a firm currently regulated as a dominant carrier still possesses monopoly power within that market, by examining four specific measures:[3] (1) market share, (2) demand elasticity, (3) supply elasticity and (4) the cost structure, size and resources of the putatively dominant firm. We proceed to analyze each of these in turn.

A. Market Definition

Services provided to customers with usage sufficiently great to be economically served with high capacity facilities[4] define the relevant product market.[5] These customers would be

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[1] See, for example, *Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier*, October 12, 1995 ("AT&T nondominance order") and *Policies and Rules for Alternative Incentive Based Regulation of Comsat Corporation*, IB Docket No. 98-60, April 24, 1998.

[2] Cf., e.g., the methods employed by the antitrust agencies for defining markets when analyzing proposed mergers. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines*, April 2, 1992.

[3] These measures are similar to those described in W.M. Landes and R.A. Posner, "Market Power in Antitrust Cases," *Harvard Law Review*, 1981.

[4] These include DS-1 or higher capacity facilities.

mid-sized to large business end-users,[6] carriers using high capacity transport facilities, and resellers. Services provided over lower-capacity facilities are not in the same product market and are not encompassed by the U S WEST petition: in terms of the familiar standard of the *Merger Guidelines*, customers of these services would not shift their demands to high capacity facilities in response to a "small but significant" increase in the price of their current services, because the monthly cost of hooking them up for that kind of access is as much as six to seven times their current basic monthly charges.[7] Because, for this reason, high-capacity access to large users and low-capacity access to small users are not substitutable on the demand side, the smaller users are in a separate product market.[8]

In terms of supply substitutability, the market clearly embraces all local exchange companies, incumbent and competitive, as well as competitive access providers. There seems no reason to doubt that all of them are capable of providing service to the high-capacity market.

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[5] Over ten years ago, one of us applied a similar analysis to conclude that high capacity services were competitive in New York City. J.A. Hausman, T.J. Tardiff, and H. Ware, "Competition in Telecommunications for Large Users in New York," in National Economic Research Associates, *Telecommunications in a Competitive Environment*, Proceeding of the Third Biennial Telecommunications Conference, Scottsdale, Arizona, April 1989, pp. 1-19. Our study was based on testimony presented to the New York Public Service Commission. At the conclusion of that case, the Commission ordered that, with the implementation of collocation and the unbundling of switching and transport, New York Telephone be granted a wide range of pricing flexibility—the ability to raise rates by 25 percent annually and to lower them to incremental cost—for its high capacity dedicated services. New York Public Service Commission, Proceeding on Motion of the Commission to Review Regulatory Policies for Segments of the Telecommunications Industry Subject to Competition, Case 29469, Opinion No. 89-12, May 16, 1989. While New York was the first city in which local exchange competition took root, competition is more prevalent in Phoenix today than it was in New York when we performed our study.

[6] For ultimate customers, the distinction between mid to large businesses and smaller users corresponds roughly to locations with enough demand to justify a PBX.

[7] U S WEST's current price for a DS-1 facility is about $270 per month.

[8] *Horizontal Merger Guidelines*, Section 1.11.

A practical delineation of the geographic scope of the market for high capacity facilities from the supply side is the metropolitan area. New entrants often announce the availability of their services on this basis. In addition, this tends to be the area within which a provider can expand in a timely fashion to offer services to a growing number of locations. For this particular examination, POWER Engineers (PEI) have shown that competitive local exchange carriers in Phoenix can economically expand to serve almost half of the locations of U S WEST's present high-capacity customers within two years.[9]

B. Market Power Assessment

In this section, we undertake the four assessments performed by the FCC.

1. Market Share

According to Quality Strategies,[10] five competitive providers,[11] all of them with regional or national presence, have entered the high-capacity market in Phoenix since 1994—MFS-WorldCom, TCG, ELI, GST, and MCIMetro. MFS and TCG are the oldest and largest CLECs in the country. With its proposed merger with MCI, MFS-Worldcom would become affiliated

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[9] POWER Engineers, *Phoenix Fiber Study*, Prepared for U S WEST, August 13, 1998. Specifically, PEI estimated the cost of expanding CLEC networks to serve all U S WEST locations within 9,000 feet of those networks. These locations account for approximately 95% of all U S WEST's current high capacity demand in the Phoenix area.

Demand tends likewise to be location-specific. Although the size of the consumer base in the several metropolitan areas of the country (indeed, the world) tends to be responsive to, among other things, the availability and cost of high-tech telecommunications facilities, we would not contend that this source of demand elasticity at any particular location sufficiently constrains possible monopoly power at that location to justify broadening the definition of the market to include suppliers of comparable services elsewhere: we accept the obligation to demonstrate that competitive sources of supply must be sufficiently available, both actually and potentially, in Phoenix itself to justify our support for the U S WEST petition.

[10] High-Capacity Market Study—Phoenix MSA, Prepared for U S WEST, August 7, 1998.

with the second largest long-distance carrier. Similarly, AT&T recently completed its acquisition of TCG, the second largest national CLEC. These transactions involve the merger of the purchasers of approximately half of U S WEST's high capacity services (e.g., carriers purchasing access) in Phoenix with suppliers that compete directly with U S WEST. It would be difficult to conceive of a more substantial consequent diminution of whatever market power that company might previously have enjoyed.

The Quality Strategies report measured market share in a number of ways.[12] In terms of overall high capacity services, U S WEST provides 77 percent of total facilities—whether directly to customers or to other carriers—CLECs the other 23 percent. U S WEST's share is lower than that for facilities provided to end users (72 percent), but higher for IXC transport (84 percent).

What these still-high market shares conceal is the fact that competitors of U S WEST have already taken over the preponderant share of the retail market—both using U S WEST's facilities and, as we will point out, increasingly using their own. In terms of direct sales to retail end users, U S WEST's share of the high-capacity market is below 30 percent, according to this same study.[13]

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[11] For purposes of our discussion, we do not distinguish between competitive local exchange carriers (CLECs) and competitive access providers (CAPs).

[12] Unless otherwise indicated, its estimates are for the fourth quarter of 1997.

[13] A large proportion of U S WEST's high-capacity facilities are provided to other carriers, who then resell the capacity to end use customers. For example, interexchange carriers, such as AT&T, MCI and Sprint, use U S WEST special access facilities when providing certain services to their high-volume customers.

In addition to the level of the current market share of competitive providers, recent changes in that share as well as growth in the market overall[14] are germane to the assessment of market power. Both of these strongly suggest that the Phoenix high capacity market is increasingly competitive. The market overall has been growing recently at about 13 percent annually.[15] Expansion of the CLECs' business has been even more rapid. During the period from the fourth quarter of 1994 to the fourth quarter of 1997, their share of facilities provided to end users increased from 6 percent to 28 percent; and their share of total transport carriage has grown much more dramatically—from 5 to 16 percent in the half-year between the second and fourth quarters of 1997.[16] This means, as a matter of simple arithmetic, that their shares in the *incremental* business in this rapidly growing market must have been much greater than that. According to the Quality Strategies report (p. 15), CLEC facilities are getting 54 percent of the growth in demand of end-users (whether directly or through a reseller), and they are providing 42 percent of the growth in transport with their own facilities.

The strong recent growth in CLEC sales and market share is likely to continue and may even accelerate. While we do not have Company-specific data for Phoenix, CLECs expect to more than double their sales nationally in 1998, with the bulk targeted, as heretofore, at

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[14] In general, the more rapidly a market is growing, the easier entry is likely to be, other factors being equal. See, for example, G.J. Stigler, *The Theory of Price*, Fourth Edition, New York: McMillan, 1987, pp. 209-210.

[15] This rate of growth would produce a doubling of demand in about 5½ years.

[16] These growing shares in a growing market of course imply an even higher growth rate for CLEC volumes. CLEC circuits provided to end users grew by about one-third during 1997, while the CLEC transport volume *almost tripled* in the last half of 1997.

business customers. In fact, during the first quarter of 1998, CLECs added absolutely more new business lines in the U.S. than the RBOCs.[17]

A comparison of the Phoenix market share information with the situation the FCC considered when it granted AT&T nondominant status for interstate long-distance is informative. The FCC reported a market share of about 60 percent for AT&T in 1993.[18] Over the previous five years it had fallen by fewer than 10 percentage points.[19] While AT&T's revenues were essentially flat over the 1988 to 1993 period, the overall market was growing by about 5 percent per year and the revenues for carriers other than AT&T at about 15 percent annually.[20]

This comparison of markets at the time of their respective nondominance investigations thus reveals that while U S WEST's current market share at the wholesale, facilities level is higher than AT&T's at the time when the FCC found it non-dominant, its share at the retail level is much much lower: we doubt there would be economists prepared to refer to a firm with 30 percent of a retail market as "dominant." Moreover, at both wholesale and retail levels, the shares and the volumes of business of U S WEST competitors are growing at a considerably more rapid rate than were those of AT&T's competitors at that time. Since we believe the consensus of economic opinion would be to place greater emphasis on changes in market shares over time and shares in incremental business than their absolute levels, we believe the

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[17] See statement of Heather Gold, *FCC En Banc on State of Local Competition*, January 29, 1998 and Salomon Smith Barney "CLECs Surpass Bells in Net Business Line Additions for the First Time," May 6, 1998.

[18] AT&T nondominance order, par. 40.

[19] Federal Communications Commission, *Trends in Telephone Service*, February 1998, Table 11.1.

[20] *Ibid.*, Table 11.6.

consensus conclusion would be that U S WEST has much the stronger of the two cases for its claim of a lack of market power in the Phoenix high capacity market.

In fact, market shares considerably smaller than that of the CLECs in Phoenix have been considered competitively significant. For example, in its AT&T nondominance order, the FCC adduced in support of its conclusion (par. 62) the fact that long-distance resellers, with a market share of about 12 percent, could attract new customers sufficiently to constrain AT&T's ability to charge supracompetitive prices. Hubbard and Lehr go even further in concluding that these resellers had sufficient market presence to discipline AT&T, MCI and Sprint, combined.[21] Of course, the 1996 Telecommunications Act explicitly promotes this form of competition via its mandatory unbundling and resale provisions.

2. Demand Elasticity

In granting nondominant status to AT&T, the FCC observed that the demands of business customers are highly elastic, because they are sophisticated buyers who typically receive and consider alternative proposals from several vendors.[22] That observation clearly applies at least equally to the segment of the business customer market that purchases high capacity services and facilities—medium to large businesses and other carriers.

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[21] Affidavit of R. Glenn Hubbard and William H. Lehr, on behalf of Western Electric Company, Inc., and American Telephone and Telegraph Company, United States District Court for the District of Columbia, Civ. No. 82-0192 (HHG), filed December 5, 1994, Attachment 1: "An Analysis of Competition in U.S. Long-Distance Telephone Service," pp. 5-6. While we have disagreed with Hubbard and Lehr about the adequacy of competition in the long-distance business in protecting small residential purchasers of long-distance services, we have not disagreed at all about the effectiveness of competition in serving large customers and in appraising the role of resellers in that competition.

[22] AT&T nondominance order, par. 65.

In support of its motion for nondominant status, AT&T submitted an assessment by Professor Michael Porter of the competitiveness of the long-distance market.[23] He found that business customers have considerable negotiating power because of their sophisticated knowledge of telecommunications, their use of network outsourcers and their ability to provide their own networks. These factors are even more powerful in the case of high capacity services, because among the primary users of these services are other carriers that have both the incentive and the ability to drive a hard bargain for good prices and service by threatening to go elsewhere. One need look no further than the alliances between the major IXCs and CLECs (such as Worldcom/MCI/MFS, AT&T and TCG) to observe the ability of these buyers to seek good deals and/or self-provide by shifting their patronage to their affiliated CLECs.[24]

These factors are further reinforced by the already large share of U S WEST's competitors in the *retail* market. It means that even though they rely heavily on U S WEST actually to provide the high capacity facilities that they then resell to ultimate customers, they are not in this market handicapped by the typical inertia of residential customers, their reluctance to drop their familiar, historical supplier and shift to an unfamiliar retail competitor.

As for the elasticity of substitution between the offerings of U S WEST and its challengers, the rapid growth in the latter companies' share of the business speaks eloquently in

[23] Michael E. Porter, "Competition in the Long-Distance Telecommunications Market," September 1993. The AT&T nondominance order, par. 64, cited this study when concluding that demand elasticity considerations supported the conclusion that AT&T is nondominant in long-distance.

[24] Quality Strategies, pp. 23-24.

support of the expressions of confidence by CLECs, with which the trade press abounds[25]—a confidence confirmed by a disinterested observer:

> CLECs will be hitting their stride as marketing machines during 1998. ...If 1996 was a year of regulatory maneuvering, and 1997 has been a year of preparation, then 1998 will surely be the first year in which CLECs demonstrate their ability to take market share away in a big way.[26]

The CLEC's ability to take market share from incumbent providers is based, in part, on their offering of sophisticated new services that use these high capacity facilities,[27] bundled into a complete offering of telecommunications services. Incidentally, as this last consideration suggests, the CLECs have one great advantage over RBOCs like U S WEST, so long as the latter companies continue to be subject to the prohibition of their offering inter-LATA services, a restriction from which the CLECs are of course free.

3. Supply Elasticity

The analysis of supply elasticity involves an appraisal of (1) the capability of current competitors that are considered nondominant to expand operations to absorb demand currently served by the incumbent carrier and (2) the presence or absence of entry barriers.[28]

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[25] For example, the CEO of Intermedia boasted that "CLECs have proven they can easily take market share from incumbents." *Telco Business Report*, December 8, 1997, pp. 1-3.

[26] *Ibid.*

[27] For example, e spire (formerly ASCI), a CLEC operating in the southeastern United States, recently announced a high capacity product, targeted to small to medium business, which in the words of one of its executives is "the [RBOCs] worst product nightmare." *Telephony*, March 30, 1998, p. 7. While e spire is not operating in Phoenix, the types of products that will be successful in the market are likely to be similar across regions. Successful introduction of a new product by a CLEC in one region can be expected to be imitated by other CLECs in other regions.

[28] AT&T nondominance order, par. 57. The FCC focused on the first of these in its decision, apparently because it considered the capacity of the existing competitors alone sufficient.

a. Ability of existing CLECs to expand

The best indicator of the ability of existing CLECs to expand is the fact that they have in fact done so tremendously, both in Phoenix, as we have already described, and nationwide, as we will describe in the next section. The market itself has demonstrated that it is indeed economically feasible for these firms to capture demand, both new volumes and demand currently served by U S WEST, if that Company's performance failed to meet competitive standards.

The question: if customers wanted to shift from U S WEST in response to a price increase, would existing CLECs find it economical to serve them?—can also be answered hypothetically. The studies performed by Quality Strategies and PEI provide two measures that shed light on the subject. First, Quality Strategies estimated that the existing backbone networks of the five facilities-based Phoenix CLECs have more than *ten times* the capacity needed to accommodate the current demand for U S WEST's high capacity services.[29] Further editorial commentary on the significance of this finding for the question of U S WEST's "dominance" would surely be superfluous.

Of course, customers would have to be linked to one or another of those backbone networks if a CLEC were to serve them. To this end, PEI performed a detailed study of the cost of providing that linkage to U S WEST's customers, at successive distances from the CLEC facilities.[30] It revealed that about one-half of U S WEST's high capacity customer

[29] Quality Strategies, p. 29.

[30] The cost model developed by PEI is described in detail in its report: it identified routes between customers and the CLEC networks and then estimated the cost of providing fiber optic cable, the associated support structures and electronics over them.

locations are within 1.000 feet (under 0.2 miles) of a CLEC network and to make such connections to all these customers would require an investment of $45 million and would take no more than two years. To serve all locations within 9.000 feet of CLEC networks would require a total of $127 million and no more than five years.

To put these estimates into perspective, we observe that U S WEST's present high capacity customers generate about $50 million of revenue annually in direct charges for the high-capacity facilities—in effect, for the "dial tone" alone. This means that the investment necessary to capture all that current business would be about 2.7 times revenues—a multiple markedly lower than U S WEST's present investment to revenue multiple of 3.2 for Arizona.[31] Under plausible assumptions, the investment ratios required for CLECs to reach customers located within 1,000 feet of their present networks would be even more favorable.[32]

Of course, these investment to revenue comparisons must be viewed in the context of the hypothetical exercise associated with this attempt to assess supply elasticity: would existing CLECs find it economic to expand to serve existing demand if it were to become available. In reality, these CLECs would most likely expand selectively, in an attempt to target high volume/low cost locations. On the one hand, such targeting could introduce some diseconomies, because it would involve serving less than the total volume considered in PEI's calculations, and thereby sacrifice some economies of scale and density.[33] For example, if

[31] ARMIS data disclose investment (total plant in service) of about $4.31 billion and revenues of about $1.35 billion in 1996.

[32] Almost half of U S West's locations are within 1,000 feet of CLEC backbone networks. These locations account for approximately 86 percent of U S West's high-capacity business (i.e., in terms of DS1 equivalents).

[33] In particular, PEI's study implies three types of scale economies. First, there are cost savings when support structures such as poles and trenches can be shared among several locations. Second, the fiber cable itself is a

CLECs captured only one-half of the volumes at U S WEST's existing locations. the investment to cost ratio for locations within 1,000 feet would be 3.1.[34]

On the other hand, focusing on scale economies sacrificed by targeting customers can only understate the attractiveness of CLECs serving current U S WEST locations. for two reasons. First, because the high capacity market is growing, there will be economies of scale in serving both demand captured from U S WEST and the incremental demand. Second. it is important to recognize that the foregoing revenue figures are the payments by subscribers for the use of the high-capacity facilities only: they are equivalent to the flat monthly fee for "dial tone" service alone. As such, they do not account for the fact that competition is increasingly over a package of services: access to a customer becomes the vehicle for selling services with even higher margins. Taking these net revenues into account would make the comparison of the required investment in high capacity facilities to the revenues it would produce markedly more favorable than is suggested by our previous calculations.

The timeliness with which current competitors can expand their facilities to meet new demand is also important in assessing supply elasticity. In this connection, the estimate that CLECs can serve the 50 percent of current U S WEST-served locations that are within 1,000 feet of CLEC networks in 18 to 24 months is very significant. This two year horizon is consistent with the time frame envisioned in the *Merger Guidelines* in determining whether

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fixed cost for each location, because the same fiber can serve all volumes in the relevant range. Third, there are economies of scale in the electronics, i.e., electronic costs increase less than proportionately as additional volume is added at a location.

[34] We chose the 50 percent assumption on the basis of the observation that CLECs are now capturing about one-half of new volumes. Our ratio assumes that their share would be spread evenly over all locations, so that CLECs would still have to build facilities to all of them.

prospective new investments should be counted as a competitive factor disciplining the pricing behavior of firms contemplating a merger.[35]

Even though taking on customers beyond 1,000 feet would require additional time, the CLECs' ability to do so is competitively significant. As the FCC correctly observed in its AT&T nondominance order,

> The issue, however, is not whether Sprint and MCI could and should expand their networks so they can serve all of AT&T's customers within a short time frame. Rather, the issue is whether, in the short term, Sprint and MCI have sufficient available excess capacity to add a significant number of new customers. The evidence shows that Sprint and MCI can add significant numbers of new customers with their existing capacity and add incrementally to this capacity as new customers are added to their networks.[36]

b. Barriers to entry

The impressive growth of CLECs demonstrates that barriers to local exchange entry are obviously not prohibitive.[37] Although high capacity entry came later to Phoenix than other metropolitan areas, CLECs there appear to be catching up to the pace elsewhere. According to Quality Strategies, two CLECs entered in 1994 (ELI and TCG), MFS in 1995, MCI in 1996, and GST in 1997.[38]

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[35] *Merger Guidelines*, par. 3.2.

[36] Par. 60. The FCC also concluded that resellers could expand capacity in response to supracompetitive pricing by AT&T (par. 62)

[37] Although much of the available data on CLEC growth is at the national level and for all local exchange services, it is clear that these firms are focusing on high capacity services. For example, Heather Gold reported that the CLECs had created "the nation's first digital local networks...in direct response to increased customer needs for broadband capabilities and advanced telecommunications solutions," *op .cit.*

[38] Quality Strategies, pp. 19-22 and p. 25.

Nationally, there has been tremendous growth in the number and size of CLECs. Currently, there are over 100 of them[39] and they are adding customers at an impressive rate. For example, Salomon Smith Barney reported that CLECs added 75.000 new business lines in the fourth quarter of 1996—sixty-four percent of that total by the "Big 2" (TCG and MFS), 20 percent by 12 other smaller, explicitly identified carriers, and the other 16 percent by an unidentified group. By the first quarter of 1998, the total CLEC volume of new lines had increased to about 500,000, with the "Big 2" accounting for only one-third, the next 12 for 50 percent, and the remaining small LECs for the remaining one-sixth[40]—testifying to a marked decrease in concentration even among these challengers of the ILECs. Clearly, the market opportunities for CLECs are not only expanding but expanding disproportionately rapidly for the newer entrants among them.

Similarly, CLECs are having no trouble attracting large amounts of capital. These funds have come both from other carriers in the form of acquisitions and from the capital market. For example, over the past two years, WorldCom acquired two CLECs, MFS and Brooks, for a combined price of $16.4 billion—an amount almost identical to what SBC paid to acquire Pacific Telesis. In the first half of this year alone, AT&T has acquired TCG at a cost of $11 billion and recently announced its intent to acquire TCI at a cost of $48 billion. In the two years since the passage of the Telecommunications Act in 1966, CLECs have raised $14 billion

[39] Heather Gold, *op. cit.*

[40] Salomon Smith Barney, *op. cit.*

of outside capital.[41] In comparison. The most recent data reported to the FCC show total annual investment by the ILECs has been about $18 billion.[42]

In addition, the availability of investment capital has been unequivocally demonstrated. The over $14 billion that CLECs have raised since the passage of the 1966 Act—over a period of less than two years—was six times the amount of capital raised in the four years before its passage.[43]

4. Cost Structure

In the AT&T nondominance order, the FCC was concerned that AT&T's size relative to other carriers might give it a significant advantage in terms of scale economies and access to capital. The same question must be raised in the present context. The record we have already summarized supplies the definitive answer: investors are obviously satisfied that incumbents do not enjoy advantages sufficient to make continuing—indeed growing—investment in CLECs unattractive.

What is both highly satisfying from the standpoint of consumers and reassuring about the continued feasibility and vitality of competitive entry is the fact that this rapid recent expansion of the CLECs has occurred at the same time as the charges by incumbents for high capacity services have declined substantially. When the first CLECs entered in the mid- to late 1980s, these prices were over twice their current levels.[44] That CLEC activity is accelerating at

[41] Statement of Heather Gold, *op. cit.*

[42] Calculated from data reported in the FCC's *Statistics of Communications Common Carriers*.

[43] Heather Gold, *op. cit.*

[44] For example, U S WEST's rates for DS-1 capacity fell by 43 percent between the end of 1989 and the beginning of 1998.

lower price levels is strong indication that investors are not overly concerned about insurmountable cost advantages of the incumbents.

III. THE COST OF MAINTAINING DOMINANT REGULATION OF U S WEST'S HIGH CAPACITY SERVICES

In the AT&T nondominance order (e.g., par. 32), the FCC describes graphically the large social costs of continued asymmetrical regulation: (1) the longer tariff notices imposed on AT&T dampened its incentives to innovate, because rivals could respond to its innovations even before it could actually offer them; (2) these same filing requirements also dampened the regulated company's incentives to reduce prices; (3) the dominant firm's competitors could use the asymmetrical regulatory process to delay and undermine its initiatives; and (4) regulation imposed administrative costs on both the regulated firm and the FCC.

The dominant firm regulation at issue in these proceedings involves the same kinds of costs—if anything, they are compounded by the fact that CLECs are providing complete bundles of services, including interLATA, while the ILECs cannot respond until such time as their 271 applications are successful. Ironically, these applications are being held up pending demonstration that ILEC local markets are sufficiently open to competition!

The upgrading and modernization of the switched public network and the fullest exploitation of its capability of offering a variety of sophisticated and innovative services—which are the central goals of the Telecommunications Act of 1996—depend not just on freeing the telephone companies and all others from restrictions and handicaps on their ability to do so; it also requires offering all parties the full, undiluted incentives of a free market system to undertake the requisite, typically risky investments.

Those incentives are of two kinds. The first is the stimulus of competition itself. The strongest case for substituting the discipline of competition for that of regulation is the superior ability of the former to exert pressures on all producers to be efficient and innovative, if they are to survive, let alone prosper. Outstanding, unequivocal illustrations are the wholesale adoption of hub and spoke operations and the development of computerized reservations systems by the airlines after their deregulation, and the widespread adoption of just-in-time inventory systems made possible only by the freedom of truckers, conferred by their deregulation, to enter into binding contracts with penalties for failure to perform according to stipulated standards.

The second is the self-interest of the telephone companies, freed from continuing restrictions on the services they are permitted to offer. If they are to undertake the risks of investments in innovation, they must see the prospect of retaining the profits of the ones that turn out successfully, symmetrically with their bearing the full costs of the failures. This requires genuine deregulation.

Particularly during the next several years, when competitors in markets formerly protected by regulation will attempt to enter each other's domains in innovative and even unpredictable ways, it is essential that we not weaken the second of these incentives in a misguided effort to strengthen the first. Attempts to micromanage the process of deregulation, we have found in other industries, are more likely to produce distortions than actually to encourage efficient competition.[45] Ultimately, both incentive systems require the shrinking of

[45] Alfred E. Kahn, "Applications of Economics to an Imperfect World," the Richard T. Ely lecture, *The American Economic Review, Papers and Proceedings*, Vol. 69, No. 2, May 1979, pp. 1-13.

regulation and of all such regulatory restrictions to the absolute minimum and entrusting protection of the public to deregulated competition—subject. as always, to the constraints of the antitrust laws.[46]

IV. CONCLUSIONS

Following the approach the FCC has previously used to assess market power for other services, we have concluded that the market for high capacity services in the Phoenix area fully exhibits its stipulated indicia of competition. In particular, (1) US WEST has a diminishing market share—indeed, it serves only 30 percent of the retail market— and is barely providing one-half of the facilities that serve new demand; (2) customers are highly sensitive to price and other dimensions of service; (3) US WEST's existing competitors can readily expand their capacity sufficiently to displace it entirely, if it were to attempt to price monopolistically, and, in addition, barriers to entry are minimal; and (4) U S WEST's size gives it no insurmountable advantage.

Indeed, these indicia show intensifying competition, which strongly suggests that if the FCC grants U S WEST's Petition, there is virtually no likelihood that it will ever regain a dominant position that would call for reregulating its high capacity services. On the contrary, the relevant historical precedents indicate that regulators have little to fear from premature relaxation of regulation in these markets. For example, AT&T's market share has continued to decline since it obtained nondominant status in late 1995.[47]

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[46] See Kahn, *Letting Go: Deregulating the Process of Deregulation*, Michigan State University Institute of Public Utilities, 1998.

[47] Federal Communications Commission, *Trends in Telephone Service*, February 1998.

US WEST's lack of market power signifies that competition itself, without dominant firm regulation, is sufficient to restrain the Company's ability to impose anticompetitive prices and other conditions. In light of these developments, the costs of maintaining dominant firm regulation in this market clearly exceed whatever benefits continued regulation could possibly confer.

ALFRED E. KAHN

Alfred E. Kahn is the Robert Julius Thorne Professor of Political Economy, Emeritus, Cornell University and a Special Consultant to National Economic Research Associates, Inc. (NERA).

He has been Chairman of the New York Public Service Commission; Chairman of the Civil Aeronautics Board; and Advisor to the President (Carter) on Inflation and Chairman of the Council on Wage and Price Stability.

He received his Bachelor's and Master's degrees from New York University and a Doctorate in Economics from Yale University. Following service in the Army, he served as Chairman of the Department of Economics at Ripon College, Wisconsin. He moved to the Department of Economics at Cornell University, where he remained until he took leave to assume the Chairmanship of the New York Public Service Commission. During his tenure at Cornell, Professor Kahn served as Chairman of the Department of Economics, member of the Board of Trustees of the University and Dean of the College of Arts and Sciences.

Throughout his career, he has served on a variety of public and private boards and commissions including: the Attorney General's National Committee to Study the Antitrust Laws; the senior staff of the President's Council of Economic Advisors; the Economic Advisory Council of American Telephone & Telegraph Company; the National Academy of Sciences Advisory Review Committee on Sulfur Dioxide Emissions; the Environmental Advisory Committee of the Federal Energy Administration; the Public Advisory Board of the Electric Power Research Institute; the Board of Directors of the New York State Energy Research and Development Authority; the Executive Committee of the National Association of Regulatory Utility Commissioners; the National Commission for Review of Antitrust Laws and Procedures; the New York State Council on Fiscal and Economic Priorities; the Governor of New York's Fact-Finding Panel on Long Island Lighting Company's Nuclear Power Plant at Shoreham, L.I.; the Governor of New York's Advisory Committee on Public Power for Long Island; the National Governing Board of Common Cause; and, in 1990, as Chairman of the International Institute for Applied Systems Analysis Advisory Committee on Price Reform and Competition in the USSR.

He has also served as a court-appointed expert in State of New York v. Kraft General Foods, Inc., et al., U.S. Disctrict Court, S.D.N.Y.; Advisor to New York Governor Carey on Telecommunications Policy; and as a consultant to the Attorneys General of New York, Pennsylvania and Illinois, the Ford Foundation, the National Commission on Food Marketing, Federal Trade Commission, Antitrust Division of the Department of Justice, the U.S. Department of Agriculture and the City of Denver on charging and financing of Stapleton Airport.

He has received L.L.D. honorary degrees from Colby College, Ripon College, Northwestern University, the University of Massachusetts and Colgate University, and an honorary D.H.L. from the State University of New York, Albany; he also received the Distinguished Transportation Research Award of the Transportation Board Forum, The Alumni Achievement Award of New York University, the award of the American Economic Association's Transportation and Public Utilities Group for Outstanding Contributions to Scholarship, The Henry Edward Salzberg Honorary Award from Syracuse University for Outstanding Achievement in the Field of Transportation, the Burton Gordon Feldman Award for Distinguished Public Service from Brandeis University, the Wilbur Cross Medal for outstanding achievement (Yale University), The 1997 L. Welch Pogue Award For Lifetime Contributions to Aviation and the 1997 Sovereign Fund Award Honoring Vision, Commitment and Achievement in the Pursuit of Individual Freedom; and was elected to membership in the American Academy of Arts and Sciences and Vice President of the American Economic Association. He has been a regular commentator on PBS's "The Nightly Business Report."

He has testified before many U.S. Senate and House Committees, the Federal Power Commission, the Federal Energy Regulatory Commission and numerous state regulatory bodies.

His publications include *Great Britain in the World Economy; Fair Competition: The Law and Economics of Antitrust Policy* (co-authored); *Integration and Competition in the Petroleum Industry* (co-authored); *The Economics of Regulation*; and *Letting Go: Deregulating the Process of Deregulation*. He has written numerous articles which have appeared in *The American Economic Review, The Quarterly Journal of Economics, The Journal of Political Economy, Harvard Law Review, Yale Journal on Regulation, Yale Law Journal, Fortune, The Antitrust Bulletin* and *The Economist*, among others.

Please address all communication to:
Alfred E. Kahn
308 N. Cayuga Street
Ithaca, NY 14850
Tel: 607-277-3007
Fax: 607-277-1581
e-mail: alfred.kahn@nera.com or aek8@cornell.edu

TIMOTHY J. TARDIFF

Timothy J. Tardiff is a Vice President in the Cambridge, Massachusetts office of National Economic Research Associates, Inc. (NERA), where he specializes in the economics of the telecommunications industry.

Dr. Tardiff received a B.S. with honors in Mathematics from the California Institute of Technology in Pasadena and a Ph.D. degree in Social Science from the University of California, Irvine, under a National Science Foundation Pre-doctoral Fellowship and an NSF Grant for Improving Dissertation Research in the Social Sciences.

Dr. Tardiff joined the faculties of the Department of Civil Engineering and the Division of Environmental Studies at the University of California, Davis. He taught undergraduate and graduate level courses in transportation and environmental policy analysis. His research included applications of econometric models of consumer choice to transportation planning problems. Dr. Tardiff's research was funded by the National Science Foundation, the Institute of Transportation Studies and the California Department of Transportation.

Prior to joining NERA, Dr. Tardiff's work included transportation, energy, public utility and telephone industry projects for the U.S. Departments of Transportation and Energy, the California Energy Commission, and several telephone and electric utilities.

Since joining NERA, he has evaluated pricing policies for increasingly competitive telecommunications markets, including appropriate mechanisms for pricing access services to competitors; studied actual and potential competition for services provided by telephone operating companies; analyzed the demand and revenue impacts of new telephone rate structures; developed and evaluated damage studies used in major telecommunications antitrust actions; analyzed the market potential for wireless telephone services; evaluated the investment and marketing programs of telephone companies; and developed approaches for measuring incremental costs of telecommunications. Most recently, he has submitted affidavits, reports and testimony in federal and state regulatory proceedings on the implementation of the Telecommunications Act of 1996: including pricing of unbundled elements, universal service reform, carrier access pricing reform, and interLATA entry.

Dr. Tardiff has published extensively in the transportation literature. He has also presented and published papers on the telecommunications industry, which have appeared in publications such as the *American Economic Review*, *Information Economics and Policy*, and as chapters in several books. These papers address the issues of pricing and costing policies for emerging competition in telecommunications markets; evaluating and forecasting the impacts of telephone rate plans such as local measured service; analyzing the markets for new telecommunications products and services; and the development of competition for local exchange services.

Please address all communication to:
Timothy J. Tardiff
National Economic Research Associates
One Main Street, 5th Floor
Cambridge, MA 02142
Tel: 617-621-2614
Fax: 617-621-0336
e-mail: timothy.tardiff@nera.com

Affidavit

BE IT KNOWN, that Nickie L. R. Duff, the Undersigned, being of legal age, do hereby depose and say under oath as outlined in the attached document, entitled, "Phoenix Cost Study and Model", which is annexed and incorporated herein:

WITNESS my hand under the penalties of perjury this 13th day of August, 1998.

Nickie L R Duff
Signed

Signed

Signed

Signed

Before me this day personally appeared Nickie L. R. Duff, known to me to be the person described in and who executed this agreement.

WITNESS my hand and official seal at Boise in Ada County in the State of Idaho this 13th day of August, 1998.

Signature Sandra M. Galvez
Notary Public for Idaho
My commission expires 3/7/2000

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Quality Strategies Report

U S WEST

HIGH CAPACITY MARKET STUDY

PHOENIX

METROPOLITAN STATISTICAL AREA

August 7, 1998

QUALITY STRATEGIES.

WASHINGTON, D.C.

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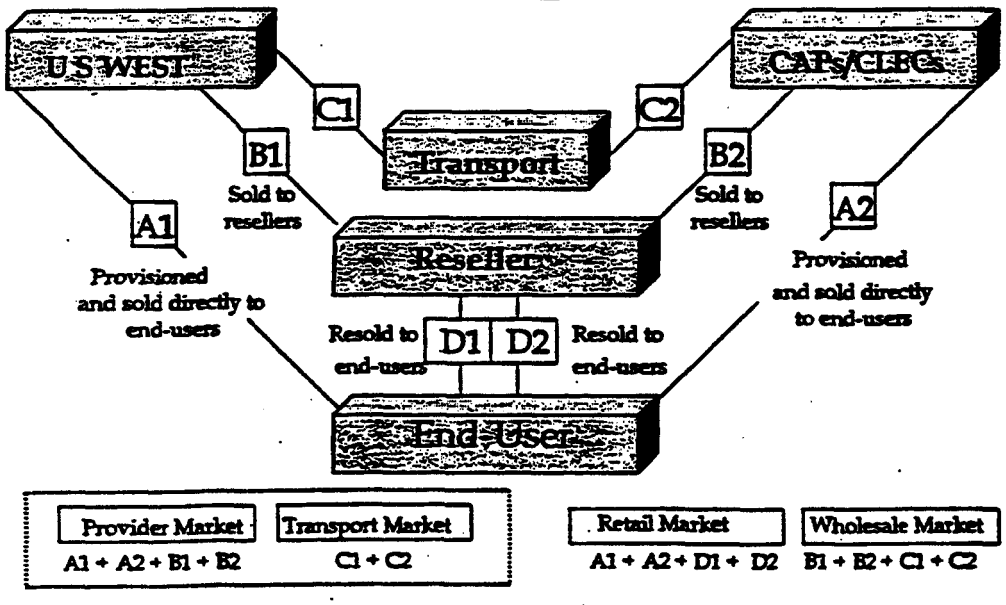
EXECUTIVE SUMMARY

This report analyzes the state of competition in the market for high capacity telecommunications services (i.e., DS1 and above) in the Phoenix, Arizona, metropolitan area. QUALITY STRATEGIES was asked to: describe the Phoenix High Capacity Market; describe the market participants; estimate the market shares of U S WEST and the other market participants; and to estimate the capacity of competitive providers of high capacity services in Phoenix.

The Phoenix market for high capacity services can be best described as a three tier market, as illustrated below, with U S WEST and other CAP/CLEC providers selling services to end users, resellers, and other carriers for "transport" purposes. This market can be sub-divided based on who high capacity services are sold to – Retail and Wholesale Markets – versus who is actually providing the underlying facilities – the Provider and Transport Markets.



Prior to the mid-1990's U S WEST largely had the Phoenix High Capacity Market to itself. Since 1994, MCI, GST, TCG, ELI, and MFS WorldCom have all turned-up high capacity networks in Phoenix. All of these competitors are seasoned well-financed telecommunications companies. Collectively, these five competitors have installed over 800 route miles of optical fiber and have connected several hundred buildings in the Phoenix area to their networks.

The growth in alternative fiber networks is reflected in market share data. In all cases, U S WEST's market share appears to be declining at a relatively rapid rate. As of the end of 1997, only 30% of the retail customers purchased high capacity services directly from U S WEST. The other 70% purchased services from resellers and other CAPs/CLECs. The situation was reversed with respect to the actual provision of high capacity service – where U S WEST accounted for 72.1% of the Provider Market and 84.1% of the Transport Market with the other providers accounting for the remainder. Even these relatively high market shares represent a significant decrease from the end of 1994 when U S WEST serviced 94.1% of the Provider Market.

Recent data indicates that other CAPs/CLECs are capturing approximately half of the growth in high capacity services, in the rapidly growing Phoenix market. Between the second and the fourth quarters of 1997, providers other than U S WEST accounted for 54% of the growth in the Provider Market and 42% of the Transport Market. This trend is expected to continue due to the fact that U S WEST competitors in Phoenix have an enormous amount of unused capacity in their existing fiber networks. It is estimated that less than 8% of the capacity of these competitive networks would be needed to handle all of U S WEST's existing traffic.

Both U S WEST's relatively low Retail Market share and the large amount of unused capacity in competitive networks make it highly likely that U S WEST's share of the Provider and Transport Markets will continue to decline. This decline will be exacerbated, particularly in the Transport Market, by continued consolidation in the telecommunications industry (e.g., the merger of AT&T and TCG).

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QUALITY STRATEGIES
Washington, D.C.
(703) 610-1000

INTRODUCTION

BACKGROUND

Although the Telecommunications Act of 1996 formally opened the local exchange market to competition for the first time, U S WEST has been experiencing competition of another type for several years. In the early part of the 1990s, Competitive Access Providers (CAPs) began installing fiber facilities in the Phoenix Metropolitan Statistical Area (MSA) to compete directly with the incumbent local exchange carrier, U S WEST, for a portion of its market.

Primarily, the CAPs began offering high capacity (DS-1 and DS-3) circuits to end-users and carriers as a means of bypassing the local exchange carrier (U S WEST). High capacity circuits are used to transport traffic between end user premises, from end-user premises to carrier Points of Presence (POPs) or to transport traffic between POPs and Central Offices (COs) or tandems.

THE HIGH CAPACITY MARKET

The High Capacity Market can be segmented in several ways. First, because high capacity circuits are used for two distinct purposes, two separate sub markets emerged: 1.) the Provider Market and 2.) the Transport Market. For purposes of this study, we will refer to the combination of the two as the High Capacity Market. Please refer to the graphic on page 9 for a visual description of this concept.

- Provider Market: Provider circuits are DS-1 and DS-3 circuits provisioned by a facilities-based local telecommunications provider (either U S WEST or a CAP). These circuits are ultimately purchased by end-users to transmit voice and data traffic from the end user's premise to a POP or CAP switching center. The provider does not always sell the circuit directly to the end user.
- Transport Market: Transport circuits are high capacity lines purchased by carriers to transmit voice and data traffic from one POP to another or to transmit voice and data traffic from a POP to a Central Office or tandems (for distribution). Transport circuits are purchased by one communications company from another communications company.

The overall High Capacity Market can also be viewed as consisting of a Wholesale Market and a Retail Market. Often a Local Exchange Carrier or CAP provisions a circuit, it does not necessarily maintain the account or bill for it – because it is often resold by another carrier. Because of this situation, QUALITY STRATEGIES is also providing Retail and Wholesale views of the High Capacity Market.

- Retail Market: the retail view is another method of distributing provider share. Instead of crediting the company that provisions the circuit, it credits the company that sells and bills for the circuit and maintains the relationship with the end user.
- Wholesale Market: the wholesale view consists of circuits provisioned by a local telecommunications provider (either U S WEST or a CAP) and sold to another telecommunications provider – either for resale to end users or for transport. Please refer to the graphic on page 9 for a visual description of this concept.

These distinct views became necessary as the High Capacity Market began to mature and purchasing patterns began to deviate from the typical provider - purchaser standard. From the outset, CAPs attempted to form alliances with long distance carriers to provide the private lines linking their customers to their POPs, as well as providing their transport facilities. It is from these beginnings that the concept of High Capacity resale was formed necessitating the Retail and Wholesale views to supplement Provider and Transport views. At present, many CAPs operating in the Phoenix market sell more circuits to long distance carriers than to end users. Because of this, Provider and Retail market share figures illustrate very distinct distributions, although both measure the same market.

COMPETITORS

Currently, the following five CAPs operate networks in the Phoenix MSA (Maricopa and Pinal Counties) and compete with U S WEST for Provider and Transport market share:

- MFS WorldCom
- Teleport Communications Group (TCG)
- MCI
- GST
- Electric Lightwave, Inc. (ELI)

Each of the five aforementioned competitors has invested resources to build optical fiber networks in the Phoenix area that compete directly with U S WEST. Collectively, the five competitors have installed over 800 route miles of optical fiber and connected several hundred buildings to their networks. Equipped as they are today, the CAPs could assume all of U S WEST's Provider and Transport traffic with their networks at less than 8% capacity. This would leave the other 92% to capture future growth of bandwidth demand.

Because the High Capacity (Transport and Provider) Market is very specialized, the CAPs have become niche communications providers catering to interexchange carriers and business customers in particular vertical segments (particularly financial services, health care, and information transfer). This has allowed CAPs to focus on small geographic areas when constructing fiber networks (particularly central business districts and business-intensive suburbs).

MARKET SHARE

To formulate market share estimates, QUALITY STRATEGIES considered several inputs. Results are primarily based on primary, survey market research that elicits share figures based on end user data. Additionally, QUALITY STRATEGIES analysts conducted an exhaustive competitive research analysis to gather additional information about each market examined.

As of the fourth quarter of 1997, U S WEST's share of the High Capacity Market was 77%. During this time, U S WEST share of the Provider Market was 72%. In other words, U S WEST facilities constituted 72% of circuits being used by end users for DS-1 and DS-3 high capacity services. U S WEST retained less than 30% of the Retail Market - meaning U S WEST maintained a relationship with fewer than one third of all end users in the fourth quarter of 1997. The disparity is largely the result of carrier purchases of U S WEST/CAP circuits for resale to end-users.

In the fourth quarter, U S WEST circuits constituted approximately 84% of the Phoenix Transport Market (down from 94% in the second quarter of 1997). CAPs generally install extraordinary amounts of excess capacity around long distance POPs and local COs and are capable of absorbing traffic from U S WEST facilities immediately. This is the primary reason for the significant drop in market share between the second and fourth quarters of 1997; by installing excess capacity, CAPs have facilitated a situation where traffic can be easily migrated from one carrier's facilities (U S WEST) to another's (Phoenix CAPs). U S WEST's Transport share is particularly vulnerable to competitors as long distance carriers and CAPs begin to consolidate.

In addition to the Transport Market, recent telecom mergers and consolidations are likely to impact the Wholesale Market. In the fourth quarter of 1997, U S WEST accounted for approximately 79% of the Wholesale Market, which includes circuits sold to carriers for purposes of resale or for transport. As CAPs' and carriers' relationships grow, carriers are less likely to purchase wholesale circuits from U S WEST and become more reliant on acquired subsidiaries.

The continuing trend toward a declining market share for U S WEST becomes evident through an examination of its share of market growth over the last several quarters. Between the second and fourth quarters of 1997, U S WEST accounted for 58% of Transport Market growth and 46% of Provider Market growth. Losses in market growth may not become evident in installed-base share results for several quarters as the market grows and U S WEST accounts for a smaller percentage of the total. Share of growth is the primary indicator of how a competitor's installed-base market share will look in the future - and CAP competitors in the Phoenix area have captured a majority share of market growth over the past several years.

OBJECTIVES

The primary objective of this report is to provide U S WEST with a high-level overview of the Phoenix MSA (Maricopa and Pinal Counties) High Capacity Market. The report is structured to meet this objective by providing:

- A description of the High Capacity Market and sub-markets
- A description of the High Capacity competitive landscape in the Phoenix MSA
- An estimate of the potential competitive capacity of existing fiber networks
- Market share estimates for U S WEST and its competitors

This report describes and defines the Phoenix MSA High Capacity Market, identifies the types of circuits included in the share estimates, briefly describes common high capacity applications, and identifies and describes the strengths and weaknesses of facilities based competitors in the Phoenix MSA. The competitive analysis identifies market trends, carrier consolidation, and purchaser capacity requirements.

CAPABILITIES AND EXPERIENCE

QUALITY STRATEGIES is a research and consulting firm working exclusively in the telecom industry. QUALITY STRATEGIES has provided competitive market information, including market share results and competitive market data to every RBOC and large LEC for the last decade.

QUALITY STRATEGIES maintains its own professional team of analysts, methodologists, client service personnel and calling centers focused exclusively on the telecommunications market.

QUALITY STRATEGIES believes that quantitative market share data can be coupled with qualitative competitive data to accurately describe and assess the market for high capacity circuits. The information provided in each section is designed to supplement that from the other. This analysis is based on primary and secondary market research conducted for U S WEST. Market Share estimates reflect fourth quarter, 1997 analyses. Overall Provider and Retail estimates are based on a 95% confidence interval with a ±5% margin of error. Wholesale and Transport market share estimates are primarily the result of extensive competitive research. (see appendix for additional information on methodology).

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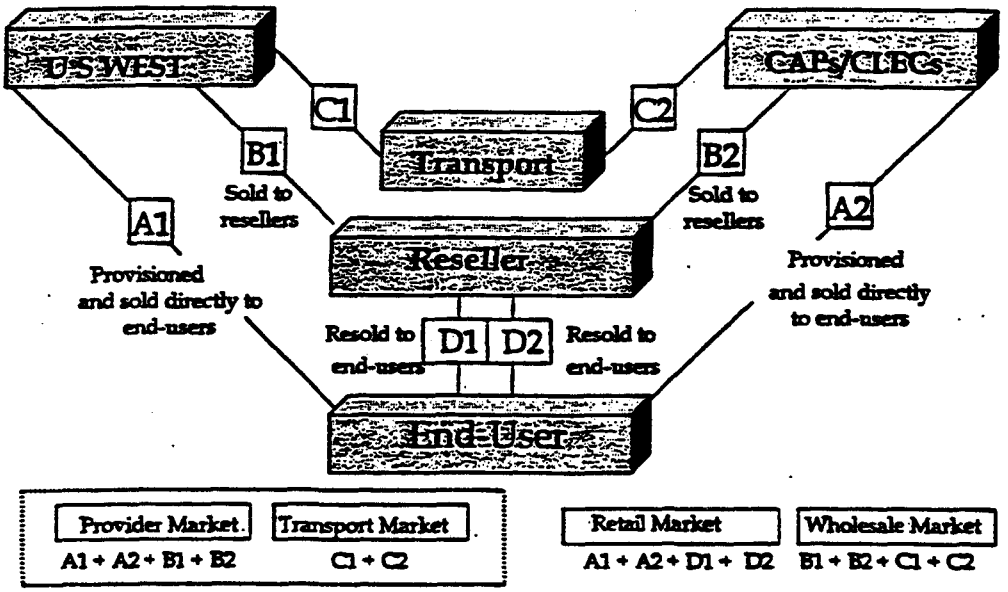
MARKET DESCRIPTION

HIGH CAPACITY MARKET

QUALITY STRATEGIES defines the High Capacity Market as the universe of DS-1 (1.544 mbps) and DS-3 (45 mbps) circuits used either for end user customer's traffic (Provider) or for carrier transport (Transport).

- End users utilize high capacity circuits to connect two business locations in the same LATA (point-to-point) or to connect to a carrier's point-of-presence (POP) (special access).
- Carriers utilize high capacity transport circuits to provide links between POPs, central offices, and tandems.

The following diagram depicts the various components of the High Capacity Market, which is represented by the sum of A1, A2, B1, B2, C1 and C2.



PROVIDER MARKET

Provider circuits are DS-1 and DS-3 circuits provisioned by a facilities-based local telecommunications provider (either U S WEST or a CAP). These circuits are ultimately purchased by end users to transmit voice and data traffic from the end user's premise to a POP or CAP switching center. The provider does not always sell the circuit directly to the end user. Referring to the visual, the Provider Market is defined as A1+A2+B1+B2.

TRANSPORT MARKET

Transport circuits are high capacity lines purchased by carriers to transmit voice and data traffic from one POP to another or to transmit voice and data traffic from a POP to a central office or tandems (for distribution). Transport circuits are purchased <u>by</u> one communications company <u>from</u> another communications company. Referring to the graphic, the Transport Market is comprised of C1+C2.

THE RETAIL MARKET

The retail view is another method of distributing Provider share. Instead of crediting the company that provisions the circuit, the Retail Market credits the company that sells and bills for the circuit and maintains the relationship with the end user. The Retail Market is defined as A1+A2+D1+D2 (see diagram page 9).

THE WHOLESALE MARKET

The wholesale view consists of circuits provisioned by a local telecommunications provider (either U S WEST or a CAP) and sold to another telecommunications provider - either for resale to end users or for transport. The Wholesale Market is comprised of B1+B2+C1+C2 (see diagram page 9).

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Washington, D.C.
(703) 610-1000

MARKET SHARE

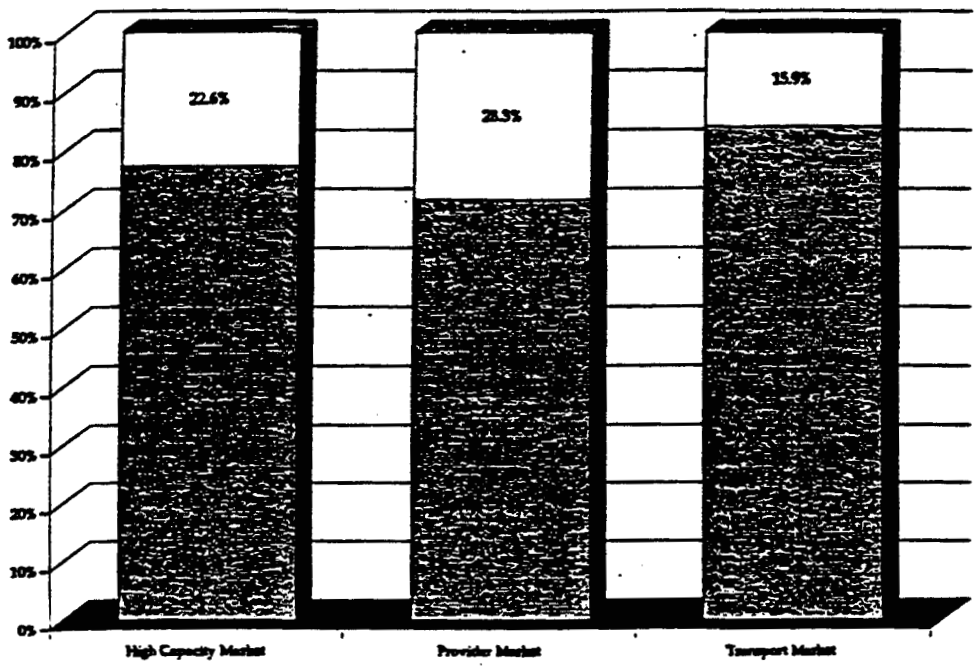
Because the Phoenix market has become increasingly competitive over the last two years, U S WEST has experienced rapid, consistent erosion of its High Capacity Market share. QUALITY STRATEGIES has been tracking U S WEST's Provider Market share since 1994 and its Transport Market share since 1997. As could be expected, U S WEST's share of each market has decreased substantially as CAPs have entered the market and expanded existing facilities.

Following are several views of the High Capacity Market. All of the charts include DS-1 and DS-3 circuit information. On some of the charts DS-0 circuit information is also included. The charts which include DS-0 circuits are clearly labeled. DS-0 circuits are included because in some views of the market the survey results included DS-0 circuits and this information cannot be extracted. Overall the DS-0 circuits when converted to DS-1 equivalents do not appreciably affect the results, accounting for approximately 3% of the market.

HIGH CAPACITY MARKET

U S WEST's market share for the fourth quarter of 1997 accounts for approximately 77% of the High Capacity Market in the greater Phoenix area. The market is comprised of the Provider Market (in which U S WEST accounts for approximately 72% of the total) and the Transport Market (in which U S WEST accounts for 84%).

PHOENIX MSA
U S WEST HIGH CAPACITY MARKET SHARE
4Q97



	U S WEST	Competitors
High Capacity	77.4%	22.6%
Provider	71.7%	28.3%
Transport	84.1%	15.9%

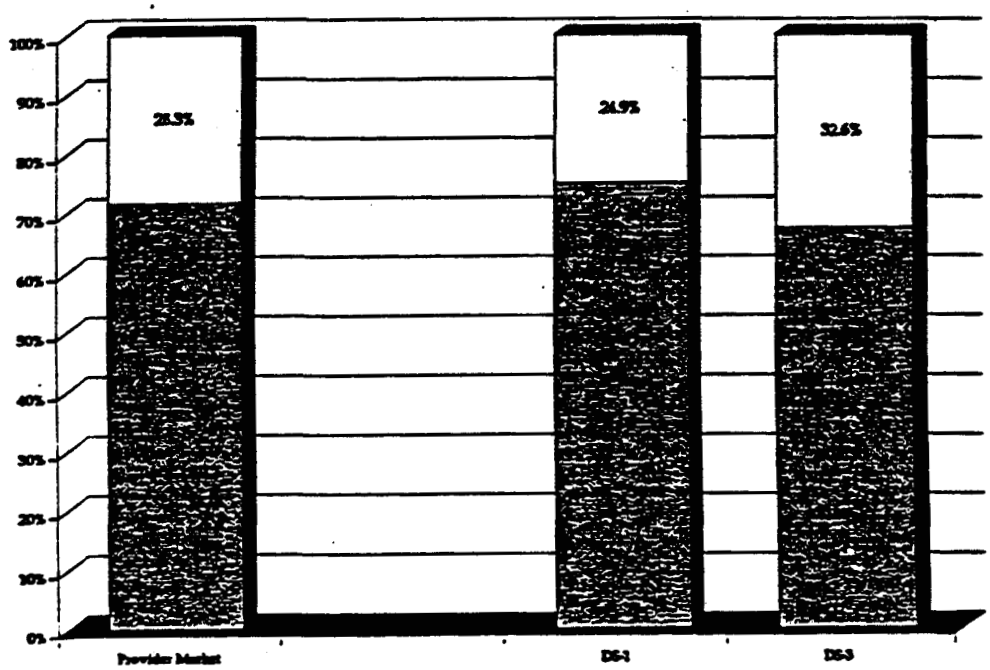
Results for Provider Market are presented at a 95% Confidence Level with a ±5% Margin of Error.

PROVIDER MARKET

To date, facilities-based competitors have captured over 28% of the Provider High Capacity Market in the Phoenix MSA. This can be attributed to recent marketing campaigns geared toward the end user and a proliferation of competitive alliances between CAPs and long distance carriers.

The High Capacity study was designed to measure U S WEST's and its competitors' share of DS-1 and DS-3 circuits. As a provider, U S WEST's share of the DS-3 market has declined more rapidly than its share of the DS-1 market. This is largely attributable to competitor's marketing strategies that attempt to secure accounts from large, bandwidth-intensive businesses. Because many of the larger businesses end users are located in Phoenix's central business district, competitors have been able to reach them on a facilities basis without investing a substantial amount of resources in infrastructure.

PHOENIX MSA
U S WEST PROVIDER MARKET RESULTS (BY CIRCUIT SPEED)
4Q97



	U S WEST	Competitors
Provider Market	71.7%	28.3%
DS-1	75.1%	24.9%
DS-3	67.4%	32.6%

Results for Provider Market are presented at a 95% Confidence Level with a ±5% Margin of Error. Disaggregated Share results have higher margins of error to account for smaller sample sizes

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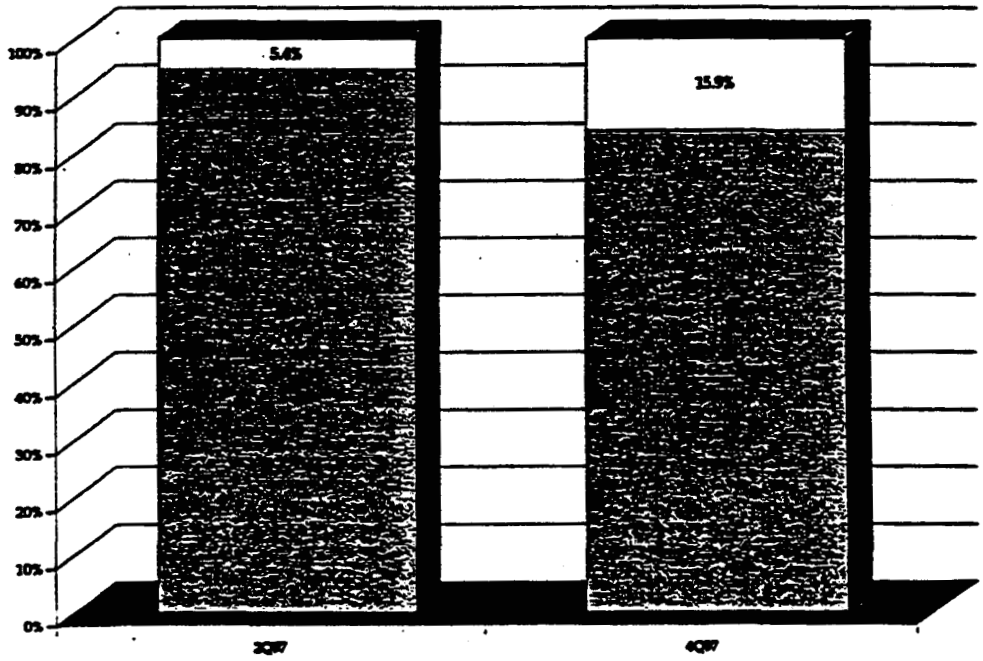
TRANSPORT MARKET

As has been the case in the Provider Market, CAPs are beginning to capture a large percentage of the Transport Market. As of fourth quarter, 1997, competitors comprise roughly 16% of the Transport Market, up from 5% in the second quarter of 1997. This is largely the result of a desire on the part of carriers to minimize dependence on U S WEST. Additionally, CAP share of the Transport Market is likely to increase substantially as they are absorbed by interexchange carriers and other, large telecommunications companies. Although U S WEST's share of the Transport Market is higher than its share of the Provider Market, Transport Market incremental losses have been far greater recently (over 10% since second quarter 1997) as CAPs and carriers have merged and formed competitive alliances. While U S WEST's market position is vulnerable in each market, many analysts foresee the rapid erosion of RBOC Transport Market share in the near future

PHOENIX MSA

TRANSPORT MARKET SHARE

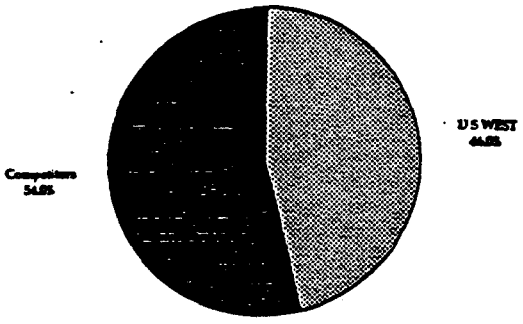
2Q97-4Q97



	2Q97	4Q97
U S WEST	94.6%	84.1%
Competitors	5.4%	15.9%
	100.0%	100.0%

PROVIDER MARKET GROWTH

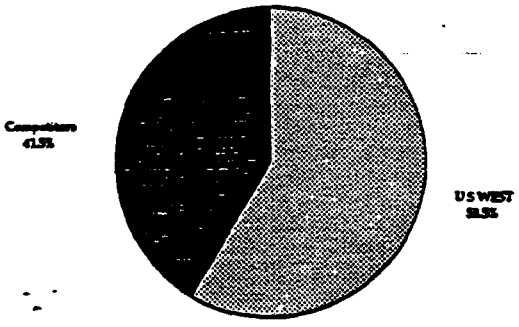
One of the key indicators of future market share in the telecommunications market is share of market growth in the present. Market growth is defined as new market growth (new subscriptions), the conversion of switched lines to high capacity facilities and competitive conversions. From the second quarter of 1997 to the fourth quarters of 1997, QUALITY STRATEGIES estimates the Provider Market grew 6.5%. Although U S WEST accounts for over 72% of Provider high capacity circuits, U S WEST accounted for roughly only 46% of the market growth. Facilities based competitors were responsible for over one half of new high capacity circuits added between June and September. At this rate, U S WEST can expect its share of the installed base to diminish to its share of market growth.



	2Q97 - 4Q97
U S WEST	46.0%
Competitors	54.0%
	100%

TRANSPORT MARKET GROWTH

Although U S WEST's share of the Transport Market growth is higher than its share of Provider Market growth, the facilities-based competitors account for a substantial percentage. Between the second and fourth quarters of 1997, U S WEST was responsible for less than 59% of new transport circuits. At this pace, U S WEST can expect its share of the installed base to continue to decline.



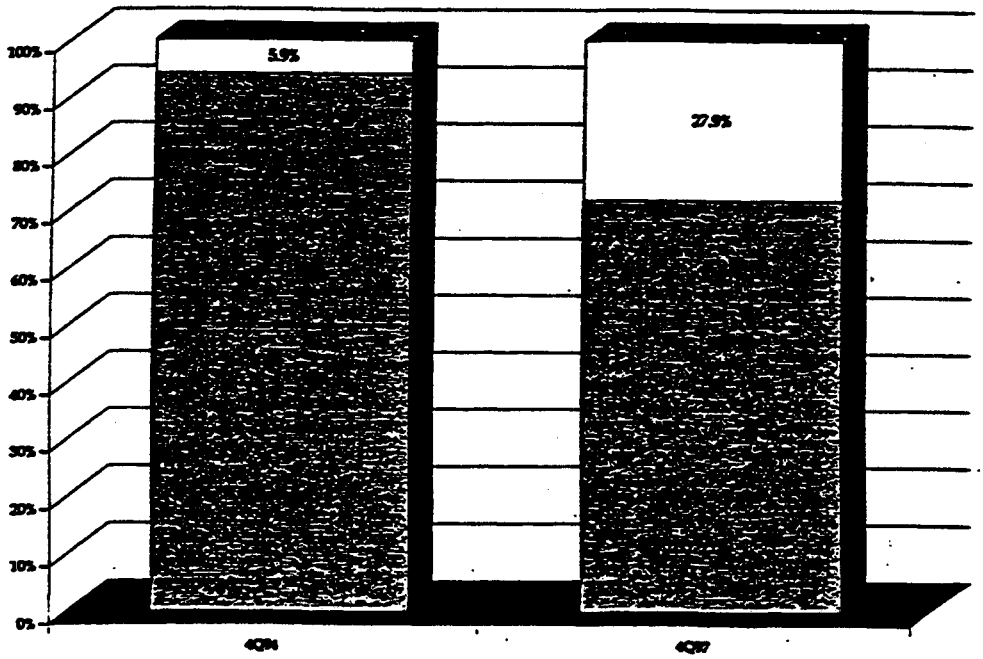
	2Q97 - 4Q97
U S WEST	58.5%
Competitors	41.5%
	100.0%

TREND

The most effective means of demonstrating U S WEST Provider Market share loss is to view its share over time. QUALITY STRATEGIES has been tracking high capacity data for U S WEST since the fourth quarter of 1994. Since that time, U S WEST has relinquished a considerable portion of the Provider Market. In 1994, TCG was the only CAP operating in the city – and its network was limited at that time. Over the next three years, the CAP presence in the Phoenix MSA grew rapidly and conversely, U S WEST's market share fell rapidly.

The following chart provides market share trend data. Trend includes DS-1, DS-3, and DS-0 circuits.

PHOENIX MSA
PROVIDER MARKET SHARE TREND*
4Q94-4Q97



	4Q94	4Q97	Δ 4Q 94–4Q 97
U S WEST	94.1%	72.1%	-22.0%
Competitors	5.9%	27.9%	22.0%
	100.0%	100.0%	

*Trend data for the Provider Market includes DS-0, DS-1, and DS-3 circuits.
Results for the Provider Market are presented at a 95% Confidence Level with a ±5% Margin of Error.

RETAIL MARKET

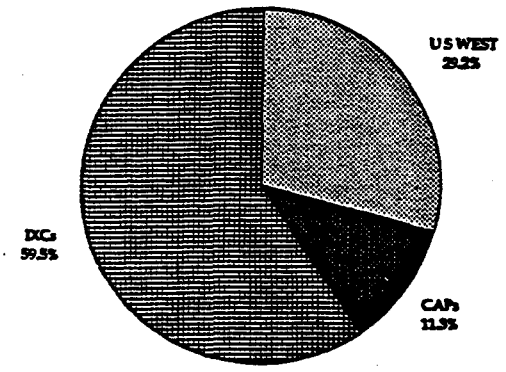
As indicated previously, the High Capacity Market can also be viewed as Retail and Wholesale Markets. In the Retail Market, competitors account for approximately 70% of end user relationships. U S WEST's largest competitors are currently AT&T, MCI, and Sprint. However, the vast majority of IXC-billed high capacity circuits are resold by the carrier rather than provisioned directly. As of fourth quarter 1997, AT&T's and TCG's combined retail share accounts for a greater percentage of the total market than U S WEST. Following completion of the AT&T/TCG and WorldCom/MCI mergers, the two aforementioned providers will comprise over 50% of the Retail Market.

This Retail data includes DS-1, DS-3, and DS-0 circuits.

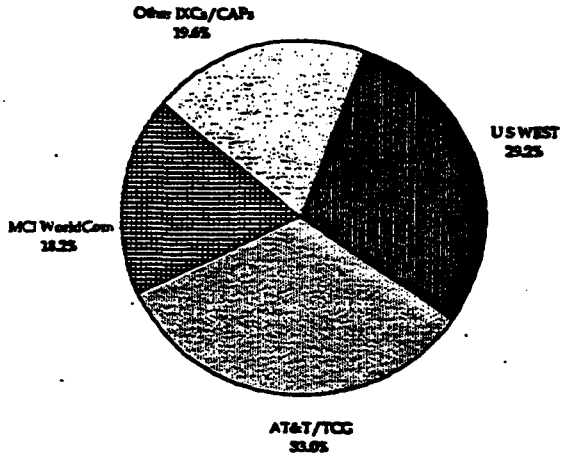
PHOENIX MSA

U S WEST MARKET SHARE OF THE RETAIL MARKET*

4Q97



RETAIL SHARE (U S WEST AND COMPETITORS)



Retail Share (IXCs and Acquired CAPs shown together)

*Retail Market includes DS-0, DS-1, and DS-3 circuits.
Results for the Retail Market are presented at a 95% Confidence Level with a ±5% Margin of Error. Disaggregated Share results have higher margins of error to account for smaller sample sizes.

WHOLESALE MARKET

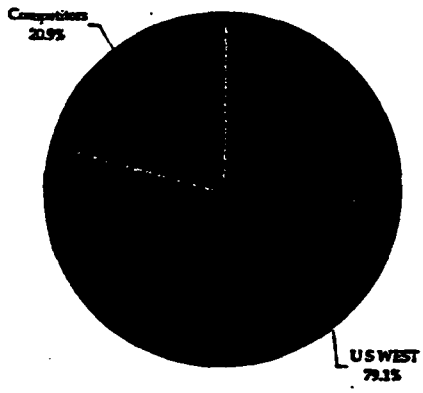
Currently, U S WEST accounts for less than 80% of the Wholesale Market (defined as the universe of circuits sold to resellers and circuits used for transport). However, U S WEST's share is likely to decrease substantially over the next several quarters following the completion of recent mergers in the telecom industry. AT&T and MCI will begin to take advantage of having local facilities at their disposal and attempt to decrease the amount of business it conducts with the RBOCs.

Wholesale data includes DS-1, DS-3, and DS-0 circuits.

PHOENIX MSA

U S WEST MARKET SHARE OF THE WHOLESALE MARKET*

4Q97



	4Q97
U S WEST	79.1%
Competitors	20.9%
	100.0%

*Wholesale Market includes DS-0, DS-1, and DS-3 circuits.

COMPETITIVE LANDSCAPE

OVERVIEW

As one of the largest MSAs in the nation, Phoenix has become home to numerous communications-intensive businesses that require high capacity DS-1 and DS-3 services. Phoenix is one of the most rapidly growing areas in the United States, with demand for these high capacity services expected to escalate. Analysts project that the Phoenix area will sustain an annual immigration rate of over 50,000 people for the next 15 years. This figure does not even take into account the area's birth rate, which is also likely to be higher than the national average due to Phoenix/Maricopa County's low median age. This growth in population will demand expansion of the telecommunications infrastructure to provision these high capacity services. U S WEST and its competitors will focus on meeting this demand.

Phoenix is currently host to one of the most competitive telecommunications markets in U S WEST's territory. While competitors' facilities once focused on the central business district exclusively, investments in network build-out over the last 24 months have resulted in fiber facilities that reach the furthest-lying suburbs. Today's competitive fiber networks connect several hundred buildings in Phoenix and transmit voice and data traffic for a variety of services including local exchange, high capacity, long distance and data.

U S WEST's competitors in the greater Phoenix area include facilities based CAPs such as TCG, WorldCom, ELI, GST and MCI. These companies offer a wide array of telecommunications products and services. A brief overview of these companies and their competitive presence in the Phoenix area follows.

COMPETITORS

MFS WORLDCOM

MFS WorldCom (formerly Metropolitan Fiber Systems) was established in the mid 1980s and partially financed by the Peter Keiwet construction company of Omaha, NE. In 1996, the assets of MFS were purchased by Jackson, MS-based LDDS WorldCom in an exchange of debt. MFS WorldCom operates metropolitan fiber networks in over 50 of the largest markets in the United States and is generally regarded as one of the leaders in competitive local telecommunications. In 1997, it purchased Brooks Fiber Properties and assumed its fiber networks in several tier II and tier III markets throughout the United States.

In Phoenix, MFS WorldCom's network has been operational since 1995 when it initiated service to several large end users and every major carrier in the central business district. Since then, the network has expanded to encompass a much broader geographic area.

MFS WorldCom's Phoenix network consists of four overlapping SONET rings featuring backbone speeds of OC-48. It is equipped with backup power sources and route diversity. In 1997, MFS WorldCom installed a central office switch in Phoenix that will allow it to diversify its product offering with the rollout of local exchange services. It currently operates two equipment sites in the area, one downtown and one on 44th Street. Currently, there are over 50 single and multi-tenant buildings connected to WorldCom's network in the Phoenix MSA.

Traditionally, MFS WorldCom has targeted the middle market for telecommunications services. Although many of its high capacity customers represent the large business segment, a large percentage of its local exchange customers are smaller organizations. In several markets, MFS WorldCom has purchased telecommunications providers to establish a customer base - including several Centrex resellers in California. Although MFS has worked with every major IXC over the last several years, it prefers to sell directly to the end user and maintain the account itself. This is particularly true following the LDDS/WorldCom merger.

TELEPORT COMMUNICATIONS GROUP (TCG)

Along with MFS WorldCom, TCG is a national CAP/CLEC operating fiber networks in 60 of the United States' largest markets. It has been in existence since the late 1980s when it was founded by Robert Annunziata, a former AT&T employee who was then working for Merrill Lynch in New York. Mr. Annunziata is often credited for starting the CAP movement when he installed a fiber link connecting Merrill Lynch's Manhattan headquarters to the company's teleport on Staten Island. Initially, TCG was financed by Merrill Lynch but was later spun off and financed by several leading cable companies, Sprint, and public debt offerings.

TCG was among the first entrants to the Phoenix communications market when it initiated service along its fiber network in 1994. Presently, TCG operates the largest fiber network in the greater Phoenix area; spanning over 300 route miles and connecting between 120 and 150 single and multi-tenant buildings. TCG's network is composed of 11 self-healing SONET rings and is capable of providing facilities-based service to the majority of the MSA's business-intensive localities, including: downtown Phoenix, Scottsdale, Tempe, Mesa, and Chandler. Currently, TCG operates three equipment sites in the greater Phoenix area, two within the city of Phoenix as well as one in Tempe.

In 1996, TCG was authorized by the Arizona Public Utilities Commission to offer local switched services in the Phoenix area via its Lucent 5ESS central office switch. Traditionally, TCG has marketed integrated packages of telecommunications services to the largest business end users. However, TCG has recently modified that strategy and attempted to move "down-market." This is largely the result of its local exchange product rollout and the proliferation of high capacity use among smaller and medium-sized businesses.

Since 1994, TCG has adhered to a very aggressive expansion schedule, having completed a 30 route mile, OC-48 fiber ring in the Southeastern suburb of Chandler in 1997. Before beginning the extension, however, TCG secured a high capacity contract with Motorola - which operates a large office in Chandler.

GST

GST became a player in the Phoenix high capacity market in 1997 when it purchased the rights to the Phoenix Fiber Access network (which had previously been a 50/50 joint venture between GST and the IntelCom Group). The majority of the network was installed in 1996 and is largely limited to Phoenix's central business district.

Although GST's footprint in the Phoenix market may be smaller than several of its competitors, it plans to become a force in the Arizona communications market on a statewide level. In addition to its Phoenix network, GST operates facilities in the greater Tucson area (located approximately 120 miles South of Phoenix). Its Tucson network currently consists of over 70 route miles and connects several of the area's larger buildings. In 1997, GST completed construction of long-haul facilities connecting the Phoenix and Tucson markets; allowing it to target businesses operating in both locations. It will also allow GST to accumulate wholesale revenue by leasing capacity to other telecommunications companies.

GST is headquartered in Vancouver, WA and run by industry veteran John Warta (GST's chairman and CEO). GST operates networks throughout the western United States; focusing primarily on tier II and III markets. In the Southwest, GST runs metropolitan area networks in Phoenix, Tucson, Albuquerque, and Los Angeles. To route local traffic, GST has installed a Nortel DMS 500 central office switch at its equipment site on Lincoln Street at 18th Avenue.

MCI

In its attempt to become a full-service, facilities-based telecommunications provider in the greater Phoenix area, MCI has built a small fiber network in the city's central business district to transmit voice and data traffic. In contrast with several other CAPs/CLECs in Phoenix, MCI has not invested heavily in fiber facilities to serve end users on the city's periphery or in the suburbs. Instead, it has limited the scope of its network to the city's downtown area and connected the buildings that house its largest long distance accounts (to provide facilities-based high capacity service). MCI also provides services through resale.

Traditionally, MCI has targeted the large business segment for voice and data services (long distance, high capacity, data, and local exchange). Therefore, it finds itself competing primarily with U S WEST and TCG rather than MFS WorldCom and ELI. In Phoenix, MCI is the primary long distance carrier for several Fortune 500 companies - a sales channel that it frequently leverages to win high capacity and local exchange accounts. Today's MCI offers a variety of multi-service packages that include long distance, local exchange, high capacity and internet access.

In each of its local markets, MCI builds its fiber networks according to SONET ring architecture. Its network backbones run at speeds up to OC-48 and feature route diversity and electronic redundancy. To route local exchange traffic in Phoenix, MCI installed a Nortel DMS 500 in 1996 (although it was not activated until 1997).

ELI

Having turned up its network in 1994, ELI was one of the first providers of competitive telecommunications services in the greater Phoenix area. Like MCI and MFS WorldCom, ELI originally limited the scope of its network to Phoenix's central business district. However, it decided to expand its network as the suburban demand for communications services increased. In 1997, ELI entered into a strategic alliance with the Salt River Project (SRP), an electric utility provider in the state of Arizona. Under the terms of the agreement, ELI leases substantial amounts of SRP dark fiber that traverses the entire area. The combined ELI-SRP network now encompasses over 400 route miles and is capable of delivering facilities-based service to Phoenix, Tempe, Scottsdale, Chandler, and Gilbert among others.

Historically, ELI has focused its marketing efforts on the middle market, although it has recently increased marketing campaigns directed toward Internet Service Providers (ISPs). One of its primary overall strategies is to establish several communications networks in the western United States and become a regional provider of communications services. At present, ELI operates competitive facilities in Phoenix, Salt Lake City, Las Vegas, Portland, and Seattle, enabling ELI to effectively market service to businesses operating in one or more of these markets. Additionally, ELI has established long-haul links between many of its markets and leases capacity to ISPs and other carriers.

ELI's network in Phoenix consists of multiple, overlapping SONET rings both in the city and in the suburbs. It employs a counter-rotating ring configuration in the construction of its backbone to add redundancy and protect against network failure. To ensure that fiber cuts do not result in lost traffic, ELI has built its network with route diversity and electronic redundancy to reroute traffic in milliseconds. In 1997, ELI installed a Nortel DMS 500 central office switch to route local exchange traffic.

CONSOLIDATION

Over the last two years, mergers and competitive alliances have transformed the competitive landscape of the telecommunications market. Several of these mergers involve CAPs and long distance carriers that compete directly with U S WEST and will dramatically affect its market position over the next several years.

MCI/MFS WORLDCOM

The first major merger announced in 1997 (involving U S WEST competitors) was a union of MCI Communications of Washington, D.C. and WorldCom of Jackson, MS. The merger follows WorldCom's 1996 acquisition of Metropolitan Fiber Systems (a facilities-based competitor of U S WEST in the Phoenix area) and its 1997 acquisition of Brooks Fiber Properties. Additionally, MFS has already acquired national ISP UUNET in 1996 before its acquisition by WorldCom. The combined entity will have enormous market power in Phoenix and the United States as a whole. It combines the nation's second and fourth largest long distance companies, a major provider of competitive local communications services, and the two largest internet backbone operators in the world.

When the merger is complete (projected to happen in the third quarter of 1998), MCI WorldCom's sphere of influence in the Phoenix MSA will increase dramatically. The combined facilities will result in:

- Over 100 route miles of local fiber (including WorldCom's 75 route mile backbone and MCI's 20-30 miles)
- Two central office switches
- 70-100 "lit" buildings
- Several long-distance POPs and switches

With this merger MCI WorldCom will be able to decrease its reliance on U S WEST's services and facilities. Currently, U S WEST provisions hundred of high capacity circuits linking MCI long distance customers to the MCI POP in Phoenix. However, it will have the option of moving a large percentage of this traffic over to WorldCom facilities - resulting in a substantial reduction in MCI's costs. Because WorldCom has connected numerous buildings to its Phoenix-area network, MCI will have the option of providing true facilities-based service on a large-scale basis through the utilization of WorldCom facilities. MCI may also further decrease its reliance on U S WEST's facilities which supply the infrastructure used for the origination and termination of long-distance calls by migrating transport traffic from U S WEST-provisioned circuits to WorldCom's facilities, resulting in a reduction in MCI's operating costs as well as a reduction in U S WEST's access revenues.

Additionally, the two companies have an apparent synergy that will strengthen the merged carrier and allow it to impact the market quickly. Because WorldCom's traditional market consists of smaller and medium-sized businesses while MCI tends to focus on the large business market, there will be minimal overlap in sales forces and a less complicated integration of operations.

AT&T/TCG

Also in 1997, AT&T and TCG announced a merger that analysts expect to be complete by the end of the third quarter of this year. The acquisition provides AT&T with an easy, rapid entrance to the facilities-based local exchange and High Capacity Markets. TCG becomes the recipient of a well-established sales channel to increase its switched services customer base.

In a manner similar to the MCI/WorldCom merger, there is an apparent synergy between AT&T and TCG. Traditionally, TCG has directed its marketing efforts toward the large business market, and rapidly accumulated a customer list laden with Fortune 500 companies. Conversely, AT&T's recent strengths have been the small business and consumer markets. With the merger, AT&T will be poised to reassert its influence among large business customers and TCG will expand its penetration to include the small business market. TCG will also acquire additional resources from the merger to allocate for network expansion in the Phoenix MSA.

Like MCI, AT&T stands to benefit significantly from the merger in that it will undoubtedly lead to a reduction in operating costs in its core business - long distance. AT&T will be able to reduce its reliance on U S WEST for high capacity circuits to AT&T's customers, transport, and switched access, further reducing U S WEST's infrastructure revenues.

COMPETITORS AT A GLANCE

The following matrices provide summary information for high capacity facilities-based competitors in the Phoenix MSA. For additional information please refer to the appendix attached.

	WorldCom	TCG	MCI
Overall Strategy	One-stop provider for communications services, including local exchange, HICAP, data, internet, long-distance.	Leading provider of communications solutions to businesses. Service packages include local, data, long-distance, HICAP.	One-stop, single billing for businesses. Services include local, long-distance, HICAP, data.
Approximate Route Miles	75	>300	20-40
On-net Buildings	>50	>150	25-35
Central Office Switching	Nortel DMS 500	Lucent 5ESS	Nortel DMS 500
Network Establishment	2Q95	2Q94	1996
Business Target Markets	Traditional focus on the middle market. Seeks national accounts, solicits to other tenants in on-net buildings. Focus on existing WorldCom, UUNET customers.	Traditional focus on high-end users, now moving "down-market." Most TCG customers have enormous communications needs.	Traditional focus on large businesses. Relies heavily on existing L.D. customer base. Reputation for outstanding customer service.
Residential Target Markets	Not actively targeting	Not actively targeting	Not actively targeting
Geographic Areas	Phoenix's central business district, Camelback/Lincoln areas, Tempe, Scottsdale, and the Sky Harbor Airport	Area wide. Central Phoenix, Camelback, Scottsdale, Tempe, Mesa, Chandler, Glendale, Paradise Valley, Phoenix Sky Harbor Intl. Airport, Tolleson	Fiber is located in Phoenix's central business district (although MCI provides services in Mesa, Scottsdale, and Tempe via resale and use of U S WEST facilities)
Competitive Alliances	Pending merger with MCI to form MCI WorldCom	Pending merger with AT&T	Pending merger with WorldCom to form MCI WorldCom

(Continued on next page)

COMPETITORS AT A GLANCE

	ELI	GST
Overall Strategy	Provider of diversified communications services, including local, L.D., HICAP, and data services	Provider of integrated communications services – DS-0 through OC-N, data services, local exchange, ISDN
Approximate Route Miles	400	11 miles in downtown Phoenix with an additional 18 miles of right-of-way and conduit available for expansion. 300 Route miles of fiber in the state of Arizona
On-net Buildings	30-45	15-25
Central Office Switching	Nortel DMS 500	Nortel DMS 500
Network Establishment	1995	1996
Business Target Markets	Middle market and high-end users, ISPs.	All business customers, large and small.
Residential Target Markets	Not currently targeting	Not currently targeting
Geographic Areas	Throughout the metropolitan area. Central Phoenix, Tempe, Mesa, Chandler, Glendale, Paradise Valley, Tolleson, Gilbert.	Downtown Phoenix and Southern Arizona
Competitive Alliances	Partnership with Salt River Project (local utility provider) in Phoenix	Formed Phoenix Fiber Access with ICG in 1995. Purchased ICG half in 1997.

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QUALITY STRATEGIES
Washington, D.C.
(703) 610-1000

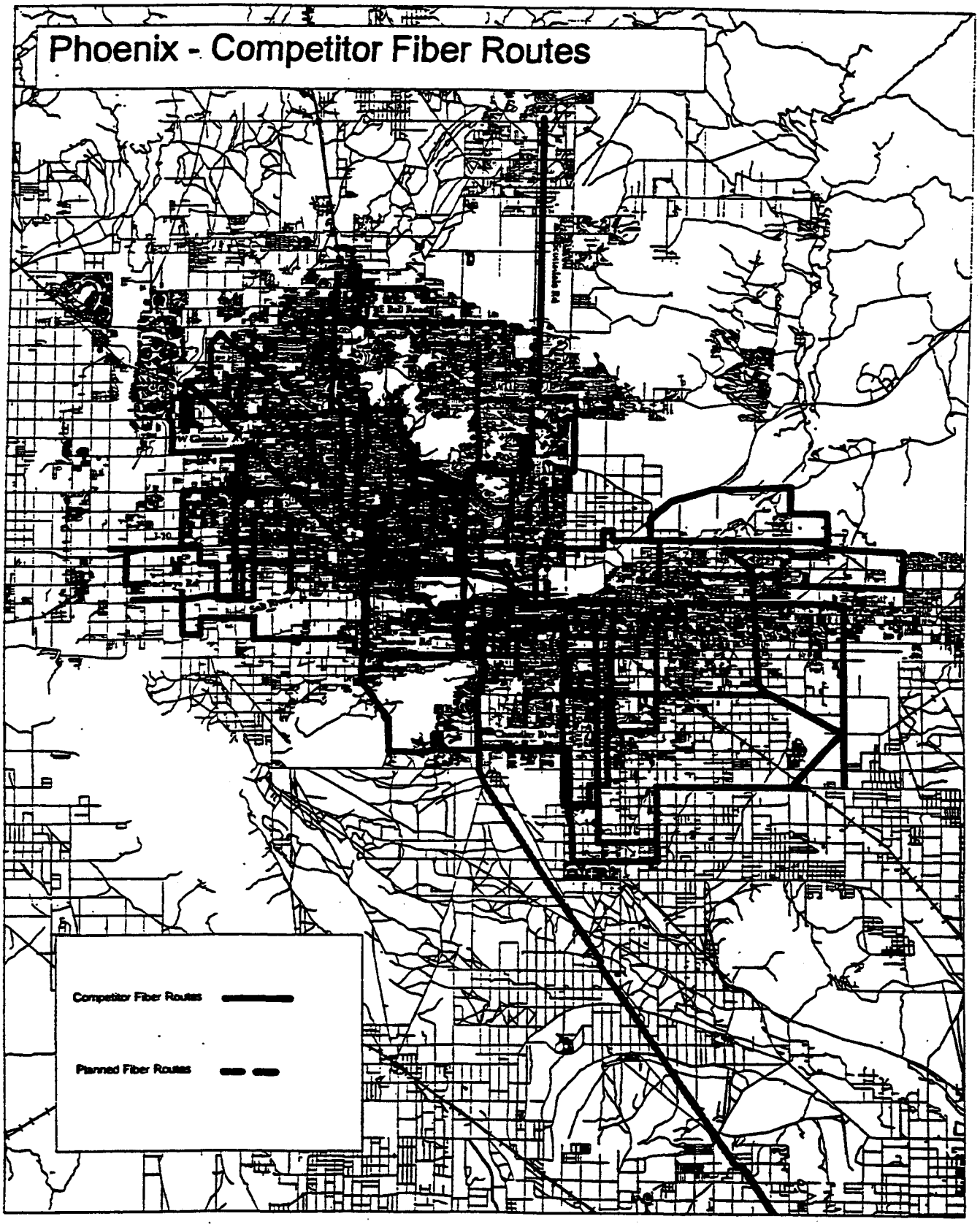
COMPETITOR CAPACITY

In recent years, U S WEST has become particularly vulnerable to losing additional Provider Market share due to the relative ease of switching providers (from both the wholesale and retail perspectives). During the initial infrastructure deployment, CAPs overbuilt their networks to meet the anticipated bandwidth demands of the future. Therefore, CAP networks are equipped with significantly more capacity than is currently being utilized. In fact, many industry analysts feel that several competitors are using only a small fraction of theoretical network capacity at the present time.

Two facets of CAP network construction generally contribute to their enormous capacity: 1.) the use of 144 strand optical fiber cable and 2.) adherence to SONET ring architecture. By using 144 strand cables, CAPs are capable of operating 36 "systems" across their networks (assuming a system is comprised of 4 individual fiber strands). The use of SONET ring network architecture allows CAPs to install self-healing rings that are connected, yet function independently - thereby increasing overall network capacity as rings are added to the network. Because CAPs have made several capacity allowances in the construction of their metropolitan area networks, they are able to grow and add circuits without necessitating frequent upgrades. In other words, there is a low marginal cost (from a capacity standpoint) associated with adding customers and circuits. To further facilitate the migration of traffic from RBOC facilities to competitive networks, CAPs frequently waive installation charges for new circuits.

As is the case with Provider high capacity circuits, CAPs will have little difficulty assuming Transport traffic from IXCs and other carriers. Generally, CAPs install extraordinary amounts of capacity around long distance POPs, U S WEST central offices, and competitive switching centers because of the enormous amount of traffic that originates and terminates at these facilities. In all likelihood, only a fraction of that capacity is currently being utilized and CAPs have the capability to assume Transport circuits without upgrading network capacity.

See the following page for a map of the competitor fiber routes.



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Several factors contribute to network capacity, including the type of fiber used, transmission software, the number of SONET rings deployed, and the number of nodes in operation. The following table is designed to provide the basic competitor facilities that contribute to the overall capacity of a network. According to QUALITY STRATEGIES estimates based on U S WEST-supplied aggregate data (including DS-1, DS-3, and optical circuits used for end user traffic and transport), U S WEST currently operates approximately 85,700 DS-1 equivalents. The existing CAP networks could easily handle all U S WEST traffic (including optical circuits) by having only three systems activated in each CAP network (or less than 8% of total capacity).

In this case, we are defining a system as consisting of four individual fibers. Since CAPs generally install 144 strand fiber in their backbones, it is possible to have 36 systems under this arrangement. Assuming that each fiber ring runs at optical speeds (OC-3 through OC-48) and that all backbone rings are comprised of 144 strand fiber, the competitive networks in Phoenix (taken together) could handle all U S West traffic at less than 8% capacity. Please refer to the table below for a detailed description of CAP capacity in Phoenix.

Network capacity estimates are calculated based on the following inputs: Backbone speeds (which vary from ring to ring), and the number of SONET rings. The number of equipment sites was not taken into account for the calculation of network capacity. Please refer to the following page for a table illustrating competitive network capacity.

COMPETITOR CAPACITY

	TCG	WorldCom	MCI	ELI	GST	Total
Maximum Backbone Speed (in OC-n)	48	48	48	48	48	N/A
Approximate Percentage Operating at OC-48	75%	100%	100%	80%	75%	N/A
Other Backbone Speed (in OC-n)	12	0	0	12	12	N/A
Approximate Percentage Operating at that Speed	20%	0%	0%	20%	20%	N/A
Other Backbone Speed (in OC-n)	3	0	0	0	3	N/A
Approximate Percentage Operating at that Speed	5%	0%	0%	0%	5%	N/A
Average Backbone Speed (in OC-n)	38.55	48.00	48.00	40.80	38.55	N/A
SONET Rings operational in network	10	4	3	7	3	27
Approximate Capacity in OC-n	386	192	144	286	116	1,123
Approximate Capacity in DS-1 Equivalents*	10,794	5,376	4,032	7,997	3,238	31,437
Capacity Assuming 1 Systems	10,794	5,376	4,032	7,997	3,238	31,437
Capacity Assuming 3 Systems	32,382	16,128	12,096	23,990	9,715	94,311
Capacity Assuming 5 Systems	53,970	26,880	20,160	39,984	16,191	157,185

*Note: Approximate Capacity in DS-1 Equivalents is calculated by multiplying the above OC-n value by 28.

The average backbone speed of each competitor's network is derived by using the weighted averages of the various network speeds used in their network. The average backbone speed is then multiplied by the number of SONET rings operating in the network. The product is then multiplied by 28 to get the DS-1 equivalent. Examples of capacity are therefore provided based on the assumptions regarding the number of operational systems.

CONCLUSIONS

To date, U S WEST has lost approximately 23% of the High Capacity Market. This market includes both the Provider Market (consisting of special access and point to point circuits) and the Transport Market (consisting of circuits connecting POPs and local exchange COs).

Currently, U S WEST's share of the Provider Market is approximately 72%; down from 94% in the fourth quarter of 1994. Competitors have chipped away at U S WEST's market share through facilities buildout and alliances with interexchange carriers. Traditionally, U S WEST's facilities-based competitors have targeted its most valuable accounts - bandwidth-intensive large businesses. Because of this, CAP competitors have captured a greater percentage of the DS-3 (45 Mbps) market than the DS-1 (1.5 Mbps) market.

From a retail perspective, U S WEST maintains a billing relationship with fewer than 30% of all high capacity circuits. In other words, CAPs and IXCs maintain the end user relationship for 70% of special access high capacity circuits despite the fact that U S WEST currently provisions over 70% of these circuits.

While U S WEST's share of the Transport and Wholesale Markets are higher than its share of the Provider Market, recent incremental losses indicate that the figures may achieve parity in the near future. As of the fourth quarter of 1997, U S WEST accounts for 84% of the Transport market, down from 94% in the second quarter of the same year (six months earlier). Along the same lines, U S WEST's share of the Wholesale Market had dropped to 79% in fourth quarter 1997. Much of this share loss can be attributed to the realignment of carriers and an IXC desire to minimize the amount of business it conducts with U S WEST.

There is every indication that erosion of U S WEST's share of the Phoenix High Capacity Market will continue. Both U S WEST's relatively low Retail Market share and the enormous amount of unused capacity in competitive networks make it highly likely that U S WEST's share of the Provider and Transport Markets will continue to decline. This decline is expected to be exacerbated by continued consolidation in the telecommunications industry (e.g., the merger of AT&T and TCG).

APPENDIX

METHODOLOGY OVERVIEW

MARKET SHARE SUMMARY OVERVIEW

Market share results for Provider and Retail Market are based on actual usage obtained from surveys and invoice analyses. Market share results for this project are based on customer usage as of the fourth quarter of 1997. The following steps illustrate our process for delivering end user Provider and Retail market share results for U S WEST:

STEP 1: COMPETITOR AND INDUSTRY ANALYSES

Multiple inputs to sampling approach and sample plan, including competitor research, proprietary regional and national databases, and pre-survey screeners.

STEP 2: ESTABLISH SAMPLE PLAN AND QUOTAS

Develop preliminary market share estimates, establish quotas for appropriate strata, including high penetration and low penetration strata, and sub-strata (demographics, spending levels, etc.).

STEP 3: DEVELOP AND SELECT SAMPLE

Develop and select stratified random sample from sampling frame constructed from multiple sources, including third-party lists of businesses and proprietary databases.

STEP 4: CONDUCT FIELDWORK

Collect survey data and invoices. Based on the quotas established in the sampling plan, we conduct fieldwork to collect three inputs - short form surveys, long form surveys, and invoices - on which market share results ultimately are developed.

Achieve quotas for strata, and supplement with additional interviews for low incidence strata. Calibrate self-reported data with appropriate invoice bias factors.

STEP 5: ANALYSIS AND REPORTING

Analyze survey data and invoice data, and develop final results.

SAMPLING METHODOLOGIES

We develop our sampling plan using stratified random sampling techniques, which provide for efficient statistical estimates by designing the sampling plan based on particular strata (e.g., mix of utilization of competitors, demographic characteristics, geographic location, etc.) that we have developed and successfully applied over the past ten years. We utilize a mix of random and targeted surveys based on the stratified random sampling techniques. We use the random surveys to qualify respondents for different quotas established in our sampling plans. We also use the data obtained in the random surveys to establish weights for different strata when we reconstitute market share results.

SOURCES OF MARKET SHARE DATA

Market share results are based on data acquired from multiple sources, including surveys, customer invoices, and competitor research. We use our standard HICAP survey to collect data from business customers. QUALITY STRATEGIES surveyed business customers regarding their usage of high capacity DS-1 and DS-3 services. The survey includes questions on all competitive DS-1 and DS-3 services, including CAP fiber-based services, microwave services, satellite services, and customer-owned facilities. We also use surveys to collect demographic information, perception data, and other information not available on customer invoices.

We acquire customer invoices (RBOC, CLEC, CAP, IXC, and other competitive services) to provide market share results that are based on actual customer usage. We collect customer invoices to validate self-reported data and to calibrate reconstituted market share results based on actual customer expenditures and to correct for over- and under-reporting. On an aggregate basis, we analyze differences between survey and invoice data to develop and utilize bias estimates when calculating market share results.

STATISTICAL VALIDITY

This project is designed to provide estimates of high capacity (DS-1 and DS-3) share that are statistically valid for U S WEST's overall high capacity services compared to competitive alternatives. Sample sizes are designed to achieve statistically valid market share results for the Phoenix MSA.

High capacity (Provider and Retail) market share results for the Phoenix MSA are based on a 95% confidence level with ±5% margins of error. Estimates for particular types of high capacity services (i.e., disaggregated results) are likely to have a higher margin of error. Trend results are based on a consistent methodology across time periods.

COMPETITOR RESEARCH OVERVIEW

The competitive analysis is comprised of information gathered by QUALITY STRATEGIES' analysts for two separate "CAP/CLEC Network Descriptions" projects commissioned by U S WEST in the third and fourth quarters, 1997. Competitive information is gathered from numerous sources (both primary and secondary) including the following:

- Interviews with CAP/CLEC and IXC professionals, including marketing, sales, administrative, executive, and technical personnel
- Interviews with large business end users
- Interviews with equipment vendors and equipment retailers
- Secondary market research including on-line sources and public information
- QUALITY STRATEGIES' extensive, national competitor database that has been maintained and updated continuously over the last ten years

HIGH CAPACITY MARKET SHARE

High Capacity Market share is based on all end-user DS-1 and DS-3 services, including Special Access and Point-to-Point (exchange) circuits as well as transport circuits (measured in DS-1 equivalents).

Prior to 2Q97, Quality Strategies had been providing U S WEST with HICAP Track results for providers offering facilities-based service. Thus, no resellers have been included in Provider Market results. Since 2Q97, Quality Strategies has been presenting Provider results in addition to Wholesale and Retail Market results. Each set of results is clearly documented to indicate whether it encompasses facilities-based provider results; retail results that include resellers, or wholesale results.

QUALITY STRATEGIES uses DS-1 equivalents as the basis for market share estimates. Market share is provided for each service provider in terms of the percentage of DS-1 equivalents provided. Specific steps used to determine DS-1 equivalent share for each competitive category are as follows:

A. **Determination of DS-1 Equivalents.** High Capacity market share is provided on a DS-1 equivalent basis. All circuits are expressed in terms of 1.544 Mbps. QUALITY STRATEGIES uses the following calculations to determine DS-1 equivalent share:

- One (T-1) DS-1 Circuit = One DS-1 Equivalent
- (T-3) DS-3 Circuits: Number of DS-3 Circuits x 28 = Number of DS-1 Equivalents

B. **Determination of DS-1 Equivalents Percentage Share.** DS-1 equivalents are totaled, and share is presented based on the percentage of the total each carrier provides.

Retail v. Wholesale. As stated previously, retail circuits are sold to end users. Wholesale circuits are provided to CAP/CLECs and IXCs for resale to end users. For example, a U S West circuit could be sold to AT&T (and paid for by AT&T), but resold to AT&T long-distance customers for special access to the AT&T POP. In this case, the end user is billed by AT&T although the circuit is provisioned and maintained by U S West. In this scenario, U S West receives Provider and Wholesale Market share for the circuit while AT&T receives Retail Market credit. Share of the Wholesale Market includes both end-user and transport circuits.

QUALITY STRATEGIES provides market share estimates based on DS-1 equivalents. Market share is provided for each service provider in terms of percentage of DS-1 equivalents provided.

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POWER Engineers, Inc. Report

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PHOENIX FIBER STUDY
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X. AFFADAVIT

EXECUTIVE SUMMARY

POWER Engineers, Inc. (PEI) has developed a cost model for the purpose of estimating the construction and equipment costs for Competitive Access Providers (CAPs) in the Phoenix, Arizona MSA, to displace existing U S WEST Communications (U S WEST) hi-cap services (DS1 and greater bandwidth). The model estimates the cost of extending fiber-optic cable links from existing CAP backbone fiber routes to current U S WEST hi-cap customer locations (locations), based upon the airline distance from the location to the nearest CAP route. The model also includes the equipment and labor costs to terminate circuits at the locations, duplicating the service level now provided by U S WEST.

Major cost elements in the model are:

Structure costs - the aerial line or buried conduit path for the cable.

Access costs - to access the CAP fiber cable and the customer building.

Cable costs - including installation from the customer location to the CAP fiber route.

Equipment costs – including installation at the customer location plus incremental items needed at the CAP hub.

The model provides "broad-gauge" costs, sufficiently accurate for capital budget planning for constructing connections to a large number of locations, but not suitable for site specific costs. To develop the cost model, costs were divided into distance sensitive elements, such as the length of the fiber cable for each location, and non-distance sensitive elements (at the distances assumed in this study), such as transmission equipment.

Distance sensitive cost factors were developed by grouping locations into distance bands by airline distance from the nearest CAP fiber route. Then a random, statistically valid sample of locations in each band was surveyed. Probable paths to the CAP routes were determined and distances were measured for each sample. Physical factors which contribute to costs were noted, such as type of structure (aerial or below ground), surface or aerial line conditions, etc. Detailed cost estimates were developed for each sample location. Average path costs per location by distance band for the locations in the sample were computed for application to the total population of U S WEST service locations. Path costs were calculated on the basis of a single entrance path to each customer location.

Non-distance sensitive cost algorithms, consisting of equipment costs including installation, were developed on the basis of the type and number of services provided. Automatic alternate route protection was assumed where service requirements exceeded three DS1's. This provides switching to an alternate path on the backbone fiber ring, should a failure occur on the primary backbone path.

Estimates of construction time per location were also developed. The average time per location is estimated to be two weeks. Considering probable actions by local governments to minimize traffic disruptions and other public inconveniences, it is estimated that a 100% buildout would require

two-and-a-half to three years. A build, which took in the 49% of customer locations within 1,000 feet of an existing CAP fiber route, is estimated to require one-and-a-half to two years.

An assessment was also made of the wireless alternative for providing hi-cap services.

Cost Model results are summarized in the table below:

DISTANCE BAND (IN FEET) FROM NEAREST CAP FIBER ROUTE	NUMBER OF LOCATIONS WITHIN THE BAND	% OF TOTAL LOCATIONS WITHIN THIS BAND	AVERAGE COST PER LOCATION	TOTAL COST FOR ALL LOCATIONS IN THE BAND
0 TO 1,000	1,508	48.63%	$29,596	$44,631,239
1,001 TO 2,000	578	18.64%	$33,211	$19,195,750
2,001 TO 4,000	561	18.09%	$54,667	$30,668,367
4,001 TO 9,000	454	14.64%	$71,126	$32,291,231
ALL LOCATIONS	3,101	100%	$40,886	$126,786,587

II

STUDY OBJECTIVES

A. Fiber-Optic Cable Costs:

Develop a broad-gauge engineering assessment of the costs for Competitive Access Providers (CAPs) in the Phoenix, Arizona MSA, to displace existing U S WEST hi-cap services (DS1, DS3, OC-3, OC-12, OC-48) by extending fiber-optic cable links from existing CAP fiber routes to current U S WEST hi-cap customer locations (locations). This includes the provision of automatic, alternate routing where service requirements exceed three DS1's.

B. Wireless Transmission:

Review the potential for CAPS to utilize wireless transmission as an alternative means of providing hi-cap services.

III

ESTIMATING METHODS AND ASSUMPTIONS
FIBER-OPTIC PATH COSTS

TASK:

Develop a broad gauge engineering assessment of the costs for the path from a customer location to the nearest CAP fiber cable route.

DESCRIPTION:

These are the costs from each location to the nearest access point on the nearest CAP fiber route. This includes the cost of the structure, which carries the fiber-optic cable, the cost of the cable, and the cost of placing and splicing the cable.

The cost of the structure is the largest cost element. Many variables determine structure costs, the most significant being the distance and the type of structure. Structures assumed in this study were either aerial (typically joint use on an existing aerial line), or below ground in conduit.

Unit costs ($/ft) for aerial structure vary based upon whether there is an existing, adequate joint use line, or whether the line must be reinforced or extended, or be newly built. Variables which drive unit costs for below-ground conduit include the type of surface (e.g. asphalt, concrete, sod, etc.), the type of soil (e.g. sand, calciche, rock, dirt, etc.), the type of construction (e.g. trenching, boring, plowing, etc.), the depth at which the cable is to be placed, the location of existing buried utilities (sewer, water, gas, etc.), backfill requirements, restoration requirements, the need for additional utility holes to access backbone routes, and permitting costs. Other impacts, such as the need to perform work during non-peak traffic hours, may apply, depending on the jurisdiction and the season.

Fiber cable costs were based on length calculations; described below; multiplied by a cost per foot loaded to include estimated costs of installation.

ASSUMPTIONS:

Building entrances – it was assumed that each location will require a new building entrance, whether aerial or below ground.

Path types – it was assumed that the mix of aerial versus buried plant identified for locations sampled, could be applied to the entire population of customer locations, again, by distance band.

Depths for below ground paths – a depth of four feet from the surface was assumed.

Joint paths for adjacent locations – a portion of most paths from backbone routes to locations are shared between adjacent locations, or among multiple locations that lie near a common path. It was assumed, on the basis of the experience of a knowledgeable local contractor, that on average, path costs developed on a "stand-alone" basis for each location, should be reduced 40% to reflect this cost sharing effect, to reach a true average path cost per location.

Access to backbone routes - it was assumed that a utility hole would need to be added for splice access to the backbone fiber route, for buried paths, if there were no observable access points within 500' of the point on the backbone fiber nearest the probable path to the location.

Utility holes – for most locations, access to the existing CAP fiber route is readily available via existing utility holes or aerial splice enclosure. However, in many cases access would require placing a new utility hole. The proportion of sample locations, by band. for which additional utility holes would be needed, was calculated. This proportion was applied to the total population of locations within the band to the utility hole component of total path costs.

Utility hole sharing among multiple paths – every splice in a fiber-optic cable creates a loss of signal strength. To minimize these losses, the number of splice locations along backbone fiber routes must be minimized. This requires that the number of access points for paths to customer locations also be minimized. As a result, each access point along the route is typically used to connect multiple paths leading from the backbone route to customer locations. It was assumed. on the basis of PEI's experience and that of a local contractor, that on average, four paths to locations would be connected to the backbone route at each utility hole. To account for this sharing factor in the cost calculations, utility hole costs developed for "stand-alone" paths were multiplied by 25% to yield an average utility hole cost per location.

Utility hole summary – the observations outlined above led to a procedure in which average utility hole costs per location for all of locations, by airline distance band, were derived by multiplying the cost of a single hole by two factors. First, the cost of a hole was multiplied by the percentage of locations requiring a new hole, and then by a factor to account for sharing of holes by multiple paths (see Item 12, ESTIMATING PROCEDURE below for other utility hole cost calculations).

Fiber-optic cable - it was assumed that 24-fiber count, single mode fiber-optic cable would be used to connect the locations to the CAP fiber routes. This size provides adequate facilities for the four-fiber connections necessary for automatic alternate routing, plus growth. A local contractor advised that this is a typical size and type used for this purpose. Note that frequently, a larger size may be used for some distance from the backbone route, when several customers are located in adjacent quarters. Because the unit costs (cost per foot per fiber) drops as size increases, actual cable costs per customer are lower than those calculated for the study.

ESTIMATING PROCEEDURE:

Structure Costs:

It was noted that algorithms could readily be applied via computer, to the entire population of locations in U S West's data base, which would identify the airline distance from each location to the nearest CAP fiber cable route. PEI elected to develop a cost estimating model related to this airline distance, which could then be readily applied to the entire database via software. Even though actual path lengths vary significantly from the airline distance, by costing a statistically valid number of randomly selected sample locations in

each band. an average path cost by band can be established with sufficient accuracy for overall budget planning.

Throughout the process, the experience of PEI and an experienced local contractor were used to develop estimates and assumptions.

The process used was as follows:

1. U S WEST's geographic databases of hi-cap service locations and CAP fiber-optic cable routes were provided to Power Engineers (PEI). Data included the address, and the number and type of hi-cap services by location, and the running lines of CAP "backbone" fiber routes.

2. PEI distributed the locations into one thousand foot distance bands from the nearest CAP fiber route, e.g. 0 to 1,000 ft; 1,001 to 2,000 ft, etc., using geographic information systems (GIS) software.

3. It was observed that more than half of the locations were within 1,000 ft of a CAP fiber route, and that the population fell rapidly with distance, fewer than 10% being beyond 4,000 ft. This led PEI to assume that CAPs would be unlikely to extend fiber beyond 9,000 feet, since costs increase with distance and there are few such locations.

4. A first approximation was made of path cost variation within each band for the purpose of setting initial sample size. This was based on estimated variations in distance within the band from the location to the nearest access point on the nearest CAP fiber route, and from the expected variation in unit costs for the different types of construction and terrain.

5. The rough estimate of potential cost variation by band was used to determine the number of sample locations to be studied within each band, to achieve a 95% confidence level for the average path cost within the band. The rough estimate was later validated and refined, based on cost variations observed among the sample locations.

6. The appropriate number of sample locations was chosen in each band using a random process.

7. Field visits were made to each location in the sample to obtain site specific data:

   Distance along a reasonable path from the property line of the location to the nearest access point on the nearest CAP fiber route (see assumptions, above).

   Type of access to backbone route - would a utility hole need to be added?

   Distance from the property line to the nearest building wall at the location.

   Distance from the building wall to the equipment room was estimated to be half the width of the building.

Type of structure

Type of surface conditions for cases involving conduit

Type of building entrance (aerial or conduit)

8. A site-specific cost estimate was obtained from a qualified local contractor for 50% of the sample locations.

9. The contractor and PEI personnel then reviewed the site specific estimates and related them to the type of structure (aerial or buried), permitting jurisdictions, and path length sections by surface condition (asphalt, concrete, sod, etc.). Unit cost factors were developed for the various jurisdictions and path conditions. Cost estimates for the remaining samples were then made by applying the unit cost factors to the path data acquired for the remaining locations.

10. Statistical indicators (average, standard deviation, median, and total variation) were determined for path costs within each band and the initial estimates of sample size by band were validated and revised, as indicated.

11. The average cost for each band, reduced 40% for common structure usage (a path segment used to connect more than one adjacent locations to the backbone route, see second paragraph under "Assumptions" above), was used as the path structure cost for all locations within the band which were not sampled.

12. Costs for utility holes which would need to be added to the backbone routes for access were calculated as follows:
    - Cost per hole was estimated at $8,000
    - Percent of locations by band needing a hole was determined from samples.
    - Utility hole costs per path were then multiplied by 25% to reflect that, on average, four paths share each hole (See ASSUMPTIONS, Utility hole costs, above).

    The resulting calculation of an average utility hole cost per location, by band, was:

    (Cost per hole) * (% of locations in band needing a hole) * (25% sharing factor)

    Example, for the 0 to 1,000 foot band:
    $8,000*33.9%*25% = $678, average utility hole costs per location in the band.

Cable Costs:

1. An Average cable length for each band was developed from the sample locations. The total distance from the access point on the nearest CAP route to the estimated location of the equipment room at the customer location was computed for each sample location within each band.

2. These average lengths for each band were then multiplied by the unit cost of fib loaded to account for placing, splicing and other costs.

3. This average cable cost by distance band is the estimating factor for cable costs for all customer locations within each particular band.

The sample locations, grouped by distance band, and the specific path cost estimates for each, are displayed in Chapter VIII, the Appendix, Section B. PATH COSTS. This Section also provides the average path cost for each band. These average path costs by band are applied to all locations, in the attached Cost Model, displayed in the Appendix, Section D., TOTAL COSTS.

IV

ESTIMATING METHODS AND ASSUMPTIONS
EQUIPMENT COSTS

TASK:

Develop an economical method of estimating costs for capital budgeting purposes, for the equipment required to provide the indicated service, using fiber-optic cable as the transmission medium.

DESCRIPTION:

This includes the equipment at the customer location required to provide the service, plus the incremental equipment at the CAP hub necessary to interface with the equipment at the customer location.

For each of the service types under consideration, equipment costs for the first circuit typically include "common equipment" which enable a number of similar circuits to be provided quickly, and at little additional cost. For DS-1 service, for example, the cost to provide 24 DS1 circuits over fiber cable is very little more than the cost to provide a single DS1 circuit, because the same amount of common equipment must be installed in either case.

Equations to describe these costs take the approximate form of the equation for a straight line, $y = mx + b$, for a range of circuit volume (groups of twenty-four in the case of DS1 circuits). In the DS1 example,

y = the equipment costs at the location
b = is the cost of the common equipment necessary to support a group of up to 24 DS1 circuits
m = the incremental cost per DS1, and
x = the number of DS1 circuits provided

The factors "m" and "b" change for various ranges of volume of DS1 circuits (similar for other bandwidths), requiring that different formulas be chosen based upon the circuit volume. This is because as circuit volume increases, it becomes economic to utilize higher capacity equipment, with different unit cost characteristics.

Although single DS1 circuits, for example, can be provided without placing the common equipment required to support twenty-four DS1's, this is rarely done because the "break even" point is very low. When growth occurs, per circuit costs on the "one-at-a-time" basis far exceed the costs of planning for groups of twenty-four.

Equipment is also required at the CAP hub to interface with each circuit installed at the customer premises.

PEI developed the formulas to fit each circuit type and volume by obtaining equipment costs from manufacturers and by estimating loadings for installation with the aid of a consultant with expertise in the field.

ASSUMPTIONS:

1. A Central Office or equivalent is in place and contains the higher order DS1 to OC-n equipment for distribution to a customer. The higher order transmission equipment is assumed to be in a "protected ring" configuration

2. The service is delivered to the customers premise via fiber cable. Four fibers will be assigned per system when service levels exceed three DS1's, two primary and two alternate route fibers. Automatic alternative route switching equipment is included, again, when service levels exceed 3 DS1's at a given location. All equipment will be protected against system card failure.

3. The loaded cost in the "hub" or C.O. is defined as the incremental equipment added to an existing system to facilitate the service. EG: Tx/Rx fiber cards, fiber jumpers, jack and frame interconnect, etc.

4. From one to twelve DS1 circuits are delivered via a fibered, Quad DS1 system, which delivers four circuits per Quad DS1 system.

5. When thirteen to 56 DS1's are required, a fibered DS3 multiplexer will be placed. The pricing shall include hub transceivers and customer premises common equipment plus incremental DS1 cards at the customer location up to a maximum of 28 DS1's per DS3 system.

6. When more than 56 DS1's are required, a fibered OC-3 system shall be placed. Pricing shall include hub transceivers and customer premises common equipment, plus incremental DS1 cards at the customer location up to a maximum of 84 DS1's per OC-3 system.

7. When a mix of DS1 and DS3 services are required, an OC3 or higher rate system will be placed. The pricing shall be incremental for each DS1 and DS3.

8. DS3 only: from one to three DS3's - an OC3 system will be placed. Pricing shall include hub transceiver plus customer premises common equipment, plus one DS3 card per circuit, to a maximum of three per system.

9. DS3 only: from four to twelve DS3's - an OC-12 system will be placed. Pricing shall include hub transceiver plus customer premises common equipment, plus one DS3 card per four DS3 circuits, up to a total of twelve DS3's per OC-12 system.

10. DS3 only: more than twelve DS3's - an OC-48 system will be placed. Pricing shall include hub transceiver plus customer premises common equipment, plus one DS3 card per four DS3 circuits, up to a total of 48 DS3's per OC-48 system.

11. When an OC3 or higher bandwidth service is required, a one-to-one configuration will be added. EG: an OC3 driver at the hub and an OC3 Tx/Rx at the customer premise.

12. When a higher order service is required (OC-3, OC-12, etc.), the hub location will always contain a system with enough bandwidth to accommodate the customer via

system cards. EG: an OC-3 requirement will be fed with an OC-12 system requirement with an OC48 system.

13. The distance from hub to customer is short, less than 10,000 ft. All distribution cable is in place, terminated at distribution panels, and tested for performance at the hub and customer locations.

14. No Wave Division Multiplexer or any other "fiber bandwidth gaining" device shall be used to serve the customer. All fiber drivers shall be LED (Light Emitting Diode), low power, 1310 nm.

15. All pricing is loaded and consists of the following:

    a. Equipment - customer location - shelf, common cards with protection, cabling, customer electrical interface, fiber jumpers, power and LED drivers. If service requirements exceed three DS1's, high speed interface cards and high speed switching cards are included for automatic route protection switching.
    b. Equipment - hub location - system cards, fiber jumpers.
    c. Engineering - both locations. Includes drawings, site survey, records, and assignments.
    d. Installation - both locations. Includes unpacking, inventory, inspection, mounting, cabling (copper and fiber), cable continuity, system power up, updating records and cleanup of area.
    e. Test and turn-up - both locations. Includes all system operations, alarms, end to end performance and interconnect to demarcation.
    f. Maintenance - a factor is added to cover call outs and routine updates.
    g. Performance Monitoring - a factor is added to support the addition of the service to the Network Operations Center.
    h. Taxes and transportation are included in the loaded cost.

16. All customer premise equipment is AC powered. Uninterrupted Power Source (UPS) is not included.

17. No particular vendor is specified in this study. All pricing was derived from list prices with an average 15% (fifteen percent) discount, multiplied by a loading factor for installation. This method offers a median installed cost which may very by 5%, depending on local factors. To narrow the margin, several vendors have been researched.

18. All customer premise equipment will be placed in an environmentally controlled location.

19. All customer premise equipment will be slave timed by the hub, referenced to a stratum one timing source.

ESTIMATING PROCEEDURE - EQUIPMENT:

Methods for serving each type, volume and mix of services were examined.

1. Equipment prices, loaded for installation, etc., were developed, referencing a number of vendors.

2. Equipment configurations for each type, combination, and volume of service types were determined.

3. Pricing algorithms were developed for each type, combination and volume of service types.

4. Logic statements were written in a commercially available software, to allow the software to select the proper algorithm for the service required, at each customer location.

5. The algorithms were applied to the data for each location to determine the specific cost for each location.

6. These equipment costs were then added to path costs to estimate the total cost for each customer location.

The resulting equipment cost formulas were applied to all locations, along with logic functions to select the appropriate formula for each combination of service types and volumes. These formulas are described in detail in Chapter VIII, the Appendix, Section C. EQUIPMENT COSTS.

V

COST MODEL

The cost model is a programmed spreadsheet in a commercially available software (Microsoft Excel®). The procedure used is as follows:

1. All Phoenix Metro hi-cap customer locations in U S WEST's data base were distributed into distance bands from the nearest CAP fiber-optic cable route, as described in Section III above, and entered into the spreadsheet.

2. Path costs were estimated by applying the average path cost for each band, determined as described in Section III, to all locations in the band.

3. Equipment cost algorithms were entered for each type, mix, and volume of services.

4. Logic statements were programmed to drive the software to select the proper equipment cost algorithm to serve each customer location, based on the service requirements at the location. This yielded unique equipment costs by location.

5. Path and equipment costs were summed for each location and then by band.

The resulting costs are summarized in the Executive Summary above.

Costs for all locations are provided and summarized by band in the Appendix, Section D. TOTAL COSTS - FOR ALL LOCATIONS, BY BAND.

BUILD TIME AND BUILD STRATEGIES

DEFINITION: The time required to build facilities and turn up service to a customer location is defined for this purpose as beginning at the time engineering is commenced, until service is turned up. This includes the time required to do the engineering, acquire digging permits and other rights-of-way, build the structure, install and terminate the cable, test the cable; and install, test and turn-up the equipment, and perform any hub or distant end functions which may be required. It is assumed that a suitable, environmentally controlled equipment space is available at the customer location.

The timetables outlined below are in the context of normal conditions. This means normal approval processes and time intervals for permits to use the public rights-of-way and other right-of-way acquisition, for traffic control measures, etc. It also contemplates normal concerns for the economics of construction - a balance between construction speed (the number of crews which can be efficiently managed simultaneously) and construction costs (use of only the best crews, at a rate that can be managed for maximum efficiency). If there were a crisis or emergency condition in which the continuity of data communications were in jeopardy, the time to build could be shortened considerably from the intervals outlined below.

TIME REQUIRED TO BUILD TO A SPECIFIC LOCATION - VARIATIONS:

The time required to build to different sites may vary significantly. Differences in build times are driven primarily by variations in the paths, such as length, digging conditions, etc. However, given a large number of sites to build to, an average time of two weeks per site can be managed economically in the Phoenix area. This is based on the experience of a qualified Phoenix contractor.

Applying more labor and equipment can shorten this time, but unit costs rise because of inefficiencies related to crowded work site conditions and the number of construction crews (simultaneous different construction locations) which can be effectively managed. Many factors that influence build time are beyond the control of the building party. These include governmental intervals for issuance of digging permits, Blue Stakes intervals (location of existing utilities), time required by owners of existing utilities to rearrange or safeguard them, limitations imposed by governments on construction activity in order to maintain public safety and convenience, etc.

The customer locations in the U S WEST database are widespread, but large concentrations of them are located along major business corridors. Given traffic flow and other public safety and convenience factors, it is estimated that a major construction effort could result in reaching those 1,508 locations within 1,000 feet of an existing CAP fiber route, in 18 to 24 months. It is estimated that a total of 24 to 36 months would be required to reach all 3,101 locations included in the study.

It is expected that the first six weeks to two months of a major building program would be absorbed in the initial acquisition of rights-of-way, digging permits, locating activity and traffic control planning. Beyond this period, these activities for the next sets of locations can be pursued in parallel, during the same time that physical construction to the initial sites is underway.

BUILD STRATEGIES:

Equipment costs are proportional to the volume of services at a location, and therefore are also proportional to revenue potential. Path costs, on the other hand, are a function of distance and surface conditions, almost independent of the volume of services (and thus potential revenue). Net operating income could therefore be optimized by focusing on the largest service volume customer locations with the lowest path costs, generally those nearest to the existing CAP fiber routes. In fact, it is reasonable to assume that the layout of the existing CAP routes was developed to minimize the total distance to the maximum number large service volume customer locations.

A likely CAP build strategy would appear to involve several elements, all aimed at maximizing the number of services provided (revenue) while minimizing the total path distance (cost). Such a strategy could be focused on the following locations:

- Locations with high service volumes near the existing CAP routes. (Note that 50% of U S West customer locations are within 1,000 feet of these routes, and if the distance is extended to 2,000 feet, 69% of locations are covered.).

- Extend further from existing routes, prioritizing targets based on service volumes, distances and adjacent addresses (opportunity to share path costs with more than one location).

- Extend long distances only when service volumes are high and path costs are low (aerial paths for fiber cable, or DS1 service provided via wireless).

VII

ACCESS VIA WIRELESS FACILITIES

Several transmission facility options are open to a CAP seeking to provide service to a customer. These include leasing a circuit from U S West, connecting the customer to the CAP fiber-optic ring via a fiber-optic cable, and connecting the customer to the CAP network (either to a point on or near a fiber ring, or directly to a CAP hub) via microwave radio. The wireless alternative requires a clear line-of-sight between antennas and/or reflectors on the route.

One and two DS1 capacity radio systems are economical (roughly $20,000 per DS1 for spread-spectrum radio equipment, antennas and installation), and do not require the time-consuming licensing process. Transmission is relatively free from troubles induced by atmospheric disturbances at distances up to 6 miles, making them very attractive for rural and near-rural environments. However, obtaining zoning approval for the 2' to 3' dish antennas and the costs of antenna site leases can be a serious time and cost obstacle. These issues relegate the use of spread spectrum systems to locations at which circuits are not available for lease, or where new construction is required to furnish the service, and construction intervals are long and special charges apply.

Small numbers of DS1 circuits can also be provided by specialized common carriers, which lease 38gHz systems. Installation is typically prompt with a monthly lease cost near $300 per DS1. Antennas may be as small as an 18" dish mounted inoffensively behind a camouflage screen on the side or roof of a building. However, as in the case of spread spectrum systems, this alternative is usually employed only for locations for which existing circuits are not readily available. The cost of leasing a single DS1 circuit from U S West is about $350/month, and no zoning approvals, antenna site leases (sometimes required at both ends of the link), nor transmission power costs apply. Furthermore, the 38gHz systems are susceptible to rain fade during heavy thunderstorms. Route lengths are usually limited to about 3 miles (depending on terrain) to minimize atmospherically induced fade.

Digital radio systems are available for service at the OC-3 and greater levels, but their cost characteristics and large antennas (serious zoning issues) suit them more for long-haul transmission than for local use. These systems require FCC licensing on a per-link basis, which may involve significant lead-time.

The state-of-the-art in wireless systems is advancing rapidly. In addition to digital point-to-point radio, multipoint broadband radio systems now being developed (LMDS) promise economical alternative means of hi-cap transmission in the future.

To summarize, while leased circuits for small quantities of DS1's are often the economic choice in urban areas, and fiber cable is favored for its tremendous bandwidth capability; practical wireless alternatives are available, and are becoming increasingly competitive.

APPENDIX
DATA AND DATA SOURCES

I. Development of sampling process and sample sizes:
STATISTICAL METHODS, Snedecor and Cochran, Sixth Edition, The Iowa State University Press, pp. 516-517.

II. Structure Costs, including Building Entry and extension to Equipment Room:
Location Specific Cost Estimates by Frank Chilcoat of ECSI, Communicor, Inc., Phoenix, Arizona, Phoenix Area Construction Contractor

III. Cable Sizes and Types
PEI Experience
Frank Chilcoat of ECSI, Communicor, Inc., Inc., Phoenix, AZ

IV. Cable Costs
PEI Experience
Graybar Electric Co., Inc.
Frank Chilcoat of ECSI, Communicor, Inc., Inc., Phoenix, AZ
Lawrence Young, Former Design Engineer, GST Inc., Phoenix, AZ

V. Installation and Termination Loadings on Cable Costs
PEI Experience
Frank Chilcoat of ECSI, Communicor, Inc., Inc., Phoenix, AZ
Lawrence Young, Former Design Engineer, GST Inc., Phoenix, AZ

VI. Equipment Configurations and Costs
Donald M. Malagisi, R & L Electronics, Lakewood, CO., equipment broker and network design consultant.

VII. Build Time
PEI Experience
Frank Chilcoat, ECSI, Communicor, Inc.

VIII. Wireless Access Reference
PEI Experience
IEEE Proceedings, December, 1997, Volume 12, and pp. 1958-1972, M. Gagnaire: An Overview of Broad-Band Access Technology

APPENDIX
DATA AND DATA SOURCES

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A. SOURCES OF DATA AND SAMPLINGS METHODS

B. PATH COSTS - LOCATION SPECIFIC ESTIMATES FOR SAMPLES IN EACH BAND
EXCEL ® SPREADSHEET "PATHCOST.XLS"

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APPENDIX
DATA AND DATA SOURCES

B. PATH COSTS - LOCATION SPECIFIC ESTIMATES FOR SAMPLES IN EACH BAND
EXCEL ® SPREADSHEET "PATHCOST.XLS"

STANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1	PHX	222	5	0	0	0	11,000	233,300	244,300
2	PHX	1	0	0	0	0	11,000	5,468	16,468
3	SCTSDL	2	0	0	0	0	11,000	5,468	16,468
4	TEMPE	1	0	0	0	0	11,000	5,468	16,468
5	PHX	1	0	0	0	0	11,000	5,468	16,468
6	PHX	2	0	0	0	0	11,000	5,468	16,468
7	PHX	1	0	0	0	0	11,000	5,468	16,468
8	PHX	4	0	0	0	0	11,000	8,068	19,068
9	PHX	2	0	0	0	0	11,000	5,468	16,468
10	PHX	1	0	0	0	0	11,000	5,468	16,468
11	PHX	1	0	0	0	0	11,000	5,468	16,468
12	PHX	1	0	0	0	0	11,000	5,468	16,468
13	PHX	4	0	0	0	0	11,000	8,068	19,068
14	CHNDLR	2	0	0	0	0	11,000	5,468	16,468
16	CHNDLR	3	0	0	0	0	11,000	5,468	16,468
17	TEMPE	1	0	0	0	0	11,000	5,468	16,468
18	PHX	14	0	0	0	0	11,000	23,192	34,192
19	PHX	10	0	0	0	0	11,000	24,204	35,204
20	MESA	33	0	0	0	0	11,000	47,089	58,089
21	PHX	1	0	0	0	0	11,000	5,468	16,468
22	TEMPE	1	0	0	0	0	11,000	5,468	16,468
24	TEMPE	1	0	0	0	0	11,000	5,468	16,468
25	PHX	290	8	0	0	0	11,000	287,666	298,666
26	PARA VLY	1	0	0	0	0	11,000	5,468	16,468
27	PHX	3	0	0	0	0	11,000	5,468	16,468
29	SCTSDL	1	0	0	0	0	11,000	5,468	16,468
30	PHX	3	0	0	0	0	11,000	5,468	16,468
31	TEMPE	2	0	0	0	0	11,000	5,468	16,468
33	PHX	3	0	0	0	0	11,000	5,468	16,468
35	PHX	2	0	0	0	0	11,000	5,468	16,468
37	PHX	1	0	0	0	0	11,000	5,468	16,468
39	TEMPE	11	0	0	0	0	11,000	24,204	35,204
40	PHX	3	0	0	0	0	11,000	5,468	16,468
41	PHX	1	0	0	0	0	11,000	5,468	16,468
42	CHNDLR	5	0	0	0	0	11,000	16,136	27,136
43	SCTSDL	1	0	0	0	0	11,000	5,468	16,468
46	PHX	1	0	0	0	0	11,000	5,468	16,468
48	PHX	7	0	0	0	0	11,000	16,136	27,136
49	PHX	11	0	0	0	0	11,000	24,204	35,204
50	PHX	28	1	0	0	0	11,000	49,686	60,686
51	PHX	3	0	0	0	0	11,000	5,468	16,468

Cost Model - Competitive Access Providers
Developed by POWER Engineers, Inc. for US WEST Communic
Sample Locations

DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE								
52	PHX	3	0	0	0	0	11,000	5,468	16,468
57	SCTSDL	2	0	0	0	0	11,000	5,468	16,468
60	MESA	1	0	0	0	0	11,000	5,468	16,468
63	MESA	1	0	0	0	0	11,000	5,468	16,468
65	TEMPE	2	0	0	0	0	11,000	5,468	16,468
66	PHX	1	0	0	0	0	11,000	5,468	16,468
68	MESA	1	0	0	0	0	11,000	5,468	16,468
70	PHX	1	0	0	0	0	11,000	5,468	16,468
71	SCTSDL	1	0	0	0	0	11,000	5,468	16,468
72	TEMPE	4	0	0	0	0	11,000	8,068	19,068
75	PHX	1	0	0	0	0	11,000	5,468	16,468
76	PHX	2	0	0	0	0	11,000	5,468	16,468
89	P	3	0	0	0	0	11,000	5,468	16,468
93	PHX	1	0	0	0	0	11,000	5,468	16,468
94	MESA	2	0	0	0	0	11,000	5,468	16,468
100	PHX	3	0	0	0	0	11,000	5,468	16,468
104	PHX	8	9	0	0	0	11,000	89,748	100,748
105	PHX	3	4	0	0	0	11,000	60,150	71,150
				Sub-Totals			$649,000	$1,160,511	
							Sum of Total Cost		$1,809,511
							Average of Total Cost		$30,670

0 TO 1,000 FT FROM CLEC FIBER ROUTE, ID'S 1-52

ID	CITY	DS-1	DS-3	DIST, FIBER TO PROP	DIST, PROP TO BLDG ENTR.	DIST, BLDG ENT TO EQP ROOM	PATH TYPE	STRUC. COST	STR $ PER FT	FEET, TDIST	ID	MH	PATH COST	CABLE COST	TOT OSP COST
1	PHX	222	5	200	200	150	ACB	8,000	14.55	550	1	0	8,000	880	8,880
2	PHX	1	0	50	500	150	C	19,000	27.14	700	2	0	19,000	1120	20,120
3	SCTSDL	2	0	300	800	100	BUR	31,000	25.88	1200	3	8,000	39,000	1920	40,920
4	TEMPE	1	0	700	60	90	BUR	22,000	25.88	850	4	8,000	30,000	1360	31,360
5	PHX	1	0	150	15	125	C/B	7,500	25.88	290	5	8,000	15,500	464	15,964
6	PHX	2	0	400	50	150	C	13,800	23.00	600	6	8,000	21,800	960	22,760
7	PHX	1	0	100	100	100	ACD	9,500	31.67	300	7		9,500	480	9,980
8	PHX	4	0	100	500	150	A/C	21,000	28.00	750	8		21,000	1200	22,200
9	PHX	2	0	300	150	80	A/C	12,000	22.64	530	9	8,000	20,000	848	20,848
10	PHX	1	0	500	200	150	C/B	19,500	22.94	850	10		19,500	1360	20,860
11	PHX	1	0	100	100	200	A/C	14,500	36.25	400	11		14,500	640	15,140
12	PHX	1	0	150	50	100	A/C	10,500	35.00	300	12		10,500	480	10,980
13	PHX	4	0	50	10	50	A	8,000	72.73	110	13		8,000	176	8,176
14	CHNDLR	2	0	100	50	150	BUR	10,000	34.11	300	14	8,000	18,000	480	18,480
16	CHNDLR	3	0	600	80	125	BUR	20,500	25.66	805	16	8,000	28,500	1288	29,788
17	TEMPE	1	0	320	0	75	AER	5,500	14.39	395	17		5,500	632	6,132
18	PHX	14	0	150	1350	175	A/C/B	34,500	20.50	1675	18		34,500	2680	37,180
19	PHX	10	0	200	200	200	ACB	25,000	41.67	600	19		25,000	960	25,960
20	MESA	33	0	200	0	150	AER	5,000	14.39	350	20		5,000	560	5,560
21	PHX	1	0	360	50	100	BUR	13,500	26.89	510	21		13,500	816	14,316
22	TEMPE	1	0	600	625	75	BUR	26,500	20.50	1300	22	8,000	34,500	2080	36,580
24	TEMPE	1	0	220	120	25	BUR	12,500	34.11	365	24	8,000	20,500	584	21,084
25	PHX	290	8	600	600	100	A/C/B	29,000	22.31	1300	25		29,000	2080	31,080
26	PARA VLY	1	0	400	600	150	C/G	24,000	20.87	1150	26		24,000	1840	25,840
27	PHX	3	0	200	125	85	A/C/B	8,500	20.73	410	27		8,500	656	9,156
29	SCTSDL	1	0	300	75	100	A/C/G	15,000	31.58	475	29		15,000	760	15,760
30	PHX	3	0	300	300	120	A/C/B	16,500	22.92	720	30		16,500	1152	17,652
31	TEMPE	2	0	350	20	70	BUR	12,000	26.89	440	31	8,000	20,000	704	20,704

33	PHX	3	0	75	50	125	AC	8,000		250	33		8,000	400	8,400
35	PHX	2	0	125	50	100	ACB	9,500	34.55	275	35		9,500	440	9,940

0 TO 1,000 FT FROM CLEC FIBER ROUTE, ID'S 1-52

ID	CITY	DS-1	DS-3	DIST, FIBER TO PROP	DIST, PROP TO BLDG ENTR.	DIST, BLDG ENT TO EQP ROOM	PATH TYPE	STRUC. COST	STR $ PER FT	FEET, TDIST	ID	MH	PATH COST	CABLE COST	TOT OSP COST
37	PHX	1	0	800	300	100	ACB	26,500	23.75	1200	37	8,000	36,500	1920	38,420
39	TEMPE	11	0	40	40	80	BUR	11,500	72.00	160	39		11,500	256	11,756
40	PHX	3	0	350	225	125	A	16,000	22.86	700	40		16,000	1120	17,120
41	PHX	1	0	400	0	200	BUR	16,000	26.89	600	41	8,000	24,000	960	24,960
42	CHNDLR	5	0	800	250	100	AER	16,500	14.39	1150	42	8,000	24,500	1840	26,340
43	SCTSDL	1	0	200	130	70	AER	6,000	14.39	400	43		6,000	640	6,640
46	PHX	1	0	300	300	20	C	14,500	23.39	620	46		14,500	992	15,492
48	PHX	7	0	150	50	125	ACB	9,500	29.23	325	48		9,500	520	10,020
49	PHX	11	0	75	150	75	D	8,000	26.67	300	49		8,000	480	8,480
50	PHX	28	1	700	200	190	A/C	17,500	16.06	1090	50	8,000	25,500	1744	27,244
51	PHX	3	0	300	75	125	AER	5,500	11.00	500	51		5,500	800	6,300
52	PHX	3	0	50	250	200	A/C	23,000	46.00	500	52		23,000	800	23,800
57	SCTSDL	2	0	700	0	100	AER	11,500	14.39	800	57		11,500	1280	12,780
60	MESA	1	0	5	60	150	AER	3,000	14.39	215	60		3,000	344	3,344
63	MESA	1	0	200	0	200	AER	6,000	14.39	400	63		6,000	640	6,640
65	TEMPE	2	0	200	70	200	AER	7,000	14.39	470	65	8,000	15,000	752	15,752
66	PHX	1	0	900	300	200	A/G	32,000	22.86	1400	66	8,000	40,000	2240	42,240
68	MESA	1	0	125	45	85	A/C	7,500	29.41	255	68	8,000	15,500	408	15,908
70	PHX	1	0	900	400	75	A/C	32,000	23.27	1375	70		32,000	2200	34,200
71	SCTSDL	1	0	350	600	350	AC	31,000	25.86	1200	71	8,000	39,000	1920	40,920
72	TEMPE	4	0	100	700	200	AER	14,500	14.39	1000	72		14,500	1600	16,100
75	PHX	1	0	300	150	50	A/B	7,500	15.00	500	75	8,000	15,500	800	16,300
76	PHX	2	0	400	200	80	A/C/G	11,000	16.18	680	76	8,000	19,000	1088	20,088
89	P	3	0	350	125	50	AER	8,500	16.19	525	89		8,500	840	9,340
93	PHX	1	0	1000	120	40	AER	16,500	14.39	1160	93		16,500	1856	18,356

94	MESA	2	0	30	240	250	AER	7,500	14.39	520	94		7,500	832	8,332
100	PHX	3	0	500	129	250	AER	18,000	20.48	879	100		18,000	1406	19,406
104	PHX	8	9	250	150	200	BORE	35,000	58.33	600	104		35,000	960	35,960
105	PHX	3	4	600	500	200	A/C/G	33,000	58.33	600	105		33,000	0	33,000
	# SAMPLES =	59				STRUCT TOT =		925,600		MH TOT =		160,000	1,085,600	61,238	1,147,038
						STRUCT AVG=		15,692		AVG-=		2,712	18,403	1,038	19,441
	ADJUST FOR COMMON					STRUCTURE COST=				MH COST=				MEDIAN	17,652
	STRUCTURE AND				=	AVG * 60%		$9,415		AVG * 25%		$678		STD DEV	10,307
	COMMON MANHOLE USE													AVG	19,441
						TOTAL PATH COST AVG =				$11,131			SD % OF MEAN		53%

1,000 TO 2,000 FT FROM CLEC FIBER ROUTE

ID	CITY	DS-1	DS-3	DIST, FIBER TO PROP	DIST, PROP TO BLDG ENTR.	DIST, BLDG ENT TO EQP ROOM	PATH TYPE	STRUC. COST	STR $ PER FT	FEET, TDIST	ID	MH	PATH COST	CABLE COST	TOT OSP COST
23	PHX	1	0	1200	700	250	AC	35,000	16.28	2150	23		35,000	3440	38,440
28	PHX	6	0	1850	250	150	A/C/B	31,000	13.76	2250	28	8,000	39,000	3600	42,600
32	PHX	5	0	1600	120	180	BUR	33,500	17.68	1900	32	8,000	41,500	3040	44,540
34	PHX	1	0	1800	150	75	AERIAL	23,000	11.36	2025	34		23,000	3240	26,240
36	PHX	2	0	1900	250	80	AERIAL	39,000	17.49	2230	36		39,000	3568	42,568
38	TEMPE	3	0	1500	100	65	BUR	29,500	17.68	1665	38	8,000	37,500	2664	40,164
45	PHX	2	0	1800	200	75	AC	42,000	20.24	2075	45		42,000	3320	45,320
47	PHX	1	0	1400	50	50	AER	19,500	13.00	1500	47	8,000	27,500	2400	29,900
53	SCTSDL	32	1	1800	150	100	BUR	36,000	17.68	2050	53	8,000	44,000	3280	47,280
54	TEMPE	1	0	1600	240	80	BUR	34,000	17.68	1920	54		34,000	3072	37,072
56	PHX	1	0	1200	0	125	AER	19,000	14.49	1325	56		19,000	2120	21,120
59	PHX	1	0	1900	100	150	AER	31,000	14.49	2150	59		31,000	3440	34,440
64	TEMPE	1	0	1900	300	200	BUR	42,500	17.68	2400	64	8,000	50,500	3840	54,340
77	CHNDLR	11	0	2100	500	200	AER	40,500	14.49	2800	77		40,500	4480	44,980
84	TEMPE	17	0	1100	300	100	BUR	26,500	17.68	1500	84	8,000	34,500	2400	36,900
90	PHX	1	0	1100	50	75	A	25,000	20.41	1225	90		25,000	1960	26,960
93	PHX	1	0	1000	120	40	AER	17,000	14.49	1160	93		17,000	1856	18,856
102	PHX	4	6	2000	900	500	A/C/B	49,000	14.41	3400	102		49,000	5440	54,440
103	SUN CITY	4	5	1800	1100	500	BUR	56,000	16.47	3400	103	8,000	64,000	5440	69,440
	# SAMPLES =	19				STRUCT TOT =		629,000		MH TOT =		64,000	693,000	62,600	755,600
						STRUCT AVG=		33,105		AVG-=		3,368	36,474	3,295	39,768
	ADJUST FOR COMMON STRUCTURE AND COMMON MANHOLE USE				=	STRUCTURE COST= AVG * 60%		$19,863		MH COST= AVG * 25%		$842		MEDIAN	40,164
														STD DEV	12,001
														AVG	39,768
						TOTAL PATH COST AVG =				$24,000			SD % OF MEAN		30%

2,000 TO 4,000 FT FROM CLEC FIBER ROUTE

ID	CITY	DS-1	DS-3	DIST, FIBER TO PROP	DIST, PROP TO BLDG ENTR.	DIST, BLDG ENT TO EQP ROOM	PATH TYPE	STRUC. COST	STR $ PER FT	FEET, TDIST	ID	MH	PATH COST	CABLE COST	TOT OSP COST
61	MESA	1	0	2600	150	30	A/BU	51,000	18.28	2780	61	8,000	59,000	4448	63,448
62	PHX	13	0	3500	800	300	A/C/D	99,000	21.50	4600	62		99,000	7360	106,360
67	PHX	1	0	3000	100	60	AER	10,500	3.30	3180	67		10,500	5088	15,588
68	PHX	2	0	3200	50	75		89,600	26.95	3325	68		89,600	5320	94,920
69	MESA	1	0	2600	25	60	AER	47,000	18.28	2585	69		47,000	4136	51,136
73	PHX	4	0	2500	50	150	A/C	34,000	12.59	2700	73		34,000	4320	38,320
77	CHNDLR	11	0	2100	500	200	AER	51,000	18.28	2800	77		51,000	4480	55,480
78	PHX	1	0	3200	300	150	C	88,000	24.11	3650	78		88,000	5840	93,840
79	SCTSDL	1	0	2500	280	60	BUR	67,000	23.65	2830	79	8,000	75,000	4528	79,528
80	PHX	1	0	2900	500	250	A/C	73,000	20.00	3650	80		73,000	5840	78,840
97	PHX	1	0	3500	200	75	AER	42,500	11.26	3775	97		42,500	6040	48,540
16	TEMPE	2	0	3500	120	150	BUR	81,000	21.50	3770	16	8,000	89,000	6032	95,032
81	CHNDLR	1	0	3600	150	125	BUR	71,000	18.28	3875	81		71,000	6200	77,200
86	SCTSDL	2	0	3650	40	25	BUR	88,000	23.65	3715	86	8,000	96,000	5944	101,944
92	CHNDLR	1	0	4000	70	30	AER	75,000	18.28	4100	92		75,000	6560	81,560
	15					STRUCT TOT =		967,600		MH TOT =		32,000	999,600	82,136	1,081,736
						STRUCT AVG=		64,507		AVG-=		2,133	66,640	5,476	72,116
	ADJUST FOR COMMON STRUCTURE AND COMMON MANHOLE USE				=	STRUCTURE COST= AVG * 60%		$38,704		MH COST= AVG * 25%		$533		MEDIAN	78,84
														STD DEV	25,14
														AVG	72,11
						TOTAL PATH COST AVG =				$44,713			SD % OF MEAN		351

4,000 FT TO 9,000 FT FROM CLEC FIBER ROUTE

ID	CITY	DS-1	DS-3	DIST, FIBER TO PROP	DIST, PROP TO BLDG ENTR.	DIST, BLDG ENT TO EQP ROOM	PATH TYPE	STRUC. COST	STR $ PER FT	FEET, TDIST	ID	MH	PATH COST	CABLE COST	TOT OSP COST
82	PHX	2	0	4500	300	200	A	36,000	7.20	5000	82		36,000	6000	44,000
83	PHX	66	2	4600	900	200	AER	85,500	14.49	5900	83		85,500	9440	94,940
85	PEORIA	1	0	4800	350	150	AER	51,000	9.62	5300	85		51,000	8480	59,480
88	SCTSDL	0	0	5300	100	280	BUR	112,500	20	5680	88	8,000	120,500	9088	129,588
95	SCTSDL	2	0	5300	240	200	BUR	113,500	20	5740	95	8,000	121,500	9184	130,684
96	PHX	1	0	6000	700	200	A	85,000	10	6900	96		85,000	14240	99,240
98	PHX	1	0	7500	200	50	A	30,000	3.87	7750	98		30,000	12400	42,400
99	PHX	1	0	7500	30	250	AEU	175,000	22.49	7780	99		175,000	12448	187,448
101	PHX	4	6	4800	200	150	A/C	95,000	18.45	5150	101		95,000	8240	103,240
	# SAMPLES =	9				STRUCT TOT =		783,500		MH TOT =		16,000	799,500	91,520	891,020
						STRUCT AVG=		87,056		AVG-=		1,778	88,833	10,169	99,002
	ADJUST FOR COMMON STRUCTURE AND COMMON MANHOLE USE				=	STRUCTURE COST= AVG * 60%		$52,233		MH COST= AVG * 25%		$444		MEDIAN	99,240
														STD DEV	44,206
														AVG	99,002
						TOTAL PATH COST AVG =				$62,847			SD % OF MEAN		45%

PATH COSTS SUMMARY BY BAND, PER CUSTOMER LOCATION

BAND, DISTANCE FROM CAP FIBER ROUTE	COST FOR PATH (STRUCTURE, ACESS TO CAP FIBER, ACCESS TO BUILDING TO EQUIPMENT ROOM, AND CABLE)
0 TO 1,000 FT	$11,000
1,001 TO 2,000 FT	$24,000
2,001 TO 4,000 FT	$44,500
4,000 TO 9,000 FT	$63,000

APPENDIX
DATA AND DATA SOURCES

C. EQUIPMENT COSTS - FORMULAS FOR VARIOUS SERVICE SCENARIOS EXCEL ® SPREADSHEET "EQPT COST.XLS"

HI-CAP SERVICE EQUIPMENT COSTS INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

DS1 SERVICE
FOR 1 TO 3 DS1'S, USE

QUAD SYSTEM WITHOUT AUTOMATIC ROUTE PROTECTION $5,468
CAPACITY: 4 DS1'S PER SYSTEM
2 FIBERS PER QUAD SYSTEM

EXAMPLE, FOR N DS1'S	N=	1
QUADS	1	$5,468
EQPT COST PER DS1		$5,468
FIBERS USED	2	

EXAMPLE, FOR N DS1'S	N=	3
QUADS	1	$5,468
EQPT COST PER DS1		$1,823
FIBERS USED	2	

DS1 SERVICE
FOR 4 TO 12 DS1'S, USE

QUAD SYSTEM WITH AUTOMATIC ROUTE PROTECTION
CAPACITY: 4 DS1'S PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

QUAD SYSTEM	$5,468
HIGH SPEED INTERFACE CARD/SYSTEM	$2,000
INTERFACE SWITCH CARD/SYSTEM	$600

COST = (5468+2600)*ROUNDUP(N/4,0)

EXAMPLE, FOR N DS1'S	N=	5
QUADS	2	$16,136
EQPT COST PER DS1		$3,227
FIBERS USED	8	

EXAMPLE, FOR N DS1'S	N=	12
QUADS	3	$24,204
EQPT COST PER DS1		$2,017
FIBERS USED	12	

INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

FOR 13 TO 56 DS1'S, USE

DS3 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
CAPACITY: 28 DS1'S PER DS3 SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANSCEIVERS/SYSTEM	$3,972
CUST PRM COMMONS/SYSTEM	$13,400
HIGH SPEED INTERFACE CARD/SYSTEM	$2,200
HIGH SPEED INTERFACE SWITCH CARD/SYSTEM	$800
DS-1 CARD/FOUR DS-1'S, MAX=7/SYS	$705

TOTAL COST FOR N DS1'S =
ROUNDUP(N/28,0)*(3972+13400+2200+800)+ROUNDUP(N/4)*705

EXAMPLE, FOR N DS1'S	N=	13
HT'S (NO. OF SYSTEMS)	1	$3,972
CUST PREM COM	1	$13,400
H.S. INTERFACE CARDS	1	$2,200
H.S. INTERFACE SW. CARDS	1	$800
DS1 CARDS	4	$2,820
TOTAL FOR 24 DS1'S		$23,192
EQPT COST PER DS1		$1,784
FIBERS USED =	4	

EXAMPLE, FOR N DS1'S	N=	56
HT'S (NO. OF SYSTEMS)	2	$7,944
CUST PREM COM	2	$26,800
H.S. INTERFACE CARDS	2	$2,200
H.S. INTERFACE SW. CARDS	2	$800
DS1 CARDS	14	$9,870
TOTAL FOR 24 DS1'S		$50,614
EQPT COST PER DS1		$904
FIBERS USED	8	

INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

DS-1 SERVICE
FOR 57 OR MORE DS1'S USE

OC-3 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
CAPACITY - 84 DS1'S PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANSCEIVERS	$6,675
CUST PRM COMMONS	$31,745
HIGH SPEED INTERFACE CARDS, 1 PER SYSTEM	$2,400
H. S. INTERFACE SWITCH CARDS, 1 PER SYSTEM	$1,000
DS-1 CARD PER FOUR DS-1'S, MAX OF 7,21*4=84	$738

TOTAL COST FOR N DS1'S=
ROUNDUP(N/84,0)*(6675+31745+2400+1000)+ROUNDUP(N/4,0)*738

EXAMPLE, FOR N DS1'S	N=	57
HT'S (NO. OF SYSTEMS)	1	$6,675
CUST PREM COM	1	$31,745
H.S. INTERFACE CARDS	1	$2,400
H.S. INTERFACE SW. CARDS	1	$1,000
DS1 CARDS	15	$11,070
TOTAL FOR 24 DS1'S		$52,890
EQPT COST PER DS1		$928
NUMBER OF FIBERS	4	

EXAMPLE, FOR N DS1'S	N=	85
HT'S (NO. OF SYSTEMS)	2	$13,350
CUST PREM COM	2	$63,490
H.S. INTERFACE CARDS	2	$4,800
H.S. INTERFACE SW. CARDS	2	$2,000
DS1 CARDS	22	$16,236
TOTAL FOR 24 DS1'S		$99,876
EQPT COST PER DS1		$1,175
NUMBER OF FIBERS	8	

EXAMPLE, FOR N DS1'S	N=	168
HT'S (NO. OF SYSTEMS)	2	$13,350
CUST PREM COM	2	$63,490
H.S. INTERFACE CARDS	2	$4,800
H.S. INTERFACE SW. CARDS	2	$2,000
DS1 CARDS	42	$30,996
TOTAL FOR 24 DS1'S		$114,636
EQPT COST PER DS1		$682
NUMBER OF FIBERS	8	

HI-CAP SERVICE EQUIPMENT COSTS
INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

DS-3 SERVICE
FOR 1 TO 3 DS3'S USE

OC-3 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
CAPACITY: 3 DS3'S PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANSCEIVERS/SYSTEM	$6,675
CUSTOMER PREMISE COMMONS/SYSTEM	$31,745
HIGH SPEED INTERFACE CARDS, 1 PER SYSTEM	$2,400
H. S. INTERFACE SWITCH CARDS, 1 PER SYSTEM	$1,000
DS3 CARD/DS3	$2,700

TOTAL, N DS3'S =
ROUNDUP(N/3,0)*(6675+31745+2400+1000)+(N*2700)

EXAMPLE, FOR N DS-3'S	N=	1
HT'S (NO. OF SYSTEMS)	1	$6,675
CUST PREM COM	1	$31,745
H. S. INTERFACE CARDS	1	$2,400
H. S. INTERFACE SW. CARDS	1	$1,000
DS-3 CARDS	1	$2,700
TOTAL FOR N DS-3'S		$44,520
COST PER DS-3		$44,520
FIBERS USED	4	

EXAMPLE, FOR N DS-3'S	N=	3
HT'S (NO. OF SYSTEMS)	1	$6,675
CUST PREM COM	1	$31,745
H. S. INTERFACE CARDS	1	$2,400
H. S. INTERFACE SW. CARDS	1	$1,000
DS-3 CARDS	3	$8,100
TOTAL FOR N DS-3'S		$49,920
COST PER DS-3		$16,640
FIBERS USED	4	

HI-CAP SERVICE EQUIPMENT COSTS INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

FOR 4 TO 12 DS3'S, USE

OC-12 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
CAPACITY: 12 DS3'S PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANCEIVERS	1/SYSTEM	$7,875
CUST PREM COMMONS	1/SYSTEM	$40,737
HIGH SPEED INTERFACE CARDS, 1 PER SYSTEM		$2,500
H. S. INTERFACE SWITCH CARDS, 1 PER SYSTEM		$1,200
DS3 CARD-FOUR DS3 PER CARD		$7,100

TOTAL, N DS3'S =
'ROUNDUP(N/12,0)*(7875+40737+2500+1200)+ROUNDUP(N/4,0)*7100

FOR 4 TO 12 DS3'S, CONTINUED

EXAMPLE, FOR N DS3'S	N=	4
HT"S (NO. OF SYSTEMS)=	1	$7,875
CUST PREM COMMONS	1	$40,737
H. S. INTERFACE CARDS	1	$2,500
H. S. INTERFACE SW. CARDS	1	$1,200
DS3 CARDS	1	$7,100
TOTAL FOR N DS3'S =		$55,712
COST PER DS3 =		$13,928
NUMBER OF FIBERS	4	

EXAMPLE, FOR N DS3'S	N=	12
HT"S (NO. OF SYSTEMS)=	1	$7,875
CUST PREM COMMONS	1	$40,737
H. S. INTERFACE CARDS	1	$2,500
H. S. INTERFACE SW. CARDS	1	$1,200
DS3 CARDS	3	$21,300
TOTAL FOR N DS3'S =		$69,912
COST PER DS3 =		$5,826
NUMBER OF FIBERS	4	

HI-CAP SERVICE EQUIPMENT COSTS INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

DS-3 SERVICE

FOR 13 OR MORE DS3'S, USE

OC-48 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
CAPACITY: 48 DS3'S PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANCEIVERS	1/SYSTEM	$9,724
CUST PREM COMMONS	1/SYSTEM	$48,747
HIGH SPEED INTERFACE CARDS, 1 PER SYSTEM		$2,600
H. S. INTERFACE SWITCH CARDS, 1 PER SYSTEM		$1,400
DS3 CARD, FOUR DS3' PER CARD		$7,100

TOTAL, N DS3'S =
'ROUNDUP(N/48,0)*(9724+48747+2600+1400)+ROUNDUP(N/4,0)*7100

EXAMPLE, FOR N DS3'S	N=	13
HT"S (NO. OF SYSTEMS)=	1	$9,724
CUST PREM COMMONS	1	$48,747
H. S. INTERFACE CARDS	1	$2,600
H. S. INTERFACE SW. CARDS	1	$1,400
DS3 CARDS	4	$28,400
TOTAL FOR N DS3'S =		$90,871
COST PER DS3 =		$6,990
NUMBER OF FIBERS	4	

FOR 4 TO 13 OR MORE DS3'S, CONTINUED

EXAMPLE, FOR N DS3'S	N=	48
HT"S (NO. OF SYSTEMS)=	1	$9,724
CUST PREM COMMONS	1	$48,747
H. S. INTERFACE CARDS	1	$2,600
H. S. INTERFACE SW. CARDS	1	$1,400
DS3 CARDS	12	$85,200
TOTAL FOR N DS3'S =		$147,671
COST PER DS3 =		$3,076
NUMBER OF FIBERS	4	

HFCAP SERVICE EQUIPMENT COSTS
INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

OC-3 SERVICE

OC-3 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
ONE OC-3 CIRCUIT PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANSCEIVER	$6,675
CUST PREM COMS	$31,745
HIGH SPEED INTERFACE CARDS, 1 PER SYSTEM	$2,400
H. S. INTERFACE SWITCH CARDS, 1 PER SYSTEM	$1,000
TOTAL	$41,820

EXAMPLE, FOR N OC-3 CIRCUITS	N=	4
HUB TRANSCEIVERS	4	$26,700
CUST PREM COMS	4	$126,980
H. S. INTERFACE CARDS	4	$2,400
H. S. INTERFACE SW. CARDS	4	$1,000
TOTAL		$157,080
COST PER OC-3		$39,270
NUMBER OF FIBER	16	

OC-12 SERVICE

OC-12 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
ONE OC-12 CIRCUIT PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANSCEIVER	$7,875
CUST PREM COMS	$40,737
HIGH SPEED INTERFACE CARDS, 1 PER SYSTEM	$2,500
H. S. INTERFACE SWITCH CARDS, 1 PER SYSTEM	$1,200
TOTAL	$52,312

EXAMPLE, FOR N OC-12 CIRCUITS	N=	4
HUB TRANSCEIVERS	4	$31,500
CUST PREM COMS	4	$162,948
H. S. INTERFACE CARDS	4	$10,000
H. S. INTERFACE SW. CARDS	4	$4,800
TOTAL		$194,448
COST PER OC-12		$48,612
NUMBER OF FIBERS	16	

HI-CAP SERVICE EQUIPMENT COSTS
INCLUDING INSTALLATION

ONE CUSTOMER END PLUS INCREMENTAL CO/HUB COSTS

OC-48 SERVICE

OC-48 SYSTEM WITH AUTOMATIC ROUTE PROTECTION
ONE OC-48 CIRCUIT PER SYSTEM
4 FIBERS PER SYSTEM = 2 PRIMARY + 2 PROTECTION FIBERS

HUB TRANCEIVER	$9,274
CUST PREM COMMONS	$48,747
HIGH SPEED INTERFACE CARDS, 1 PER SYSTEM	$2,600
H. S. INTERFACE SWITCH CARDS, 1 PER SYSTEM	$1,400
TOTAL	$62,021

EXAMPLE, FOR N OC-48 CIRCUITS	N=	4
HUB TRANSCEIVERS	4	$37,096
CUST PREM COMS	4	$194,988
H. S. INTERFACE CARDS	4	$10,400
H. S. INTERFACE SW. CARDS	4	$5,600
TOTAL		$248,084
COST PER OC-3		$62,021
NUMBER OF FIBERS	16	

APPENDIX
DATA AND DATA SOURCES

D. TOTAL COSTS - FOR ALL LOCATIONS, BY BAND
EXCEL ® SPREADSHEET "TOTAL COST.XLS"

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
2	SCOTTSDALE	3	0	0	0	0	11,000	5,468	16,468
3	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
4	PHOENIX	7	3	0	0	0	11,000	66,056	77,056
5	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
6	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
7	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
8	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
9	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
10	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
11	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
12	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
13	PHOENIX	15	1	0	0	0	11,000	47,472	58,472
14	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
15	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
16	PHOENIX	14	0	0	0	0	11,000	23,192	34,192
17	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
18	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
19	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
20	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
21	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
22	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
23	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
24	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
25	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
26	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
27	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
28	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
29	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
30	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
31	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
32	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
33	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
34	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
35	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
36	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
37	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
38	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
39	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
40	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
41	PHOENIX	2	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
42	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
43	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
44	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
45	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
46	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
47	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
48	GLENDALE	2	0	0	0	0	11,000	5,468	16,468
49	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
50	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
51	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
52	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
53	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
54	SCOTSDAL	12	0	0	0	0	11,000	24,204	35,204
55	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
56	SCOTTSDA	1	0	0	0	0	11,000	5,468	16,468
57	PEORIA	1	0	0	0	0	11,000	5,468	16,468
58	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
59	GLENDALE	2	0	0	0	0	11,000	5,468	16,468
60	SCOTTSDALE	27	1	0	0	0	11,000	49,686	60,686
61	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
62	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
63	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
64	GLENDALE	3	0	0	0	0	11,000	5,468	16,468
65	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
66	SCOTTSDALE	3	0	0	0	0	11,000	5,468	16,468
67	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
68	SCOTTSDALE	3	0	0	0	0	11,000	5,468	16,468
69	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
70	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
71	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
72	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
73	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
74	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
75	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
76	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
77	GLENDALE	2	0	0	0	0	11,000	5,468	16,468
78	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
79	GLENDALE	2	0	0	0	0	11,000	5,468	16,468
80	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
81	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
82	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
83	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
84	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
85	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
86	PHOENIX	13	1	0	0	0	11,000	47,472	58,472
87	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
88	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
89	PEORIA	1	0	0	0	0	11,000	5,468	16,468
90	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
91	PEORIA	2	0	0	0	0	11,000	5,468	16,468
92	SCOTTSDALE	9	0	0	0	0	11,000	24,204	35,204
93	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
94	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
95	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
96	PHOENIX	26	2	0	0	0	11,000	52,386	63,386
97	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
98	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
99	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
100	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
101	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
102	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
103	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
104	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
105	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
106	PEORIA	1	0	0	0	0	11,000	5,468	16,468
107	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
108	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
109	PEORIA	3	0	0	0	0	11,000	5,468	16,468
110	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
111	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
112	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
113	PEORIA	2	0	0	0	0	11,000	5,468	16,468
114	PEORIA	1	0	0	0	0	11,000	5,468	16,468
115	PEORIA	1	0	0	0	0	11,000	5,468	16,468
116	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
117	PHOENIX	19	0	0	0	0	11,000	23,897	34,897
118	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
119	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
120	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
121	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
122	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
123	PHOENIX	3	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
124	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
125	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
126	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
127	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
128	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
129	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
130	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
131	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
132	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
133	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
134	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
135	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
136	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
137	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
138	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
139	GLENDALE	2	0	0	0	0	11,000	5,468	16,468
140	GLENDALE	5	0	0	0	0	11,000	16,136	27,136
141	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
142	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
143	GLENDALE	3	0	0	0	0	11,000	5,468	16,468
144	PEORIA	1	0	0	0	0	11,000	5,468	16,468
145	PEORIA	1	0	0	0	0	11,000	5,468	16,468
146	PEORIA	1	0	0	0	0	11,000	5,468	16,468
147	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
148	PHOENIX	16	10	0	0	0	11,000	76,564	87,564
149	PHOENIX	34	3	0	0	0	11,000	97,009	108,009
150	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
151	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
152	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
153	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
154	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
155	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
156	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
157	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
158	PHOENIX	21	0	0	0	0	11,000	24,602	35,602
159	PHOENIX	16	0	0	0	0	11,000	23,192	34,192
160	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
161	PEORIA	1	0	0	0	0	11,000	5,468	16,468
162	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
163	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
164	PHOENIX	3	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
165	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
166	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
167	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
168	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
169	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
170	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
171	PHOENIX	18	0	0	0	0	11,000	23,897	34,897
172	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
173	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
174	SCOTTSDALE	14	0	0	0	0	11,000	23,192	34,192
175	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068
176	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068
177	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
178	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
179	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068
180	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
181	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
182	PARADISE VALLEY	1	0	0	0	0	11,000	5,468	16,468
183	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
184	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
185	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
186	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
187	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
188	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
189	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
190	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
191	SCOTTSDALE	12	0	0	0	0	11,000	24,204	35,204
192	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
193	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
194	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
195	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
196	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
197	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
198	PARADISE VALLE	1	0	0	0	0	11,000	5,468	16,468
199	GLENDALE	3	0	0	0	0	11,000	5,468	16,468
200	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
201	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
202	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
203	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
204	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
205	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
206	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
207	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
208	GLENDALE	3	0	0	0	0	11,000	5,468	16,468
209	GLENDALE	4	0	0	0	0	11,000	8,068	19,068
210	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
211	SCOTTSDALE	12	0	0	0	0	11,000	24,204	35,204
212	GLENDALE	6	0	0	0	0	11,000	16,136	27,136
213	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
214	GLENDALE	5	0	0	0	0	11,000	16,136	27,136
215	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
216	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
217	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
218	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068
219	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
220	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
221	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
222	PHOENIX	14	0	0	0	0	11,000	23,192	34,192
223	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
224	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068
225	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
226	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
227	PARADISE VALLEY	3	0	0	0	0	11,000	5,468	16,468
228	PARADISE VALLEY	2	0	0	0	0	11,000	5,468	16,468
229	PARADISE VALLEY	6	0	0	0	0	11,000	16,136	27,136
230	PARADISE VALLEY	8	0	0	0	0	11,000	16,136	27,136
231	SCOTTSDALE	10	0	0	0	0	11,000	24,204	35,204
232	SCOTTSDALE	3	0	0	0	0	11,000	5,468	16,468
233	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
234	PARADISE VALLEY	1	0	0	0	0	11,000	5,468	16,468
235	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
236	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
237	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
238	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
239	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
240	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
241	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
242	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
243	PHOENIX	2	1	0	0	0	11,000	45,258	56,258
244	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
245	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
246	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
247	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
248	PARADISE VALLEY	2	0	0	0	0	11,000	5,468	16,468
249	GLENDALE	1	0	0	0	0	11,000	5,468	16,468
250	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
251	PARADISE VALLEY	1	0	0	0	0	11,000	5,468	16,468
252	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
253	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
254	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
255	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
256	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068
257	GLENDALE	2	0	0	0	0	11,000	5,468	16,468
258	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
259	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
260	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
261	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
262	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
263	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
264	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
265	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
266	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
267	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
268	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
269	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
270	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
271	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
272	PHOENIX	7	2	0	0	0	11,000	48,696	59,696
273	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
274	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
275	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
276	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
277	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
278	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
279	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
280	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
281	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
282	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
283	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
284	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
285	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
286	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
287	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
288	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
289	PHOENIX	2	3	0	0	0	11,000	55,388	66,388
290	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
291	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
292	PHOENIX	11	0	0	0	0	11,000	24,204	35,204
293	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
294	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
295	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
296	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
297	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
298	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
299	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
300	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
301	PHOENIX	25	0	0	0	0	11,000	25,307	36,307
302	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
303	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
304	PHOENIX	11	0	0	0	0	11,000	24,204	35,204
305	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
306	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
307	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
308	PHOENIX	23	0	0	0	0	11,000	24,602	35,602
309	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
310	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
311	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
312	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
313	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
314	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
315	PHOENIX	28	0	0	0	0	11,000	25,307	36,307
316	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
317	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
318	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
319	PHOENIX	17	0	0	0	0	11,000	23,897	34,897
320	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
321	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
322	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
323	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
324	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
325	PHOENIX	11	3	0	0	0	11,000	74,124	85,124
326	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
327	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
328	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
329	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
330	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
331	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
332	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
333	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
334	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
335	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
336	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
337	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
338	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
339	PHOENIX	2	1	0	0	0	11,000	45,258	56,258
340	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
341	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
342	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
343	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
344	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
345	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
346	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
347	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
348	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
349	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
350	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
351	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
352	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
353	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
354	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
355	PHOENIX	42	5	0	0	0	11,000	94,870	105,870
356	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
357	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
358	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
359	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
360	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
361	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
362	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
363	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
364	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
365	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
366	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
367	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
368	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
369	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
370	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
371	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
372	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
373	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
374	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
375	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
376	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
377	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
378	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
379	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
380	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
381	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
382	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
383	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
384	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
385	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
386	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
387	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
388	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
389	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
390	PHOENIX	165	5	0	0	0	11,000	181,148	192,148
391	PHOENIX	0	11	0	0	0	11,000	73,612	84,612
392	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
393	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
394	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
395	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
396	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
397	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
398	PHOENIX	808	65	0	0	0	11,000	812,918	823,918
399	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
400	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
401	PHOENIX	101	29	0	0	0	11,000	180,279	191,279
402	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
403	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
404	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
405	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
406	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
407	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
408	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
409	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
410	PHOENIX	2	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
411	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
412	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
413	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
414	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
415	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
416	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
417	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
418	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
419	PHOENIX	35	1	0	0	0	11,000	51,162	62,162
420	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
421	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
422	PHOENIX	418	25	0	0	0	11,000	398,761	409,761
423	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
424	PHOENIX	134	0	0	0	0	11,000	108,732	119,732
425	PHOENIX	48	29	0	0	0	11,000	148,334	159,334
426	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
427	PHOENIX	0	0	0	0	3	11,000	186,063	197,063
428	PHOENIX	13	2	0	0	0	11,000	50,172	61,172
429	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
430	PHOENIX	7	3	0	0	0	11,000	66,056	77,056
431	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
432	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
433	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
434	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
435	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
436	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
437	PHOENIX	18	0	0	0	0	11,000	23,897	34,897
438	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
439	PHOENIX	21	0	0	0	0	11,000	24,602	35,602
440	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
441	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
442	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
443	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
444	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
445	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
446	PHOENIX	23	0	0	0	0	11,000	24,602	35,602
447	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
448	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
449	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
450	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
451	PHOENIX	21	0	0	0	0	11,000	24,602	35,602

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
452	PHOENIX	23	4	0	0	0	11,000	63,840	74,840
453	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
454	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
455	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
456	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
457	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
458	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
459	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
460	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
461	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
462	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
463	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
464	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
465	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
466	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
467	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
468	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
469	PHOENIX	22	0	0	0	0	11,000	24,602	35,602
470	SCOTTSDALE	4	1	0	0	0	11,000	45,258	56,258
471	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
472	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
473	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
474	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
475	PHOENIX	23	0	0	0	0	11,000	24,602	35,602
476	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
477	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
478	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
479	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
480	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
481	PHOENIX	23	0	0	0	0	11,000	24,602	35,602
482	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
483	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
484	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
485	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
486	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
487	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
488	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
489	SCOTTSDALE	5	0	0	0	0	11,000	16,136	27,136
490	SCOTTSDALE	7	0	0	0	0	11,000	16,136	27,136
491	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
492	PHOENIX	4	0	0	0	0	11,000	8,068	19,068

Phoenix Fiber Study
Cost Model - Competitive Access Providers
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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
493	PHOENIX	500	0	0	0	0	11,000	343,170	354,170
494	PHOENIX	16	1	0	0	0	11,000	47,472	58,472
495	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
496	PHOENIX	0	0	0	0	1	11,000	62,021	73,021
497	PHOENIX	94	74	0	0	0	11,000	319,374	330,374
498	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
499	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
500	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
501	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
502	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
503	PHOENIX	262	18	0	0	0	11,000	313,959	324,959
504	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
505	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
506	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
507	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
508	PHOENIX	6	5	0	0	0	11,000	67,988	78,988
509	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
510	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
511	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
512	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
513	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
514	PHOENIX	11	0	0	0	0	11,000	24,204	35,204
515	PHOENIX	31	0	0	0	0	11,000	46,384	57,384
516	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
517	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
518	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
519	PHOENIX	9	1	0	0	0	11,000	46,734	57,734
520	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
521	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
522	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
523	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
524	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
525	PHOENIX	11	0	0	0	0	11,000	24,204	35,204
526	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
527	PHOENIX	14	0	0	0	0	11,000	23,192	34,192
528	SCOTTSDALE	3	0	0	0	0	11,000	5,468	16,468
529	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
530	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
531	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
532	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
533	PHOENIX	3	0	0	0	0	11,000	5,468	16,468

Phoenix Fiber Study
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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
534	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
535	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
536	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
537	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
538	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
539	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
540	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
541	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
542	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
543	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
544	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
545	PHOENIX	31	0	0	0	0	11,000	46,384	57,384
546	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
547	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
548	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
549	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
550	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
551	PHOENIX	37	0	0	0	0	11,000	47,794	58,794
552	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
553	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
554	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
555	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
556	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
557	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
558	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
559	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
560	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
561	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
562	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
563	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
564	PHOENIX	9	1	0	0	0	11,000	46,734	57,734
565	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
566	PHOENIX	8	1	0	0	0	11,000	45,996	56,996
567	PHOENIX	34	0	0	0	0	11,000	47,089	58,089
568	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
569	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
570	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
571	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
572	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
573	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
574	PHOENIX	3	0	0	0	0	11,000	5,468	16,468

Phoenix Fiber Study
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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
575	PHOENIX	14	1	0	0	0	11,000	47,472	58,472
576	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
577	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
578	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
579	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
580	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
581	SCOTTSDALE	4	0	0	0	0	11,000	8,068	19,068
582	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
583	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
584	PHOENIX	16	0	0	0	0	11,000	23,192	34,192
585	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
586	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
587	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
588	PHOENIX	26	0	0	0	0	11,000	25,307	36,307
589	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
590	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
591	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
592	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
593	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
594	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
595	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
596	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
597	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
598	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
599	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
600	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
601	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
602	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
603	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
604	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
605	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
606	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
607	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
608	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
609	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
610	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
611	PHNX	1	0	0	0	0	11,000	5,468	16,468
612	PHOENIX	151	7	0	0	0	11,000	178,196	189,196
613	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
614	PHOENIX	229	0	0	0	0	11,000	168,264	179,264
615	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
616	PHOENIX	57	17	0	0	0	11,000	149,521	160,521
617	PHOENIX	1	1	0	0	0	11,000	45,258	56,258
618	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
619	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
620	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
621	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
622	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
623	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
624	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
625	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
626	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
627	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
628	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
629	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
630	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
631	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
632	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
633	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
634	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
635	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
636	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
637	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
638	SCOTTSDALE	6	0	0	0	0	11,000	16,136	27,136
639	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
640	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
641	PHOENIX	11	0	0	0	0	11,000	24,204	35,204
642	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
643	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
644	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
645	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
646	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
647	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
648	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
649	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
650	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
651	PHOENIX	48	1	0	0	0	11,000	53,376	64,376
652	PHOENIX	0	0	1	0	0	11,000	41,820	52,820
653	PHOENIX	67	11	0	0	0	11,000	126,572	137,572
654	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
655	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
656	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
657	TEMPE	2	0	0	0	0	11,000	5,468	16,468
658	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
659	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
660	MESA	1	0	0	0	0	11,000	5,468	16,468
661	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
662	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
663	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
664	SCOTTSDALE	2	0	0	0	0	11,000	5,468	16,468
665	SCOTTSDALE	39	0	0	0	0	11,000	47,794	58,794
666	SCOTTSDALE	3	0	0	0	0	11,000	5,468	16,468
667	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
668	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
669	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
670	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
671	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
672	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
673	SCOTTSDALE	3	0	0	0	0	11,000	5,468	16,468
674	TOLLESON	2	0	0	0	0	11,000	5,468	16,468
675	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
676	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
677	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
678	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
679	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
680	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
681	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
682	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
683	MESA	2	0	0	0	0	11,000	5,468	16,468
684	MESA	14	0	0	0	0	11,000	23,192	34,192
685	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
686	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
687	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
688	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
689	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
690	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
691	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
692	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
693	AVONDALE	3	0	0	0	0	11,000	5,468	16,468
694	PHOENIX	36	0	0	0	0	11,000	47,089	58,089
695	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
696	PHOENIX	0	0	2	0	0	11,000	83,640	94,640
697	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
698	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
699	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
700	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
701	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
702	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
703	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
704	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
705	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
706	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
707	CHANDLER	4	0	0	0	0	11,000	8,068	19,068
708	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
709	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
710	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
711	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
712	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
713	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
714	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
715	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
716	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
717	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
718	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
719	SCOTTSDALE	1	0	0	0	0	11,000	5,468	16,468
720	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
721	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
722	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
723	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
724	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
725	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
726	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
727	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
728	SCOTTSDALE	5	0	0	0	0	11,000	16,136	27,136
729	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
730	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
731	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
732	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
733	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
734	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
735	PHOENIX	245	27	0	0	0	11,000	283,387	294,387
736	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
737	PHOENIX	8	4	0	0	0	11,000	60,888	71,888
738	PHOENIX	12	1	0	0	0	11,000	46,734	57,734

Phoenix Fiber Study
Cost Model - Competitive Access Providers
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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
739	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
740	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
741	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
742	PHNX	1	0	0	0	0	11,000	5,468	16,468
743	PHNX	6	0	0	0	0	11,000	16,136	27,136
744	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
745	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
746	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
747	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
748	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
749	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
750	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
751	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
752	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
753	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
754	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
755	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
756	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
757	PHNX	22	0	0	0	0	11,000	24,602	35,602
758	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
759	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
760	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
761	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
762	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
763	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
764	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
765	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
766	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
767	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
768	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
769	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
770	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
771	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
772	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
773	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
774	AVONDALE	1	0	0	0	0	11,000	5,468	16,468
775	PHOENIX	14	0	0	0	0	11,000	23,192	34,192
776	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
777	PHOENIX	7	2	0	0	0	11,000	48,696	59,696
778	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
779	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
780	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
781	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
782	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
783	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
784	PHOENIX	27	0	0	0	0	11,000	25,307	36,307
785	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
786	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
787	PHOENIX	20	1	0	0	0	11,000	48,210	59,210
788	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
789	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
790	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
791	PHOENIX	14	0	0	0	0	11,000	23,192	34,192
792	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
793	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
794	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
795	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
796	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
797	PHOENIX	0	0	0	14	0	11,000	732,368	743,368
798	PHOENIX	2621	0	0	0	0	11,000	1,822,368	1,833,368
799	PHOENIX	0	0	12	0	0	11,000	501,840	512,840
800	PHOENIX	332	0	0	0	0	11,000	228,534	239,534
801	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
802	ST PHOENIX AZ	7	4	0	0	0	11,000	60,888	71,888
803	PHOENIX	0	0	0	0	6	11,000	372,126	383,126
804	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
805	PHOENIX	2	1	0	0	0	11,000	45,258	56,258
806	PHOENIX	352	43	0	0	0	11,000	372,795	383,795
807	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
808	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
809	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
810	PHOENIX	10	2	0	0	0	11,000	49,434	60,434
811	PHOENIX	561	218	0	0	0	11,000	1,099,653	1,110,653
812	ST PHOENIX AZ	2	0	0	0	0	11,000	5,468	16,468
813	PHOENIX	26	0	0	0	0	11,000	25,307	36,307
814	PHOENIX	48	0	0	0	0	11,000	49,204	60,204
815	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
816	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
817	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
818	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
819	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
820	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
821	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
822	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
823	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
824	PHOENIX	9	0	0	0	0	11,000	24,204	35,204
825	PHOENIX	7	0	0	0	0	11,000	16,136	27,136
826	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
827	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
828	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
829	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
830	PHOENIX	13	1	0	0	0	11,000	47,472	58,472
831	PHOENIX	66	8	0	0	0	11,000	119,472	130,472
832	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
833	TOLLESON	2	0	0	0	0	11,000	5,468	16,468
834	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
835	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
836	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
837	PHOENIX	35	0	0	0	0	11,000	47,089	58,089
838	PHOENIX	14	0	0	0	0	11,000	23,192	34,192
839	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
840	PHOENIX	20	0	0	0	0	11,000	23,897	34,897
841	PHOENIX	12	1	0	0	0	11,000	46,734	57,734
842	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
843	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
844	TEMPE	0	1	0	0	0	11,000	44,520	55,520
845	TEMPE	1	0	0	0	0	11,000	5,468	16,468
846	TEMPE	45	1	0	0	0	11,000	53,376	64,376
847	TEMPE	1	0	0	0	0	11,000	5,468	16,468
848	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
849	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
850	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
851	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
852	TEMPE	27	0	0	0	0	11,000	25,307	36,307
853	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
854	PHOENIX	2	2	0	0	0	11,000	47,958	58,958
855	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
856	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
857	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
858		0	0	1	0	0	11,000	41,820	52,820
859	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
860	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
861	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
862	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
863	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
864	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
865	PHOENIX	51	4	0	0	0	11,000	69,006	80,006
866	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
867	PHOENIX	55	0	0	0	0	11,000	50,614	61,614
868	PHOENIX	5	1	0	0	0	11,000	45,996	56,996
869	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
870	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
871	PHOENIX	16	0	0	0	0	11,000	23,192	34,192
872	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
873	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
874	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
875	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
876	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
877	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
878	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
879	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
880	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
881	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
882	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
883	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
884	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
885	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
886	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
887	PHOENIX	29	2	0	0	0	11,000	73,463	84,463
888	PHOENIX	591	0	0	0	0	11,000	443,784	454,784
889	PHOENIX	197	42	0	0	0	11,000	302,931	313,931
890	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
891	PHNX	3	0	0	0	0	11,000	5,468	16,468
892	PHOENIX	98	1	0	0	0	11,000	103,351	114,351
893	PHNX	5	0	0	0	0	11,000	16,136	27,136
894	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
895	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
896	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
897	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
898	PHOENIX	42	4	0	0	0	11,000	67,530	78,530
899	PHOENIX	30	3	0	0	0	11,000	96,304	107,304
900	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
901	PHOENIX	0	0	0	0	1	11,000	62,021	73,021
902	PHOENIX	999	74	0	0	0	11,000	946,182	957,182

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
903	PHOENIX	21	0	0	0	0	11,000	24,602	35,602
904	PHOENIX	6	7	0	0	0	11,000	67,988	78,988
905	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
906	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
907	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
908	PHOENIX	0	3	0	0	0	11,000	49,920	60,920
909	PHOENIX	1	1	0	0	0	11,000	45,258	56,258
910	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
911	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
912	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
913	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
914	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
915	FLORENCE	2	0	0	0	0	11,000	5,468	16,468
916	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
917	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
918	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
919	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
920	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
921	PHOENIX	17	0	0	0	0	11,000	23,897	34,897
922	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
923	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
924	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
925	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
926	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
927	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
928	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
929	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
930	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
931	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
932	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
933	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
934	TEMPE	1	0	0	0	0	11,000	5,468	16,468
935	TEMPE	32	0	0	0	0	11,000	46,384	57,384
936	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
937	TEMPE	2	0	0	0	0	11,000	5,468	16,468
938	TEMPE	18	0	0	0	0	11,000	23,897	34,897
939	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
940	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
941	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
942	TEMPE	1	0	0	0	0	11,000	5,468	16,468
943	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
944	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
945	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
946	TEMPE	3	0	0	0	0	11,000	5,468	16,468
947	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
948	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
949	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
950	TEMPE	0	1	0	0	0	11,000	44,520	55,520
951	TEMPE	7	2	0	0	0	11,000	48,696	59,696
952	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
953	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
954	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
955	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
956	TEMPE	1	0	0	0	0	11,000	5,468	16,468
957	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
958	TEMPE	1	0	0	0	0	11,000	5,468	16,468
959	TEMPE	10	0	0	0	0	11,000	24,204	35,204
960	MESA	3	0	0	0	0	11,000	5,468	16,468
961	TEMPE	6	0	0	0	0	11,000	16,136	27,136
962	TEMPE	1	0	0	0	0	11,000	5,468	16,468
963	TEMPE	1	0	0	0	0	11,000	5,468	16,468
964	TEMPE	7	0	0	0	0	11,000	16,136	27,136
965	TEMPE	1	0	0	0	0	11,000	5,468	16,468
966	TEMPE	134	6	0	0	0	11,000	175,244	186,244
967	TEMPE	5	0	0	0	0	11,000	16,136	27,136
968	TEMPE	1	0	0	0	0	11,000	5,468	16,468
969	TEMPE	19	1	0	0	0	11,000	48,210	59,210
970	TEMPE	2	0	0	0	0	11,000	5,468	16,468
971	TEMPE	2	0	0	0	0	11,000	5,468	16,468
972	TEMPE	1	0	0	0	0	11,000	5,468	16,468
973	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
974	TEMPE	0	2	0	0	0	11,000	47,220	58,220
975	TEMPE	2	0	0	0	0	11,000	5,468	16,468
976	TEMPE	3	0	0	0	0	11,000	5,468	16,468
977	TEMPE	1	0	0	0	0	11,000	5,468	16,468
978	TEMPE	1	0	0	0	0	11,000	5,468	16,468
979	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
980	TEMPE	2	0	0	0	0	11,000	5,468	16,468
981	TEMPE	5	0	0	0	0	11,000	16,136	27,136
982	TEMPE	10	0	0	0	0	11,000	24,204	35,204
983	TEMPE	1	0	0	0	0	11,000	5,468	16,468
984	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
985	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
986	PHOENIX	21	0	0	0	0	11,000	24,602	35,602
987	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
988	TEMPE	1	0	0	0	0	11,000	5,468	16,468
989	MESA	1	0	0	0	0	11,000	5,468	16,468
990	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
991	TEMPE	2	0	0	0	0	11,000	5,468	16,468
992	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
993	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
994	MESA	1	0	0	0	0	11,000	5,468	16,468
995	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
996	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
997	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
998	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
999	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1000	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1001	MESA	4	0	0	0	0	11,000	8,068	19,068
1002	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1003	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1004	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1005	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1006	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1007	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
1008	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1009	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1010	MESA	1	0	0	0	0	11,000	5,468	16,468
1011	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1012	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1013	MESA	1	0	0	0	0	11,000	5,468	16,468
1014	TEMPE	43	2	0	0	0	11,000	75,578	86,578
1015	PHOENIX	10	0	0	0	0	11,000	24,204	35,204
1016	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1017	MESA	6	0	0	0	0	11,000	16,136	27,136
1018	MESA	14	4	0	0	0	11,000	62,364	73,364
1019	MESA	467	36	0	0	0	11,000	463,637	474,637
1020	MESA	0	0	0	3	0	11,000	156,936	167,936
1021	MESA	19	0	0	0	0	11,000	23,897	34,897
1022	MESA	1	0	0	0	0	11,000	5,468	16,468
1023	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1024	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1025	TEMPE	1	0	0	0	0	11,000	5,468	16,468

Phoenix Fiber Study
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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1026	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1027	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1028	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1029	TEMPE	4	1	0	0	0	11,000	45,258	56,258
1030	TEMPE	8	5	0	0	0	11,000	67,988	78,988
1031	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1032	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1033	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1034	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1035	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1036	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1037	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1038	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1039	CHANDLER	3	0	0	0	0	11,000	5,468	16,468
1040	CHANDLER	4	1	0	0	0	11,000	45,258	56,258
1041	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1042	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1043	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1044	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1045	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1046	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1047	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1048	GILBERT	1	0	0	0	0	11,000	5,468	16,468
1049	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1050	PHOENIX	0	1	0	0	0	11,000	44,520	55,520
1051	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1052	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1053	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1054	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1055	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1056	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1057	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1058	GILBERT	1	0	0	0	0	11,000	5,468	16,468
1059	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1060	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1061	TEMPE	5	0	0	0	0	11,000	16,136	27,136
1062	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1063	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1064	CHANDLER	2	0	0	0	0	11,000	5,468	16,468
1065	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1066	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1067	PHOENIX	21	0	0	0	0	11,000	24,602	35,602
1068	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1069	TEMPE	4	1	0	0	0	11,000	45,258	56,258
1070	PHOENIX	13	0	0	0	0	11,000	23,192	34,192
1071	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1072	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1073	MESA	15	3	0	0	0	11,000	73,112	84,112
1074	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1075	MESA	1	0	0	0	0	11,000	5,468	16,468
1076	MESA	3	0	0	0	0	11,000	5,468	16,468
1077	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1078	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1079	MESA	2	0	0	0	0	11,000	5,468	16,468
1080	MESA	1	0	0	0	0	11,000	5,468	16,468
1081	MESA	4	0	0	0	0	11,000	8,068	19,068
1082	MESA	1	0	0	0	0	11,000	5,468	16,468
1083	MESA	1	0	0	0	0	11,000	5,468	16,468
1084	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1085	MESA	1	0	0	0	0	11,000	5,468	16,468
1086	MESA	1	0	0	0	0	11,000	5,468	16,468
1087	MESA	1	0	0	0	0	11,000	5,468	16,468
1088	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1089	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1090	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1091	PHOENIX	18	0	0	0	0	11,000	23,897	34,897
1092	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1093	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1094	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1095	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1096	PHOENIX	42	1	0	0	0	11,000	52,638	63,638
1097	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1098	TEMPE	13	2	0	0	0	11,000	50,172	61,172
1099	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1100	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1101	TEMPE	32	0	0	0	0	11,000	46,384	57,384
1102	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1103	TEMPE	5	0	0	0	0	11,000	16,136	27,136
1104	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1105	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1106	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1107	MESA	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1108	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1109	GILBERT	20	1	0	0	0	11,000	48,210	59,210
1110	MESA	1	0	0	0	0	11,000	5,468	16,468
1111	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1112	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1113	TEMPE	14	0	0	0	0	11,000	23,192	34,192
1114	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1115	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1116	MESA	1	0	0	0	0	11,000	5,468	16,468
1117	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1118	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1119	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1120	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1121	MESA	2	0	0	0	0	11,000	5,468	16,468
1122	MESA	1	0	0	0	0	11,000	5,468	16,468
1123	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1124	GILBERT	1	0	0	0	0	11,000	5,468	16,468
1125	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1126	MESA	1	0	0	0	0	11,000	5,468	16,468
1127	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1128	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1129	MESA	3	0	0	0	0	11,000	5,468	16,468
1130	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1131	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1132	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1133	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1134	TEMPE	8	0	0	0	0	11,000	16,136	27,136
1135	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1136	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1137	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1138	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1139	PHOENIX	36	1	0	0	0	11,000	51,162	62,162
1140	TEMPE	11	0	0	0	0	11,000	24,204	35,204
1141	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1142	PHOENIX	18	0	0	0	0	11,000	23,897	34,897
1143	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1144	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1145	PHOENIX	1	2	0	0	0	11,000	47,958	58,958
1146	MESA	1	0	0	0	0	11,000	5,468	16,468
1147	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1148	CHANDLER	2	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1149	MESA	1	0	0	0	0	11,000	5,468	16,468
1150	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1151	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1152	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1153	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1154	MESA	1	0	0	0	0	11,000	5,468	16,468
1155	MESA	1	0	0	0	0	11,000	5,468	16,468
1156	MESA	1	0	0	0	0	11,000	5,468	16,468
1157	MESA	1	0	0	0	0	11,000	5,468	16,468
1158	MESA	1	0	0	0	0	11,000	5,468	16,468
1159	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1160	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1161	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1162	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1163	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1164	TEMPE	7	0	0	0	0	11,000	16,136	27,136
1165	MESA	1	0	0	0	0	11,000	5,468	16,468
1166	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1167	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1168	MESA	1	0	0	0	0	11,000	5,468	16,468
1169	MESA	1	0	0	0	0	11,000	5,468	16,468
1170	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1171	TEMPE	5	0	0	0	0	11,000	16,136	27,136
1172	TEMPE	7	0	0	0	0	11,000	16,136	27,136
1173	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1174	MESA	1	0	0	0	0	11,000	5,468	16,468
1175	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1176	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1177	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1178	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1179	MESA	1	0	0	0	0	11,000	5,468	16,468
1180	TEMPE	7	0	0	0	0	11,000	16,136	27,136
1181	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1182	MESA	1	0	0	0	0	11,000	5,468	16,468
1183	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1184	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1185	TEMPE	18	0	0	0	0	11,000	23,897	34,897
1186	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1187	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1188	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1189	TEMPE	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1190	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1191	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1192	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1193	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1194	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1195	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1196	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1197	MESA	1	0	0	0	0	11,000	5,468	16,468
1198	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1199	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1200	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1201	TEMPE	9	0	0	0	0	11,000	24,204	35,204
1202	CHANDLER	4	0	0	0	0	11,000	8,068	19,068
1203	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1204	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1205	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1206	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1207	PHOENIX	8	0	0	0	0	11,000	16,136	27,136
1208	PHOENIX	24	0	0	0	0	11,000	24,602	35,602
1209	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1210	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1211	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1212	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1213	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1214	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1215	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1216	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1217	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1218	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1219	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1220	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1221	TEMPE	49	2	0	0	0	11,000	76,988	87,988
1222	TEMPE	8	1	0	0	0	11,000	45,996	56,996
1223	TEMPE	57	5	0	0	0	11,000	118,062	129,062
1224	TEMPE	16	0	0	0	0	11,000	23,192	34,192
1225	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1226	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1227	TEMPE	11	0	0	0	0	11,000	24,204	35,204
1228	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1229	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1230	TEMPE	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1231	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1232	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1233	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1234	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1235	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1236	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1237	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1238	CHANDLER	21	0	0	0	0	11,000	24,602	35,602
1239	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1240	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1241	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1242	MESA	1	0	0	0	0	11,000	5,468	16,468
1243	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1244	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1245	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1246	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1247	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1248	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1249	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1250	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1251	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1252	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1253	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1254	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1255	TEMPE	7	0	0	0	0	11,000	16,136	27,136
1256	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1257	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1258	TEMPE	27	0	0	0	0	11,000	25,307	36,307
1259	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1260	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1261	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1262	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1263	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1264	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1265	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1266	TEMPE	12	0	0	0	0	11,000	24,204	35,204
1267	TEMPE	24	1	0	0	0	11,000	48,948	59,948
1268	TEMPE	8	0	0	0	0	11,000	16,136	27,136
1269	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1270	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1271	TEMPE	1	0	0	0	0	11,000	5,468	16,468

Phoenix Fiber Study
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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1272	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1273	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1274	TEMPE	8	0	0	0	0	11,000	16,136	27,136
1275	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1276	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1277	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1278	TEMPE	8	0	0	0	0	11,000	16,136	27,136
1279	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1280	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1281	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1282	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1283	PHOENIX	0	0	0	1	0	11,000	52,312	63,312
1284	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1285	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1286	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1287	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1288	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1289	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1290	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1291	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1292	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1293	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1294	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1295	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1296	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1297	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1298	TEMPE	6	0	0	0	0	11,000	16,136	27,136
1299	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1300	MESA	1	0	0	0	0	11,000	5,468	16,468
1301	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1302	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1303	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1304	TEMPE	24	0	0	0	0	11,000	24,602	35,602
1305	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1306	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1307	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1308	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1309	TEMPE	17	0	0	0	0	11,000	23,897	34,897
1310	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1311	TEMPE	6	0	0	0	0	11,000	16,136	27,136
1312	MESA	2	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1313	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1314	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1315	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1316	TEMPE	5	0	0	0	0	11,000	16,136	27,136
1317	MESA	33	0	0	0	0	11,000	47,089	58,089
1318	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1319	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1320	PHOENIX	11	0	0	0	0	11,000	24,204	35,204
1321	MESA	7	0	0	0	0	11,000	16,136	27,136
1322	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1323	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1324	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1325	PHOENIX	7	1	0	0	0	11,000	45,996	56,996
1326	MESA	1	0	0	0	0	11,000	5,468	16,468
1327	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1328	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1329	MESA	2	0	0	0	0	11,000	5,468	16,468
1330	MESA	1	0	0	0	0	11,000	5,468	16,468
1331	MESA	1	0	0	0	0	11,000	5,468	16,468
1332	MESA	1	0	0	0	0	11,000	5,468	16,468
1333	MESA	5	0	0	0	0	11,000	16,136	27,136
1334	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1335	MESA	1	0	0	0	0	11,000	5,468	16,468
1336	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1337	MESA	1	0	0	0	0	11,000	5,468	16,468
1338	MESA	1	0	0	0	0	11,000	5,468	16,468
1339	MESA	1	0	0	0	0	11,000	5,468	16,468
1340	MESA	1	0	0	0	0	11,000	5,468	16,468
1341	MESA	1	0	0	0	0	11,000	5,468	16,468
1342	MESA	1	0	0	0	0	11,000	5,468	16,468
1343	APACHE JUNCTION	5	0	0	0	0	11,000	16,136	27,136
1344	MESA	3	0	0	0	0	11,000	5,468	16,468
1345	APACHE JUNCTION	1	0	0	0	0	11,000	5,468	16,468
1346	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1347	MESA	1	0	0	0	0	11,000	5,468	16,468
1348	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1349	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1350	CHANDLER	12	0	0	0	0	11,000	24,204	35,204
1351	MESA	3	0	0	0	0	11,000	5,468	16,468
1352	MESA	4	0	0	0	0	11,000	8,068	19,068
1353	PHOENIX	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1354	TEMPE	7	0	0	0	0	11,000	16,136	27,136
1355	MESA	2	0	0	0	0	11,000	5,468	16,468
1356	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1357	TEMPE	8	0	0	0	0	11,000	16,136	27,136
1358	MESA	3	0	0	0	0	11,000	5,468	16,468
1359	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1360	MESA	4	0	0	0	0	11,000	8,068	19,068
1361	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1362	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1363	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1364	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1365	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1366	TEMPE	4	0	0	0	0	11,000	8,068	19,068
1367	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1368	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1369	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1370	MESA	1	0	0	0	0	11,000	5,468	16,468
1371	MESA	2	0	0	0	0	11,000	5,468	16,468
1372	MESA	1	0	0	0	0	11,000	5,468	16,468
1373	MESA	1	0	0	0	0	11,000	5,468	16,468
1374	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1375	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1376	MESA	2	0	0	0	0	11,000	5,468	16,468
1377	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1378	MESA	3	0	0	0	0	11,000	5,468	16,468
1379	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1380	MESA	1	0	0	0	0	11,000	5,468	16,468
1381	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1382	TEMPE	10	0	0	0	0	11,000	24,204	35,204
1383	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1384	TEMPE	9	0	0	0	0	11,000	24,204	35,204
1385	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1386	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1387	GILBERT	5	0	0	0	0	11,000	16,136	27,136
1388	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1389	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1390	MESA	4	0	0	0	0	11,000	8,068	19,068
1391	MESA	1	0	0	0	0	11,000	5,468	16,468
1392	MESA	1	0	0	0	0	11,000	5,468	16,468
1393	MESA	8	0	0	0	0	11,000	16,136	27,136
1394	TEMPE	2	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1395	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1396	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1397	GILBERT	1	0	0	0	0	11,000	5,468	16,468
1398	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1399	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1400	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1401	GILBERT	3	0	0	0	0	11,000	5,468	16,468
1402	GILBERT	2	0	0	0	0	11,000	5,468	16,468
1403	GILBERT	1	0	0	0	0	11,000	5,468	16,468
1404	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1405	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1406	PHOENIX	11	0	0	0	0	11,000	24,204	35,204
1407	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1408	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1409	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1410	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1411	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1412	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1413	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1414	TEMPE	18	3	0	0	0	11,000	73,817	84,817
1415	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1416	GILBERT	1	0	0	0	0	11,000	5,468	16,468
1417	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1418	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1419	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1420	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1421	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1422	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1423	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1424	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1425	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1426	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1427	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1428	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1429	PHOENIX	6	0	0	0	0	11,000	16,136	27,136
1430	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1431	PHOENIX	5	0	0	0	0	11,000	16,136	27,136
1432	PHOENIX	3	0	0	0	0	11,000	5,468	16,468
1433	GILBERT	5	0	0	0	0	11,000	16,136	27,136
1434	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1435	PHOENIX	15	1	0	0	0	11,000	47,472	58,472

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1436	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1437	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1438	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1439	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1440	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1441	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1442	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1443	GILBERT	4	0	0	0	0	11,000	8,068	19,068
1444	GILBERT	2	0	0	0	0	11,000	5,468	16,468
1445	CHANDLER	2	0	0	0	0	11,000	5,468	16,468
1446	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1447	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1448	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1449	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1450	TEMPE	3	0	0	0	0	11,000	5,468	16,468
1451	TEMPE	14	0	0	0	0	11,000	23,192	34,192
1452	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1453	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1454	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1455	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1456	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1457	TEMPE	5	0	0	0	0	11,000	16,136	27,136
1458	PHOENIX	4	0	0	0	0	11,000	8,068	19,068
1459	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1460	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1461	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1462	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1463	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1464	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1465	TEMPE	2	0	0	0	0	11,000	5,468	16,468
1466	TEMPE	1	0	0	0	0	11,000	5,468	16,468
1467	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1468	CHANDLER	3	0	0	0	0	11,000	5,468	16,468
1469	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1470	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1471	CHANDLER	4	0	0	0	0	11,000	8,068	19,068
1472	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1473	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1474	CHANDLER	2	0	0	0	0	11,000	5,468	16,468
1475	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1476	CHANDLER	1	0	0	0	0	11,000	5,468	16,468

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DISTANCE BAND 1: 0 TO 1,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1477	CHANDLER	2	0	0	0	0	11,000	5,468	16,468
1478	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1479	CHANDLER	2	0	0	0	0	11,000	5,468	16,468
1480	CHANDLER	3	0	0	0	0	11,000	5,468	16,468
1481	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1482	CHANDLER	2	0	0	0	0	11,000	5,468	16,468
1483	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1484	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1485	CHANDLER	4	2	0	0	0	11,000	47,958	58,958
1486		0	0	1	0	0	11,000	41,820	52,820
1487		0	0	0	1	0	11,000	52,312	63,312
1488	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1489	CHANDLER	0	1	0	0	0	11,000	44,520	55,520
1490	CHANDLER	8	0	0	0	0	11,000	16,136	27,136
1491	CHANDLER	22	2	0	0	0	11,000	51,648	62,648
1492	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1493	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1494	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1495	CHANDLER	3	0	0	0	0	11,000	5,468	16,468
1496	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1497	PHOENIX	2	0	0	0	0	11,000	5,468	16,468
1498	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1499	PHOENIX	1	0	0	0	0	11,000	5,468	16,468
1500	CHANDLER	3	0	0	0	0	11,000	5,468	16,468
1501	CHANDLER	9	0	0	0	0	11,000	24,204	35,204
1502	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1503	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1504	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1505	CHANDLER	2	0	0	0	0	11,000	5,468	16,468
1506	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1507	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
1508	CHANDLER	1	0	0	0	0	11,000	5,468	16,468
				Sub-Totals			$16,588,000	$28,043,239	

# in this Study	3101	Sum of Total Cost	$44,631,239
# in this Band	1508	Average of Total Cost	$29,596
		% of Addresses in this Band	48.63%

Phoenix Fiber Study
Cost Model - Competitive Access Providers
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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
2	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
3	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
4	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
5	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
6	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
7	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
8	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
9	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
10	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
11	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
12	PHOENIX	13	0	0	0	0	24,000	23,192	47,192
13	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
14	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
15	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
16	PHOENIX	1	1	0	0	0	24,000	45,258	69,258
17	PHOENIX	8	0	0	0	0	24,000	16,136	40,136
18	PHOENIX	10	0	0	0	0	24,000	24,204	48,204
19	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
20	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
21	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
22	PHOENIX	6	0	0	0	0	24,000	16,136	40,136
23	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
24	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
25	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
26	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
27	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
28	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
29	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
30	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
31	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
32	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
33	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
34	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
35	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
36	PHOENIX	6	0	0	0	0	24,000	16,136	40,136
37	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
38	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
39	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
40	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
41	GLENDALE	1	0	0	0	0	24,000	5,468	29,468

Phoenix Fiber Study
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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
42	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
43	SCOTTSDALE	5	0	0	0	0	24,000	16,136	40,136
44	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
45	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
46	SCOTTSDALE	5	0	0	0	0	24,000	16,136	40,136
47	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
48	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
49	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
50	PEORIA	2	0	0	0	0	24,000	5,468	29,468
51	PEORIA	2	0	0	0	0	24,000	5,468	29,468
52	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
53	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
54	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
55	PEORIA	2	0	0	0	0	24,000	5,468	29,468
56	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
57	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
58	PEORIA	1	0	0	0	0	24,000	5,468	29,468
59	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
60	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
61	PEORIA	0	2	0	0	0	24,000	47,220	71,220
62	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
63	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
64	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
65	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
66	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
67	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
68	PHOENIX	11	0	0	0	0	24,000	24,204	48,204
69	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
70	PHOENIX	5	0	0	0	0	24,000	16,136	40,136
71	PHOENIX	5	0	0	0	0	24,000	16,136	40,136
72	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
73	PEORIA	2	0	0	0	0	24,000	5,468	29,468
74	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
75	PEORIA	1	0	0	0	0	24,000	5,468	29,468
76	SCOTTSDALE	6	0	0	0	0	24,000	16,136	40,136
77	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
78	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
79	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
80	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
81	PEORIA	1	0	0	0	0	24,000	5,468	29,468
82	PHOENIX	2	0	0	0	0	24,000	5,468	29,468

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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
83	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
84	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
85	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
86	PHOENIX	10	0	0	0	0	24,000	24,204	48,204
87	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
88	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
89	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
90	SCOTTSDALE	16	0	0	0	0	24,000	23,192	47,192
91	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
92	PHOENIX	6	0	0	0	0	24,000	16,136	40,136
93	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
94	PEORIA	1	0	0	0	0	24,000	5,468	29,468
95	PEORIA	1	0	0	0	0	24,000	5,468	29,468
96	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
97	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
98	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
99	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
100	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
101	PHOENIX	5	5	0	0	0	24,000	67,988	91,988
102	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
103	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
104	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
105	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
106	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
107	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
108	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
109	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
110	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
111	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
112	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
113	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
114	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
115	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
116	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
117	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
118	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
119	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
120	SCOTTSDALE	0	1	0	0	0	24,000	44,520	68,520
121	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
122	SCOTTSDALE	3	1	0	0	0	24,000	45,258	69,258
123	SCOTTSDALE	0	1	0	0	0	24,000	44,520	68,520

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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
124	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
125	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
126	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
127	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
128	PHOENIX	23	3	0	0	0	24,000	74,522	98,522
129	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
130	PHOENIX	7	0	0	0	0	24,000	16,136	40,136
131	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
132	PHOENIX	19	0	0	0	0	24,000	23,897	47,897
133	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
134	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
135	PHOENIX	6	0	0	0	0	24,000	16,136	40,136
136	PARADISE VALLEY	8	0	0	0	0	24,000	16,136	40,136
137	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
138	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
139	SCOTTSDA	1	0	0	0	0	24,000	5,468	29,468
140	SCOTTSDALE	16	0	0	0	0	24,000	23,192	47,192
141	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
142	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
143	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
144	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
145	PHOENIX	20	2	0	0	0	24,000	50,910	74,910
146	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
147	PHOENIX	9	0	0	0	0	24,000	24,204	48,204
148	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
149	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
150	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
151	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
152	SCOTTSDALE	4	0	0	0	0	24,000	8,068	32,068
153	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
154	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
155	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
156	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
157	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
158	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
159	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
160	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
161	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
162	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
163	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
164	GLENDALE	1	0	0	0	0	24,000	5,468	29,468

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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
165	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
166	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
167	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
168	GLENDALE	4	0	0	0	0	24,000	8,068	32,068
169	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
170	PARADISE VALLEY	1	0	0	0	0	24,000	5,468	29,468
171	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
172	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
173	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
174	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
175	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
176	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
177	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
178	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
179	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
180	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
181	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
182	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
183	PHOENIX	9	0	0	0	0	24,000	24,204	48,204
184	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
185	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
186	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
187	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
188	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
189	PHOENIZ	1	0	0	0	0	24,000	5,468	29,468
190	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
191	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
192	PHOENIX	7	0	0	0	0	24,000	16,136	40,136
193	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
194	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
195	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
196	GLENDALE	1	0	0	0	0	24,000	5,468	29,468
197	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
198	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
199	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
200	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
201	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
202	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
203	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
204	PHOENIX	10	0	0	0	0	24,000	24,204	48,204
205	PHOENIX	4	0	0	0	0	24,000	8,068	32,068

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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
206	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
207	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
208	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
209	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
210	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
211	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
212	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
213	PHOENIX	9	0	0	0	0	24,000	24,204	48,204
214	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
215	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
216	SCOTTSDALE	19	1	0	0	0	24,000	48,210	72,210
217	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
218	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
219	SCOTTSDALE	5	0	0	0	0	24,000	16,136	40,136
220	SCOTTSDALE	4	0	0	0	0	24,000	8,068	32,068
221	PHOENIX	7	0	0	0	0	24,000	16,136	40,136
222	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
223	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
224	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
225	SCOTTSDAL	1	0	0	0	0	24,000	5,468	29,468
226	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
227	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
228	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
229	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
230	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
231	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
232	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
233	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
234	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
235	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
236	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
237	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
238	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
239	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
240	PHOENIX	5	0	0	0	0	24,000	16,136	40,136
241	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
242	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
243	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
244	PHOENIX	1	1	0	0	0	24,000	45,258	69,258
245	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
246	PHOENIX	2	0	0	0	0	24,000	5,468	29,468

Phoenix Fiber Study
Cost Model - Competitive Access Providers
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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
247	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
248	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
249	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
250	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
251	PHOENIX	12	0	0	0	0	24,000	24,204	48,204
252	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
253	PHOENIX	12	0	0	0	0	24,000	24,204	48,204
254	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
255	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
256	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
257	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
258	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
259	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
260	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
261	SCOTTSDALE	11	0	0	0	0	24,000	24,204	48,204
262	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
263	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
264	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
265	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
266	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
267	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
268	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
269	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
270	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
271	PHOENIX	5	0	0	0	0	24,000	16,136	40,136
272	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
273	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
274	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
275	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
276	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
277	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
278	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
279	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
280	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
281	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
282	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
283	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
284	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
285	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
286	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
287	PHOENIX	2	0	0	0	0	24,000	5,468	29,468

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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
288	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
289	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
290	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
291	MESA	1	0	0	0	0	24,000	5,468	29,468
292	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
293	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
294	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
295	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
296	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
297	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
298	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
299	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
300	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
301	PHOENIX	8	0	0	0	0	24,000	16,136	40,136
302	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
303	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
304	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
305	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
306	SCOTTSDALE	8	0	0	0	0	24,000	16,136	40,136
307	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
308	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
309	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
310	MESA	2	0	0	0	0	24,000	5,468	29,468
311	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
312	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
313	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
314	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
315	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
316	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
317	SCOTTSDALE	3	0	0	0	0	24,000	5,468	29,468
318	TOLLESON	1	0	0	0	0	24,000	5,468	29,468
319	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
320	CHANDLER	2	0	0	0	0	24,000	5,468	29,468
321	SCOTTSDALE	2	0	0	0	0	24,000	5,468	29,468
322	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
323	TOLLESON	6	0	0	0	0	24,000	16,136	40,136
324	TOLLESON	27	1	0	0	0	24,000	49,686	73,686
325	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
326	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
327	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
328	PHOENIX	1	0	0	0	0	24,000	5,468	29,468

DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
329	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
330	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
331	PHOENIX	2	0	0	0	0.	24,000	5,468	29,468
332	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
333	MESA	2	0	0	0	0	24,000	5,468	29,468
334	MESA	1	0	0	0	0	24,000	5,468	29,468
335	MESA	5	0	0	0	0	24,000	16,136	40,136
336	SCOTTSDALE	1	0	0	0	0	24,000	5,468	29,468
337	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
338	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
339	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
340	TOLLESON	2	0	0	0	0	24,000	5,468	29,468
341	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
342	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
343	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
344	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
345	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
346		0	0	1	0	0	24,000	41,820	65,820
347	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
348	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
349	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
350	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
351	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
352	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
353	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
354	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
355	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
356	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
357	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
358	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
359	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
360	PHOENIX	10	0	0	0	0	24,000	24,204	48,204
361	PHOENIX	12	0	0	0	0	24,000	24,204	48,204
362	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
363	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
364	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
365	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
366	PHOENIX	5	0	0	0	0	24,000	16,136	40,136
367	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
368	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
369	PHOENIX	1	0	0	0	0	24,000	5,468	29,468

DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
370	PHOENIX	14	0	0	0	0	24,000	23,192	47,192
371	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
372	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
373	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
374	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
375	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
376	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
377	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
378	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
379	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
380	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
381	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
382	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
383	TEMPE	1	0	0	0	0	24,000	5,468	29,468
384	PHOENIX	0	0	0	2	0	24,000	104,624	128,624
385	PHOENIX	50	2	0	0	0	24,000	76,988	100,988
386	AVONDALE	1	0	0	0	0	24,000	5,468	29,468
387	AVONDALE	1	0	0	0	0	24,000	5,468	29,468
388	PHOENIX	4	0	0	0	0	24,000	8,068	32,068
389	TEMPE	1	0	0	0	0	24,000	5,468	29,468
390	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
391	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
392	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
393	TEMPE	2	0	0	0	0	24,000	5,468	29,468
394	TEMPE	1	0	0	0	0	24,000	5,468	29,468
395	TEMPE	2	0	0	0	0	24,000	5,468	29,468
396	TEMPE	1	0	0	0	0	24,000	5,468	29,468
397	TEMPE	3	0	0	0	0	24,000	5,468	29,468
398	TEMPE	1	0	0	0	0	24,000	5,468	29,468
399	TEMPE	2	0	0	0	0	24,000	5,468	29,468
400	CHANDLER	6	0	0	0	0	24,000	16,136	40,136
401	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
402	PHOENIX	19	1	0	0	0	24,000	48,210	72,210
403	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
404	TEMPE	1	0	0	0	0	24,000	5,468	29,468
405	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
406	TEMPE	1	0	0	0	0	24,000	5,468	29,468
407	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
408	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
409	CHANDLER	3	0	0	0	0	24,000	5,468	29,468
410	CHANDLER	2	0	0	0	0	24,000	5,468	29,468

DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
411	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
412	PHOENIX	7	0	0	0	0	24,000	16,136	40,136
413	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
414	TEMPE	1	0	0	0	0	24,000	5,468	29,468
415	TEMPE	1	0	0	0	0	24,000	5,468	29,468
416	GILBERT	1	0	0	0	0	24,000	5,468	29,468
417	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
418	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
419	TEMPE	2	0	0	0	0	24,000	5,468	29,468
420	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
421	TEMPE	1	0	0	0	0	24,000	5,468	29,468
422	PHOENIX	5	0	0	0	0	24,000	16,136	40,136
423	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
424	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
425	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
426	TEMPE	13	0	0	0	0	24,000	23,192	47,192
427	TEMPE	35	0	0	0	0	24,000	47,089	71,089
428	MESA	1	0	0	0	0	24,000	5,468	29,468
429	TEMPE	6	0	0	0	0	24,000	16,136	40,136
430	TEMPE	35	0	0	0	0	24,000	47,089	71,089
431	TEMPE	1	0	0	0	0	24,000	5,468	29,468
432	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
433	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
434	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
435	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
436	MESA	3	0	0	0	0	24,000	5,468	29,468
437	MESA	1	0	0	0	0	24,000	5,468	29,468
438	MESA	1	0	0	0	0	24,000	5,468	29,468
439	TEMPE	2	0	0	0	0	24,000	5,468	29,468
440	TEMPE	2	0	0	0	0	24,000	5,468	29,468
441	MESA	1	0	0	0	0	24,000	5,468	29,468
442	MESA	4	0	0	0	0	24,000	8,068	32,068
443	MESA	1	0	0	0	0	24,000	5,468	29,468
444	TEMPE	61	0	0	0	0	24,000	53,628	77,628
445	TEMPE	24	0	0	0	0	24,000	24,602	48,602
446	TEMPE	0	0	1	0	0	24,000	41,820	65,820
447	TEMPE	2	0	0	0	0	24,000	5,468	29,468
448	TEMPE	3	0	0	0	0	24,000	5,468	29,468
449	TEMPE	1	0	0	0	0	24,000	5,468	29,468
450	MESA	2	0	0	0	0	24,000	5,468	29,468
451	TEMPE	1	0	0	0	0	24,000	5,468	29,468

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DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
452	TEMPE	1	0	0	0	0	24,000	5,468	29,468
453	TEMPE	4	0	0	0	0	24,000	8,068	32,068
454	TEMPE	1	0	0	0	0	24,000	5,468	29,468
455	TEMPE	2	0	0	0	0	24,000	5,468	29,468
456	TEMPE	7	0	0	0	0	24,000	16,136	40,136
457	TEMPE	1	0	0	0	0	24,000	5,468	29,468
458	TEMPE	2	0	0	0	0	24,000	5,468	29,468
459	TEMPE	1	0	0	0	0	24,000	5,468	29,468
460	TEMPE	9	0	0	0	0	24,000	24,204	48,204
461	PHOENIX	5	3	0	0	0	24,000	66,056	90,056
462	PHOENIX	13	1	0	0	0	24,000	47,472	71,472
463	PHOENIX	0	1	0	0	0	24,000	44,520	68,520
464	TEMPE	1	0	0	0	0	24,000	5,468	29,468
465	TEMPE	1	0	0	0	0	24,000	5,468	29,468
466	MESA	1	0	0	0	0	24,000	5,468	29,468
467	TEMPE	3	0	0	0	0	24,000	5,468	29,468
468	TEMPE	1	0	0	0	0	24,000	5,468	29,468
469	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
470	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
471	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
472	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
473	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
474	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
475	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
476	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
477	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
478	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
479	TEMPE	1	0	0	0	0	24,000	5,468	29,468
480	TEMPE	1	0	0	0	0	24,000	5,468	29,468
481	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
482	TEMPE	1	0	0	0	0	24,000	5,468	29,468
483	TEMPE	1	0	0	0	0	24,000	5,468	29,468
484	TEMPE	1	0	0	0	0	24,000	5,468	29,468
485	TEMPE	2	0	0	0	0	24,000	5,468	29,468
486	MESA	1	0	0	0	0	24,000	5,468	29,468
487	PHOENIX	18	1	0	0	0	24,000	48,210	72,210
488	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
489	MESA	2	0	0	0	0	24,000	5,468	29,468
490	MESA	7	0	0	0	0	24,000	16,136	40,136
491	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
492	MESA	2	0	0	0	0	24,000	5,468	29,468

DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
493	TEMPE	2	0	0	0	0	24,000	5,468	29,468
494	PHOENIX	6	0	0	0	0	24,000	16,136	40,136
495	PHOENIX	1	1	0	0	0	24,000	45,258	69,258
496	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
497	MESA	3	0	0	0	0	24,000	5,468	29,468
498	MESA	1	0	0	0	0	24,000	5,468	29,468
499	TEMPE	1	0	0	0	0	24,000	5,468	29,468
500	TEMPE	1	0	0	0	0	24,000	5,468	29,468
501	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
502	MEZA	1	0	0	0	0	24,000	5,468	29,468
503	MESA	2	0	0	0	0	24,000	5,468	29,468
504	MESA	3	0	0	0	0	24,000	5,468	29,468
505	MESA	1	0	0	0	0	24,000	5,468	29,468
506	MESA	1	0	0	0	0	24,000	5,468	29,468
507	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
508	MESA	1	0	0	0	0	24,000	5,468	29,468
509	MESA	1	0	0	0	0	24,000	5,468	29,468
510	MESA	1	0	0	0	0	24,000	5,468	29,468
511	MESA	2	0	0	0	0	24,000	5,468	29,468
512	MESA	3	0	0	0	0	24,000	5,468	29,468
513	MESA	1	0	0	0	0	24,000	5,468	29,468
514	MESA	2	0	0	0	0	24,000	5,468	29,468
515	TEMPE	2	0	0	0	0	24,000	5,468	29,468
516	MESA	1	0	0	0	0	24,000	5,468	29,468
517	MESA	2	0	0	0	0	24,000	5,468	29,468
518	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
519	PHOENIX	10	0	0	0	0	24,000	24,204	48,204
520		0	0	1	0	0	24,000	41,820	65,820
521	MESA	2	0	0	0	0	24,000	5,468	29,468
522	GILBERT	1	0	0	0	0	24,000	5,468	29,468
523	GILBERT	2	0	0	0	0	24,000	5,468	29,468
524	GILBERT	4	0	0	0	0	24,000	8,068	32,068
525	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
526	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
527	MESA	1	0	0	0	0	24,000	5,468	29,468
528	MESA	1	0	0	0	0	24,000	5,468	29,468
529	PHOENIX	3	0	0	0	0	24,000	5,468	29,468
530	PHOENIX	18	0	0	0	0	24,000	23,897	47,897
531	TEMPE	1	0	0	0	0	24,000	5,468	29,468
532	MESA	3	0	0	0	0	24,000	5,468	29,468
533	TEMPE	1	0	0	0	0	24,000	5,468	29,468

DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
534	MESA	1	0	0	0	0	24,000	5,468	29,468
535	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
536	GILBERT	2	0	0	0	0	24,000	5,468	29,468
537	GILBERT	1	0	0	0	0	24,000	5,468	29,468
538	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
539	CHANDLER	4	0	0	0	0	24,000	8,068	32,068
540	GILBERT	5	1	0	0	0	24,000	45,996	69,996
541	TEMPE	2	0	0	0	0	24,000	5,468	29,468
542	TEMPE	3	0	0	0	0	24,000	5,468	29,468
543	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
544	TEMPE	1	0	0	0	0	24,000	5,468	29,468
545	TEMPE	1	0	0	0	0	24,000	5,468	29,468
546	TEMPE	2	0	0	0	0	24,000	5,468	29,468
547	TEMPE	2	0	0	0	0	24,000	5,468	29,468
548	TEMPE	8	0	0	0	0	24,000	16,136	40,136
549	TEMPE	5	0	0	0	0	24,000	16,136	40,136
550	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
551	TEMPE	5	0	0	0	0	24,000	16,136	40,136
552	CHANDLER	2	0	0	0	0	24,000	5,468	29,468
553	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
554	PHOENIX	1	0	0	0	0	24,000	5,468	29,468
555	TEMPE	7	0	0	0	0	24,000	16,136	40,136
556	GILBERT	3	0	0	0	0	24,000	5,468	29,468
557	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
558	PHOENIX	2	0	0	0	0	24,000	5,468	29,468
559	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
560	TEMPE	1	0	0	0	0	24,000	5,468	29,468
561	CHANDLER	11	1	0	0	0	24,000	46,734	70,734
562	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
563	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
564	CHANDLER	8	0	0	0	0	24,000	16,136	40,136
565	CHANDLER	12	2	0	0	0	24,000	49,434	73,434
566	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
567	CHANDLER	2	0	0	0	0	24,000	5,468	29,468
568	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
569	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
570	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
571	CHANDLER	10	0	0	0	0	24,000	24,204	48,204
572	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
573	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
574	CHANDLER	1	0	0	0	0	24,000	5,468	29,468

DISTANCE BAND 2: 1,001 TO 2,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
575	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
576	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
577	CHANDLER	1	0	0	0	0	24,000	5,468	29,468
578	PICACHO	5	0	0	0	0	24,000	16,136	40,136
				Sub-Totals			$13,872,000	$5,323,750	
	# in this Study	3101					Sum of Total Cost		$19,195,750
	# in this Band	578					Average of Total Cost		$33,211
							% of Addresses in this Band		18.64%

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
2	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
3	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
4	PHOENIX	7	0	0	0	0	44,500	16,136	60,636
5	PHOENIX	10	0	0	0	0	44,500	24,204	68,704
6	PHOENIX	6	1	0	0	0	44,500	45,996	90,496
7	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
8	PHOENIX	0	8	0	0	0	44,500	66,512	111,012
9	PHOENIX	0	0	0	3	0	44,500	156,936	201,436
10	PHOENIX	33	8	0	0	0	44,500	93,460	137,960
11	PHOENIX	0	1	0	0	0	44,500	44,520	89,020
12	PHOENIX	12	0	0	0	0	44,500	24,204	68,704
13	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
14	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
15	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
16	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
17	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
18	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
19	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
20	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
21	SCOTTSDALE	6	0	0	0	0	44,500	16,136	60,636
22	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
23	PHOENIX	7	0	0	0	0	44,500	16,136	60,636
24	GLENDALE	1	1	0	0	0	44,500	45,258	89,758
25	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
26	PEORIA	1	0	0	0	0	44,500	5,468	49,968
27	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
28	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
29	PHOENIX	6	0	0	0	0	44,500	16,136	60,636
30	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
31	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
32	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
33	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
34	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
35	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
36	GLENDALE	2	0	0	0	0	44,500	5,468	49,968
37	PHOENIX	6	0	0	0	0	44,500	16,136	60,636
38	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
39	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
40	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
41	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
42	PHOENIX	8	0	0	0	0	44,500	16,136	60,636

DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
43	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
44	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
45	SCOTTSDA	1	0	0	0	0	44,500	5,468	49,968
46	SCOTTSDA	2	0	0	0	0	44,500	5,468	49,968
47	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
48	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
49	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
50	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
51	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
52	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
53	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
54	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
55	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
56	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
57	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
58	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
59	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
60	PHOENIX	8	1	0	0	0	44,500	45,996	90,496
61	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
62	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
63	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
64	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
65	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
66	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
67	SCOTTSDALE	4	0	0	0	0	44,500	8,068	52,568
68	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
69	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
70	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
71	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
72	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
73	SCOTTSDALE	4	0	0	0	0	44,500	8,068	52,568
74	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
75	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
76	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
77	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
78	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
79	GLENDALE	12	0	0	0	0	44,500	24,204	68,704
80	GLENDALE	3	0	0	0	0	44,500	5,468	49,968
81	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
82	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
83	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
84	YOUNGTOWN	0	1	0	0	0	44,500	44,520	89,020

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
85	SUN CITY	2	0	0	0	0	44,500	5,468	49,968
86	PEORIA	1	0	0	0	0	44,500	5,468	49,968
87	SURPRISE	3	0	0	0	0	44,500	5,468	49,968
88	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
89	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
90	PEORIA	1	0	0	0	0	44,500	5,468	49,968
91	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
92	GLENDALE	3	0	0	0	0	44,500	5,468	49,968
93	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
94	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
95	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
96	GLENDALE	39	2	0	0	0	44,500	74,873	119,373
97	PEORIA	1	0	0	0	0	44,500	5,468	49,968
98	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
99	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
100	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
101	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
102	PHOENIX	3	1	0	0	0	44,500	45,258	89,758
103	SCOTTSDALE	5	0	0	0	0	44,500	16,136	60,636
104	PHOENIX	17	0	0	0	0	44,500	23,897	68,397
105	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
106	PHOENIX	8	2	0	0	0	44,500	48,696	93,196
107	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
108	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
109	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
110	SCOTTSDALE	7	1	0	0	0	44,500	45,996	90,496
111	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
112	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
113	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
114	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
115	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
116	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
117	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
118	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
119	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
120	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
121	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
122	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
123	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
124	GLENDALE	2	0	0	0	0	44,500	5,468	49,968
125	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
126	PHOENIX	2	0	0	0	0	44,500	5,468	49,968

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
127	PEORIA	1	0	0	0	0	44,500	5,468	49,968
128	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
129	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
130	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
131	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
132	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
133	SCOTTSDALE	3	0	0	0	0	44,500	5,468	49,968
134	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
135	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
136	SCOTTSDALE	6	0	0	0	0	44,500	16,136	60,636
137	SCOTTSDALE	6	0	0	0	0	44,500	16,136	60,636
138	SCOTTSDALE	5	0	0	0	0	44,500	16,136	60,636
139	SCOTTSDA	0	1	0	0	0	44,500	44,520	89,020
140	SCOTTSDA	5	0	0	0	0	44,500	16,136	60,636
141	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
142	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
143	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
144	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
145	PEORIA	1	0	0	0	0	44,500	5,468	49,968
146	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
147	PEORIA	1	0	0	0	0	44,500	5,468	49,968
148	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
149	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
150	PEORIA	1	0	0	0	0	44,500	5,468	49,968
151	SCOTTSDALE	4	0	0	0	0	44,500	8,068	52,568
152	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
153	SCOTTSDALE	4	0	0	0	0	44,500	8,068	52,568
154	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
155	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
156	SCOTTSDALE	14	0	0	0	0	44,500	23,192	67,692
157	PHOENIX	6	0	0	0	0	44,500	16,136	60,636
158	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
159	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
160	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
161	SCOTTSDALE	10	0	0	0	0	44,500	24,204	68,704
162	SCOTTSDA	1	0	0	0	0	44,500	5,468	49,968
163	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
164	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
165	PARADISE VALLEY	1	0	0	0	0	44,500	5,468	49,968
166	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
167	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
168	PHOENIX	0	2	0	0	0	44,500	47,220	91,720

DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
169	SCOTTSDALE	3	0	0	0	0	44,500	5,468	49,968
170	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
171	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
172	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
173	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
174	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
175	PHOENIX	20	2	0	0	0	44,500	50,910	95,410
176	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
177	GLENDALE	1	0	0	0	0	44,500	5,468	49,968
178	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
179	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
180	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
181	PHOENIX	10	0	0	0	0	44,500	24,204	68,704
182	PHOENIX	1	2	0	0	0	44,500	47,958	92,458
183	SCOTTSDALE	3	0	0	0	0	44,500	5,468	49,968
184	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
185	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
186	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
187	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
188	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
189	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
190	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
191	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
192	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
193	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
194	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
195	PHOENIX	9	1	0	0	0	44,500	46,734	91,234
196	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
197	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
198	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
199	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
200	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
201	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
202	PHOENIX	21	0	0	0	0	44,500	24,602	69,102
203	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
204	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
205	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
206	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
207	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
208	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
209	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
210	PHOENIX	2	0	0	0	0	44,500	5,468	49,968

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
211	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
212	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
213	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
214	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
215	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
216	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
217	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
218	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
219	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
220	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
221	PHOENIX	16	0	0	0	0	44,500	23,192	67,692
222	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
223	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
224	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
225	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
226	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
227	SCOTTSDALE	7	0	0	0	0	44,500	16,136	60,636
228	SCOTTSDALE	6	0	0	0	0	44,500	16,136	60,636
229	SCOTTSDALE	5	0	0	0	0	44,500	16,136	60,636
230	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
231	SCOTTSDALE	5	0	0	0	0	44,500	16,136	60,636
232	SCOTTSDALE	9	0	0	0	0	44,500	24,204	68,704
233	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
234	PHOENIX	9	0	0	0	0	44,500	24,204	68,704
235	PHOENIX	14	0	0	0	0	44,500	23,192	67,692
236	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
237	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
238	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
239	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
240	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
241	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
242	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
243	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
244	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
245	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
246	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
247	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
248	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
249	SCOTTSDALE	10	0	0	0	0	44,500	24,204	68,704
250	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
251	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
252	SCOTTSDALE	10	0	0	0	0	44,500	24,204	68,704

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
253	SCOTTSDALE	7	0	0	0	0	44,500	16,136	60,636
254	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
255	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
256	SCOTTSDALE	2	0	0	0	0	44,500	5,468	49,968
257	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
258	SCOTTSDALE	21	0	0	0	0	44,500	24,602	69,102
259	PHOENIX	1	1	0	0	0	44,500	45,258	89,758
260	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
261	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
262	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
263	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
264	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
265	MESA	1	0	0	0	0	44,500	5,468	49,968
266	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
267	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
268	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
269	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
270	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
271	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
272	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
273	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
274	PHOENIX	27	0	0	0	0	44,500	25,307	69,807
275	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
276	PHOENIX	16	1	0	0	0	44,500	47,472	91,972
277	PHOENIX	15	2	0	0	0	44,500	50,172	94,672
278	PHOENIX	19	0	0	0	0	44,500	23,897	68,397
279	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
280	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
281	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
282	SCOTTSDALE	5	0	0	0	0	44,500	16,136	60,636
283	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
284	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
285	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
286	PHOENIX	13	1	0	0	0	44,500	47,472	91,972
287	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
288	SCOTTSDALE	4	0	0	0	0	44,500	8,068	52,568
289	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
290	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
291	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
292	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
293	MESA	1	0	0	0	0	44,500	5,468	49,968
294	PHOENIX	1	0	0	0	0	44,500	5,468	49,968

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
295	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
296	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
297	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
298	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
299	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
300	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
301	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
302	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
303	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
304	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
305	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
306	PHOENIX	9	0	0	0	0	44,500	24,204	68,704
307	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
308	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
309	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
310	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
311	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
312	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
313	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
314	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
315	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
316	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
317	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
318	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
319	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
320	PHOENIX	10	0	0	0	0	44,500	24,204	68,704
321	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
322	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
323	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
324	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
325	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
326	MESA	4	0	0	0	0	44,500	8,068	52,568
327	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
328	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
329	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
330	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
331	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
332	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
333	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
334	SCOTTSDALE	4	0	0	0	0	44,500	8,068	52,568
335	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
336	PHOENIX	1	0	0	0	0	44,500	5,468	49,968

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
337	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
338	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
339	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
340	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
341	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
342	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
343	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
344	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
345	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
346	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
347	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
348	MESA	1	0	0	0	0	44,500	5,468	49,968
349	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
350	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
351	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
352	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
353	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
354	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
355	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
356	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
357	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
358	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
359	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
360	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
361	SCOTTSDALE	1	0	0	0	0	44,500	5,468	49,968
362	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
363	TOLLESON	1	0	0	0	0	44,500	5,468	49,968
364	MESA	2	0	0	0	0	44,500	5,468	49,968
365	MESA	1	0	0	0	0	44,500	5,468	49,968
366	MESA	1	0	0	0	0	44,500	5,468	49,968
367	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
368	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
369	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
370	PHOENIX	40	0	0	0	0	44,500	47,794	92,294
371	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
372	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
373	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
374	TEMPE	1	0	0	0	0	44,500	5,468	49,968
375	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
376	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
377	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
378	PHOENIX	3	0	0	0	0	44,500	5,468	49,968

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
379	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
380	2	2	0	0	0	0	44,500	5,468	49,968
381	TOLLESON	1	0	0	0	0	44,500	5,468	49,968
382	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
383	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
384	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
385	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
386	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
387	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
388	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
389	TEMPE	1	0	0	0	0	44,500	5,468	49,968
390	TEMPE	1	0	0	0	0	44,500	5,468	49,968
391	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
392	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
393	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
394	PHOENIX	12	0	0	0	0	44,500	24,204	68,704
395	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
396	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
397	TOLLESON	3	0	0	0	0	44,500	5,468	49,968
398	PHOENIX	16	0	0	0	0	44,500	23,192	67,692
399	PHOENIX	5	0	0	0	0	44,500	16,136	60,636
400	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
401	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
402	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
403	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
404	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
405	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
406	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
407	PHOENIX	10	0	0	0	0	44,500	24,204	68,704
408	AVONDALE	1	0	0	0	0	44,500	5,468	49,968
409	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
410	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
411	GILBERT	1	0	0	0	0	44,500	5,468	49,968
412	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
413	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
414	MESA	2	0	0	0	0	44,500	5,468	49,968
415	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
416	TEMPE	5	0	0	0	0	44,500	16,136	60,636
417	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
418	GILBERT	1	0	0	0	0	44,500	5,468	49,968
419	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
420	GILBERT	1	0	0	0	0	44,500	5,468	49,968

Phoenix Fiber Study
Cost Model - Competitive Access Providers
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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
421	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
422	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
423	MESA	1	0	0	0	0	44,500	5,468	49,968
424	MESA	1	0	0	0	0	44,500	5,468	49,968
425	TEMPE	2	0	0	0	0	44,500	5,468	49,968
426	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
427	CHANDLER	2	0	0	0	0	44,500	5,468	49,968
428	TEMPE	1	0	0	0	0	44,500	5,468	49,968
429	TEMPE	3	0	0	0	0	44,500	5,468	49,968
430	TEMPE	1	0	0	0	0	44,500	5,468	49,968
431	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
432	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
433	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
434	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
435	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
436	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
437	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
438	FLORENCE	1	0	0	0	0	44,500	5,468	49,968
439	MESA	1	0	0	0	0	44,500	5,468	49,968
440	MESA	1	0	0	0	0	44,500	5,468	49,968
441	MESA	9	0	0	0	0	44,500	24,204	68,704
442	MESA	1	0	0	0	0	44,500	5,468	49,968
443	GILBERT	1	0	0	0	0	44,500	5,468	49,968
444	MESA	1	0	0	0	0	44,500	5,468	49,968
445	MESA	3	0	0	0	0	44,500	5,468	49,968
446	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
447	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
448	MESA	11	0	0	0	0	44,500	24,204	68,704
449	MESA	2	0	0	0	0	44,500	5,468	49,968
450	MESA	3	0	0	0	0	44,500	5,468	49,968
451	GILBERT	1	0	0	0	0	44,500	5,468	49,968
452	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
453	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
454	MESA	2	0	0	0	0	44,500	5,468	49,968
455	MESA	1	0	0	0	0	44,500	5,468	49,968
456	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
457	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
458	GILBERT	1	0	0	0	0	44,500	5,468	49,968
459	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
460	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
461	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
462	MESA	1	0	0	0	0	44,500	5,468	49,968

Phoenix Fiber Study
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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
463	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
464	MESA	1	0	0	0	0	44,500	5,468	49,968
465	MESA	2	0	0	0	0	44,500	5,468	49,968
466	MESA	1	0	0	0	0	44,500	5,468	49,968
467	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
468	MESA	2	0	0	0	0	44,500	5,468	49,968
469	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
470	TEMPE	1	0	0	0	0	44,500	5,468	49,968
471	TEMPE	1	0	0	0	0	44,500	5,468	49,968
472	TEMPE	1	0	0	0	0	44,500	5,468	49,968
473	TEMPE	1	0	0	0	0	44,500	5,468	49,968
474	TEMPE	17	0	0	0	0	44,500	23,897	68,397
475	TEMPE	4	0	0	0	0	44,500	8,068	52,568
476	PHOENIX	4	0	0	0	0	44,500	8,068	52,568
477	MESA	1	0	0	0	0	44,500	5,468	49,968
478	MESA	1	0	0	0	0	44,500	5,468	49,968
479	MESA	1	0	0	0	0	44,500	5,468	49,968
480	MESA	1	0	0	0	0	44,500	5,468	49,968
481	MESA	2	0	0	0	0	44,500	5,468	49,968
482	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
483	MESA	2	0	0	0	0	44,500	5,468	49,968
484	TEMPE	1	0	0	0	0	44,500	5,468	49,968
485	TEMPE	1	0	0	0	0	44,500	5,468	49,968
486	MESA	3	0	0	0	0	44,500	5,468	49,968
487	MESA	6	0	0	0	0	44,500	16,136	60,636
488	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
489	MESA	1	0	0	0	0	44,500	5,468	49,968
490	MESA	2	0	0	0	0	44,500	5,468	49,968
491	TEMPE	2	0	0	0	0	44,500	5,468	49,968
492	MESA	4	0	0	0	0	44,500	8,068	52,568
493	TEMPE	1	0	0	0	0	44,500	5,468	49,968
494	MESA	1	0	0	0	0	44,500	5,468	49,968
495	TEMPE	4	0	0	0	0	44,500	8,068	52,568
496	TEMPE	1	0	0	0	0	44,500	5,468	49,968
497	TEMPE	2	0	0	0	0	44,500	5,468	49,968
498	TEMPE	2	0	0	0	0	44,500	5,468	49,968
499	MESA	1	0	0	0	0	44,500	5,468	49,968
500	TEMPE	1	0	0	0	0	44,500	5,468	49,968
501	APACHE JUNCTION	3	0	0	0	0	44,500	5,468	49,968
502	TEMPE	1	0	0	0	0	44,500	5,468	49,968
503	GILBERT	4	0	0	0	0	44,500	8,068	52,568
504	TEMPE	17	0	0	0	0	44,500	23,897	68,397

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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
505	TEMPE	8	0	0	0	0	44,500	16,136	60,636
506	TEMPE	1	0	0	0	0	44,500	5,468	49,968
507	GILBERT	3	0	0	0	0	44,500	5,468	49,968
508	GILBERT	1	0	0	0	0	44,500	5,468	49,968
509	GILBERT	1	2	0	0	0	44,500	47,958	92,458
510	GILBERT	0	1	0	0	0	44,500	44,520	89,020
511	GILBERT	246	25	0	0	0	44,500	283,387	327,887
512	GILBERT	21	3	0	0	0	44,500	74,522	119,022
513	GILBERT	0	11	0	0	0	44,500	73,612	118,112
514	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
515	GILBERT	1	0	0	0	0	44,500	5,468	49,968
516	GILBERT	1	0	0	0	0	44,500	5,468	49,968
517	MESA	1	0	0	0	0	44,500	5,468	49,968
518	TEMPE	4	0	0	0	0	44,500	8,068	52,568
519	GILBERT	1	0	0	0	0	44,500	5,468	49,968
520	MESA	3	0	0	0	0	44,500	5,468	49,968
521	GILBERT	1	0	0	0	0	44,500	5,468	49,968
522	GILBERT	1	0	0	0	0	44,500	5,468	49,968
523	CHANDLER	4	0	0	0	0	44,500	8,068	52,568
524	TEMPE	3	0	0	0	0	44,500	5,468	49,968
525	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
526	TEMPE	1	0	0	0	0	44,500	5,468	49,968
527	TEMPE	2	0	0	0	0	44,500	5,468	49,968
528	TEMPE	2	0	0	0	0	44,500	5,468	49,968
529	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
530	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
531	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
532	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
533	PHOENIX	2	0	0	0	0	44,500	5,468	49,968
534	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
535	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
536	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
537	PHOENIX	1	0	0	0	0	44,500	5,468	49,968
538	PHOENIX	3	0	0	0	0	44,500	5,468	49,968
539	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
540	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
541	CHANDLER	3	0	0	0	0	44,500	5,468	49,968
542	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
543	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
544	CHANDLER	3	0	0	0	0	44,500	5,468	49,968
545	CHANDLER	11	2	0	0	0	44,500	49,434	93,934
546	CHANDLER	1	0	0	0	0	44,500	5,468	49,968

Phoenix Fiber Study
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DISTANCE BAND 3: 2,001 TO 4,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
547	CHANDLER	9	3	0	0	0	44,500	74,124	118,624
548	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
549	CHANDLER	11	0	0	0	0	44,500	24,204	68,704
550	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
551	CHANDLER	2	0	0	0	0	44,500	5,468	49,968
552	CHANDLER	2	0	0	0	0	44,500	5,468	49,968
553	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
554	CHANDLER	3	0	0	0	0	44,500	5,468	49,968
555	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
556	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
557	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
558	CHANDLER	1	0	0	0	0	44,500	5,468	49,968
559	CHANDLER	3	0	0	0	0	44,500	5,468	49,968
560	SACATON	1	0	0	0	0	44,500	5,468	49,968
561	ELOY	2	0	0	0	0	44,500	5,468	49,968
				Sub-Totals			$24,964,500	$5,703,867	
	# in this Study	3101						Sum of Total Cost	$30,668,367
	# in this Band	561						Average of Total Cost	$54,667
								% of Addresses in this Band	18.09%

Phoenix Fiber Study
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DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
1	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
2	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
3	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
4	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
5	PHOENIX	8	0	0	0	0	63,000	16,136	79,136
6	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
7	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
8	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
9	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
10	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
11	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
12	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
13	PHOENIX	8	1	0	0	0	63,000	45,996	108,996
14	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
15	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
16	PHOENIX	7	0	0	0	0	63,000	16,136	79,136
17	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
18	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
19	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
20	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
21	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
22	CAVE CREEK	1	0	0	0	0	63,000	5,468	68,468
23	PEORIA	1	0	0	0	0	63,000	5,468	68,468
24	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
25	PEORIA	1	0	0	0	0	63,000	5,468	68,468
26	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
27	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
28	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
29	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
30	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
31	PEORIA	1	0	0	0	0	63,000	5,468	68,468
32	GLENDALE	3	0	0	0	0	63,000	5,468	68,468
33	PHOENIX	4	0	0	0	0	63,000	8,068	71,068
34	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
35	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
36	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
37	PEORIA	3	0	0	0	0	63,000	5,468	68,468
38	SCOTTSDA	1	0	0	0	0	63,000	5,468	68,468
39	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
40	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
41	SCOTTSDA	1	0	0	0	0	63,000	5,468	68,468

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DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
42	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
43	SCOTTSDA	1	0	0	0	0	63,000	5,468	68,468
44	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
45	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
46	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
47	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
48	PHOENIX	6	0	0	0	0	63,000	16,136	79,136
49	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
50	SCOTTSDALE	8	0	0	0	0	63,000	16,136	79,136
51	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
52	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
53	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
54	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
55	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
56	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
57	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
58	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
59	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
60	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
61	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
62	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
63	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
64	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
65	PHOENIX	39	0	0	0	0	63,000	47,794	110,794
66	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
67	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
68	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
69	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
70	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
71	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
72	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
73	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
74	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
75	SCOTTSDALE	4	0	0	0	0	63,000	8,068	71,068
76	PEORIA	1	0	0	0	0	63,000	5,468	68,468
77	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
78	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
79	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
80	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
81	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
82	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468

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DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
83	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
84	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
85	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
86	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
87	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
88	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
89	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
90	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
91	PHEONIX	7	0	0	0	0	63,000	16,136	79,136
92	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
93	SCOTTSDALE	6	0	0	0	0	63,000	16,136	79,136
94	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
95	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
96	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
97	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
98	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
99	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
100	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
101	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
102	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
103	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
104	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
105	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
106	PHOENIX	10	0	0	0	0	63,000	24,204	87,204
107	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
108	PEORIA	1	0	0	0	0	63,000	5,468	68,468
109	PEORIA	1	0	0	0	0	63,000	5,468	68,468
110	PHOENIX	4	0	0	0	0	63,000	8,068	71,068
111	SUN CITY	1	0	0	0	0	63,000	5,468	68,468
112	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
113	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
114	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
115	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
116	SUN CITY	1	0	0	0	0	63,000	5,468	68,468
117	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
118	PHOENIX	38	2	0	0	0	63,000	74,873	137,873
119	SUN CITY	2	0	0	0	0	63,000	5,468	68,468
120	SUN CITY	2	0	0	0	0	63,000	5,468	68,468
121	PHOENIX	4	0	0	0	0	63,000	8,068	71,068
122	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
123	PHOENIX	2	0	0	0	0	63,000	5,468	68,468

Phoenix Fiber Study
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DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
124	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
125	SCOTTSDALE	4	0	0	0	0	63,000	8,068	71,068
126	SCOTTSDALE	2	0	0	0	0	63,000	5,468	68,468
127	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
128	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
129	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
130	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
131	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
132	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
133	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
134	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
135	SCOTTSDALE	4	0	0	0	0	63,000	8,068	71,068
136	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
137	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
138	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
139	SCOTTSDALE	0	1	0	0	0	63,000	44,520	107,520
140	SCOTTSDALE	1	4	0	0	0	63,000	60,150	123,150
141	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
142	PHOENIX	14	0	0	0	0	63,000	23,192	86,192
143	PHOENIX	11	0	0	0	0	63,000	24,204	87,204
144	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
145	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
146	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
147	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
148	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
149	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
150	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
151	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
152	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
153	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
154	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
155	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
156	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
157	SCOTTSDA	3	0	0	0	0	63,000	5,468	68,468
158	PEORIA	3	0	0	0	0	63,000	5,468	68,468
159	PARADISE LLEY	1	0	0	0	0	63,000	5,468	68,468
160	PARADISE VALLEY	2	0	0	0	0	63,000	5,468	68,468
161	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
162	PEORIA	1	0	0	0	0	63,000	5,468	68,468
163	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
164	GLENDALE	1	0	0	0	0	63,000	5,468	68,468

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DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
165	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
166	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
167	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
168	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
169	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
170	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
171	PARADISE VALL	1	0	0	0	0	63,000	5,468	68,468
172	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
173	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
174	GLENDALE	9	1	0	0	0	63,000	46,734	109,734
175	SCOTTSDALE	6	0	0	0	0	63,000	16,136	79,136
176	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
177	GLENDALE	6	0	0	0	0	63,000	16,136	79,136
178	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
179	GLENDALE	4	0	0	0	0	63,000	8,068	71,068
180	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
181	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
182	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
183	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
184	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
185	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
186	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
187	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
188	QUEEN CREEK	1	0	0	0	0	63,000	5,468	68,468
189	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
190	GLENDALE	3	0	0	0	0	63,000	5,468	68,468
191	PHOENIX	4	0	0	0	0	63,000	8,068	71,068
192	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
193	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
194	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
195	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
196	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
197	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
198	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
199	PHOENIX	5	0	0	0	0	63,000	16,136	79,136
200	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
201	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
202	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
203	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
204	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
205	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468

DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
206	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
207	SCOTTSDALE	10	0	0	0	0	63,000	24,204	87,204
208	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
209	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
210	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
211	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
212	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
213	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
214	GLENDALE	2	0	0	0	0	63,000	5,468	68,468
215	PHOENIX	5	0	0	0	0	63,000	16,136	79,136
216	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
217	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
218	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
219	PHOENIX	4	0	0	0	0	63,000	8,068	71,068
220	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
221	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
222	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
223	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
224	PHOENIX	10	0	0	0	0	63,000	24,204	87,204
225	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
226	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
227	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
228	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
229	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
230	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
231	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
232	PHOENIX	4	0	0	0	0	63,000	8,068	71,068
233	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
234	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
235	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
236	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
237	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
238	SCOTTSDALE	3	0	0	0	0	63,000	5,468	68,468
239	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
240	SCOTTSDALE	5	0	0	0	0	63,000	16,136	79,136
241	MESA	1	0	0	0	0	63,000	5,468	68,468
242	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
243	AVONDALE	1	0	0	0	0	63,000	5,468	68,468
244	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
245	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
246	PHOENIX	1	0	0	0	0	63,000	5,468	68,468

DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
247	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
248	PHOENIX	1	0	0	0	0	63,000	5,458	68,468
249	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
250	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
251	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
252	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
253	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
254	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
255	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
256	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
257	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
258	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
259	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
260	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
261	MESA	1	0	0	0	0	63,000	5,468	68,468
262	MESA	1	0	0	0	0	63,000	5,468	68,468
263	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
264	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
265	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
266	MESA	2	0	0	0	0	63,000	5,468	68,468
267	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
268	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
269	MESA	1	0	0	0	0	63,000	5,468	68,468
270	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
271	MESA	1	0	0	0	0	63,000	5,468	68,468
272	TEMPE	3	0	0	0	0	63,000	5,468	68,468
273	MESA	3	0	0	0	0	63,000	5,468	68,468
274	MESA	1	0	0	0	0	63,000	5,468	68,468
275	SCOTTSDALE	1	0	0	0	0	63,000	5,468	68,468
276	TOLLESON	1	0	0	0	0	63,000	5,468	68,468
277	TOLLESON	1	0	0	0	0	63,000	5,468	68,468
278	MESA	2	0	0	0	0	63,000	5,468	68,468
279	MESA	3	0	0	0	0	63,000	5,468	68,468
280	GILBERT	1	0	0	0	0	63,000	5,468	68,468
281	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
282	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
283	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
284	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
285	TOLLESON	3	0	0	0	0	63,000	5,468	68,468
286	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
287	MESA	1	0	0	0	0	63,000	5,468	68,468

DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
288	MESA	1	0	0	0	0	63,000	5,468	68,468
289	TOLLESON	1	0	0	0	0	63,000	5,468	68,468
290	PHOENIX	8	0	0	0	0	63,000	16,136	79,136
291	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
292	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
293	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
294	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
295	PHOENIX	5	0	0	0	0	63,000	16,136	79,136
296	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
297	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
298	MESA	1	0	0	0	0	63,000	5,468	68,468
299	MESA	1	0	0	0	0	63,000	5,468	68,468
300	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
301	HIGLEY	1	0	0	0	0	63,000	5,468	68,468
302	MESA	2	0	0	0	0	63,000	5,468	68,468
303	MESA	7	1	0	0	0	63,000	45,996	108,996
304	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
305	MESA	3	0	0	0	0	63,000	5,468	68,468
306	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
307	MESA	1	0	0	0	0	63,000	5,468	68,468
308	CHANDLER	3	0	0	0	0	63,000	5,468	68,468
309	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
310	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
311	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
312	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
313	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
314	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
315	MESA	1	0	0	0	0	63,000	5,468	68,468
316	MESA	1	0	0	0	0	63,000	5,468	68,468
317	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
318	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
319	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
320	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
321	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
322	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
323	PHOENIX	3	0	0	0	0	63,000	5,468	68,468
324	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
325	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
326	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
327	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
328	PHOENIX	1	0	0	0	0	63,000	5,468	68,468

DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
329	PHOENIX	5	0	0	0	0	63,000	16,136	79,136
330	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
331	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
332	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
333	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
334	PHOENIX	0	0	1	0	0	63,000	41,820	104,820
335	PHOENIX	171	19	0	0	0	63,000	213,345	276,345
336	PHOENIX	22	0	0	0	0	63,000	24,602	87,602
337	PHOENIX	0	0	0	0	1	63,000	62,021	125,021
338	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
339	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
340	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
341	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
342	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
343	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
344	MESA	1	0	0	0	0	63,000	5,468	68,468
345	TEMPE	2	0	0	0	0	63,000	5,468	68,468
346	TEMPE	1	0	0	0	0	63,000	5,468	68,468
347	TEMPE	1	0	0	0	0	63,000	5,468	68,468
348	TEMPE	2	0	0	0	0	63,000	5,468	68,468
349	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
350	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
351	TEMPE	3	0	0	0	0	63,000	5,468	68,468
352	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
353	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
354	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
355	MESA	2	0	0	0	0	63,000	5,468	68,468
356	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
357	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
358	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
359	MESA	1	0	0	0	0	63,000	5,468	68,468
360	MESA	1	0	0	0	0	63,000	5,468	68,468
361	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
362	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
363	MESA	1	0	0	0	0	63,000	5,468	68,468
364	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
365	GLENDALE	1	0	0	0	0	63,000	5,468	68,468
366	MESA	2	0	0	0	0	63,000	5,468	68,468
367	TOLLESON	1	0	0	0	0	63,000	5,468	68,468
368	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
369	GILBERT	5	0	0	0	0	63,000	16,136	79,136

DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
370	MESA	1	0	0	0	0	63,000	5,468	68,468
371	MESA	1	0	0	0	0	63,000	5,468	68,468
372	MESA	1	0	0	0	0	63,000	5,468	68,468
373	MESA	1	0	0	0	0	63,000	5,468	68,468
374	PHOENIX	4	0	0	0	0	63,000	8,068	71,068
375	MESA	4	0	0	0	0	63,000	8,068	71,068
376	MESA	2	0	0	0	0	63,000	5,468	68,468
377	TEMPE	1	0	0	0	0	63,000	5,468	68,468
378	MESA	1	0	0	0	0	63,000	5,468	68,468
379		1	0	0	0	0	63,000	5,468	68,468
380	MESA	2	0	0	0	0	63,000	5,468	68,468
381		1	0	0	0	0	63,000	5,468	68,468
382	MESA	4	0	0	0	0	63,000	8,068	71,068
383		1	0	0	0	0	63,000	5,468	68,468
384	MESA	1	0	0	0	0	63,000	5,468	68,468
385	MESA	1	0	0	0	0	63,000	5,468	68,468
386	MESA	1	0	0	0	0	63,000	5,468	68,468
387	MESA	3	0	0	0	0	63,000	5,468	68,468
388	TEMPE	3	0	0	0	0	63,000	5,468	68,468
389	GILBERT	4	0	0	0	0	63,000	8,068	71,068
390	PHOENIX	2	0	0	0	0	63,000	5,468	68,468
391	TEMPE	8	0	0	0	0	63,000	16,136	79,136
392	GILBERT	2	0	0	0	0	63,000	5,468	68,468
393	TEMPE	2	0	0	0	0	63,000	5,468	68,468
394	TEMPE	5	2	0	0	0	63,000	48,696	111,696
395	GILBERT	1	0	0	0	0	63,000	5,468	68,468
396	GILBERT	1	0	0	0	0	63,000	5,468	68,468
397	TEMPE	2	0	0	0	0	63,000	5,468	68,468
398	GILBERT	1	0	0	0	0	63,000	5,468	68,468
399	TEMPE	7	0	0	0	0	63,000	16,136	79,136
400	TEMPE	3	0	0	0	0	63,000	5,468	68,468
401	GILBERT	1	0	0	0	0	63,000	5,468	68,468
402	GILBERT	1	0	0	0	0	63,000	5,468	68,468
403	GILBERT	3	0	0	0	0	63,000	5,468	68,468
404	GILBERT	1	0	0	0	0	63,000	5,468	68,468
405	TEMPE	3	0	0	0	0	63,000	5,468	68,468
406	TEMPE	4	0	0	0	0	63,000	8,068	71,068
407	TEMPE	1	0	0	0	0	63,000	5,468	68,468
408	TEMPE	2	0	0	0	0	63,000	5,468	68,468
409	GILBERT	4	0	0	0	0	63,000	8,068	71,068
410	GILBERT	1	2	0	0	0	63,000	47,958	110,958

DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
411	MESA	1	0	0	0	0	63,000	5,468	68,468
412	MESA	4	0	0	0	0	63,000	8,068	71,068
413	MESA	1	0	0	0	0	63,000	5,468	68,468
414	MESA	4	0	0	0	0	63,000	8,068	71,068
415	GILBERT	4	0	0	0	0	63,000	8,068	71,068
416	PHOENIX	9	0	0	0	0	63,000	24,204	87,204
417	TEMPE	1	0	0	0	0	63,000	5,468	68,468
418	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
419	TEMPE	1	0	0	0	0	63,000	5,468	68,468
420	TEMPE	1	0	0	0	0	63,000	5,468	68,468
421	GILBERT	3	0	0	0	0	63,000	5,468	68,468
422	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
423	CHANDLER	25	1	0	0	0	63,000	49,686	112,686
424	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
425	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
426	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
427	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
428	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
429	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
430	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
431	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
432	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
433	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
434	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
435	PHOENIX	1	0	0	0	0	63,000	5,468	68,468
436	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
437	CHANDLER	21	1	0	0	0	63,000	48,948	111,948
438	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
439	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
440	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
441	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
442	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
443	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
444	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
445	CHANDLER	3	0	0	0	0	63,000	5,468	68,468
446	CHANDLER	24	1	0	0	0	63,000	48,948	111,948
447	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
448	CHANDLER	3	0	0	0	0	63,000	5,468	68,468
449	CHANDLER	3	0	0	0	0	63,000	5,468	68,468
450	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
451	CHANDLER	1	0	0	0	0	63,000	5,468	68,468

DISTANCE BAND 4: 4,001 TO 9,000 FT FROM NEAREST CAP FIBER ROUTE

KEY	CITY	DS1	DS3	OC-3	OC-12	OC-48	PATH COST	EQPT COST	TOTAL COST
452	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
453	CHANDLER	2	0	0	0	0	63,000	5,468	68,468
454	CHANDLER	1	0	0	0	0	63,000	5,468	68,468
				Sub-Totals			$28,602,000	$3,689,231	

# in this Study	3101	Sum of Total Cost	$32,291,231
# in this Band	454	Average of Total Cost	$71,126
		% of Addresses in this Band	14.64%

9

PROFILE

POWER ENGINEERS, INC.

PROFILE

POWER ENGINEERS, INC.

POWER Engineers, Inc. (POWER) is a consulting engineering firm headquartered in Idaho with offices located throughout the United States and overseas. Since its beginning 20 years ago, POWER has grown from a staff of three to a firm which now employs over 400. Through growth and diversification, POWER has become a multidisciplinary consulting firm specializing in many technical areas. POWER's full-service capabilities provide integrated services from preliminary planning stages through construction and close-out. Its professional staff includes engineers in the following disciplines:

- Project Management
- **Communications**
- **GIS / GPS**
- Mechanical
- Electrical
- Geotechnical
- Controls
- Combustion
- SCADA
- Structural / Architectural
- Civil
- Chemical
- Petroleum
- Mining
- Environmental
- Thermography
- **Training Development / Delivery**

Staff and/or field office locations include:

- Phoenix, AZ
- Denver, CO
- Atlanta, GA
- Boise, ID
- Hailey, ID
- St. Louis, MO
- Mindanao, The Philippines
- Portland, OR
- Austin, TX

POWER has been recognized as one of the top ten engineering consulting firms in the country by trade publications, i.e., "*Consulting - Specifying Engineer*", etc.

POWER Engineers, Inc.

ICS DIVISION

LINES OF BUSINESS

- TELEPHONY
  - Traditional Outside Plant Planning & Design (Copper, Fiber, SLE, etc.)
  - Data Base Administration
  - Records Management
- BROADBAND PLANNING & DESIGN
  - Video & Data Transport Systems
  - Energy Management Systems (Distribution & Substation)
- RF / CELLULAR / PCS
  - Design
  - Site Acquisition
- SYSTEMS DESIGN
  - Inside Plant Design & Engineering
  - LAN/WAN Networks
  - SONET
- GIS / GPS SERVICES
  - Conversion
  - Analysis
  - Application Development
- TRAINING DEVELOPMENT & DELIVERY
  - Instructional Design (Job Studies, Needs Assessment, etc.)
  - Interactive Multimedia
  - Computer Based Training (CBT)
  - Electronic Support Systems
  - OSP Engineering Training (Instructors)
  - Construction / I & M Training (Instructors)
- ETC.

POWER Engineers, Inc.

ICS DIVISION

REPRESENTATIVE CLIENT LIST

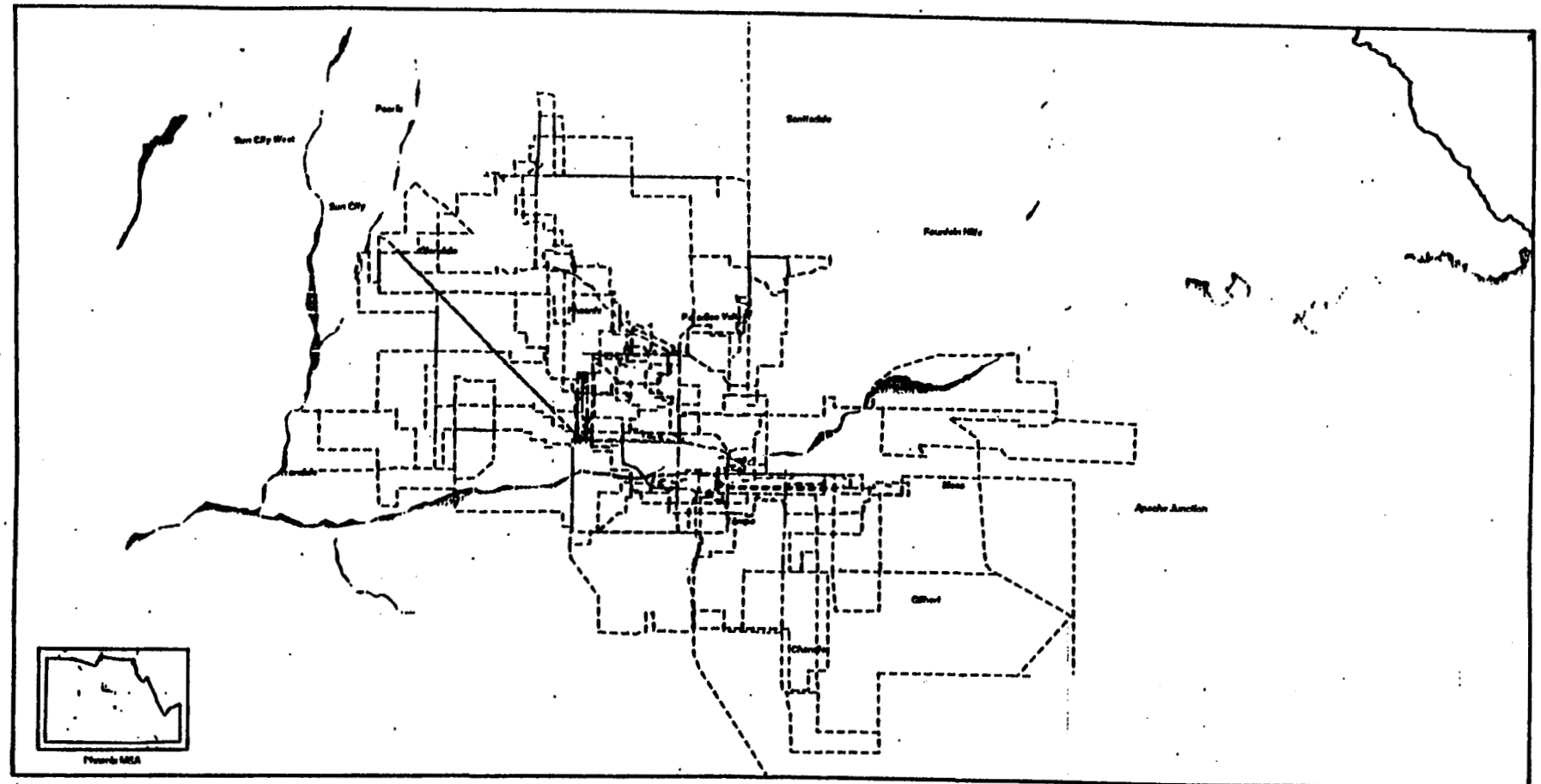
- AT & T
- CENTRAL & SOUTH WEST UTILITIES
- CITIZENS TELEPHONE (& UTILITY)
- COX COMMUNICATIONS
- CUSTER TELEPHONE (INDEPENDENT)
- FIBERLINK
- JONES LIGHTWAVE
- LUCENT TECHNOLOGIES
- MCI
- MICRON
- R & L ELECTRONICS
- TCI
- U S GOVERNMENT (GEOLOGICAL SURVEY)
- U S SPRINT COMMUNICATIONS CO.
- U S WEST COMMUNICATIONS

IX.

QUALIFICATIONS OF POWER ENGINEERS, INC.

POWER Engineers, Inc. is a company qualified to complete engineering, and related, work in the communications environment. The communications engineering division is also supported with expertise in all the professional engineering disciplines and a complete, state of the art GIS operation.

The following pages describe POWER in terms of a brief profile, communications lines of business, and a representative client list.



Notes
1 Sources Quality Strategies and U S WEST Customer Billing Records
2 90% of the U S WEST DS1 Equivalent Services are within 1000 FT of Competitive Provider Coverage

Legend

---- Competitive Access Provider Fiber

Major Roads

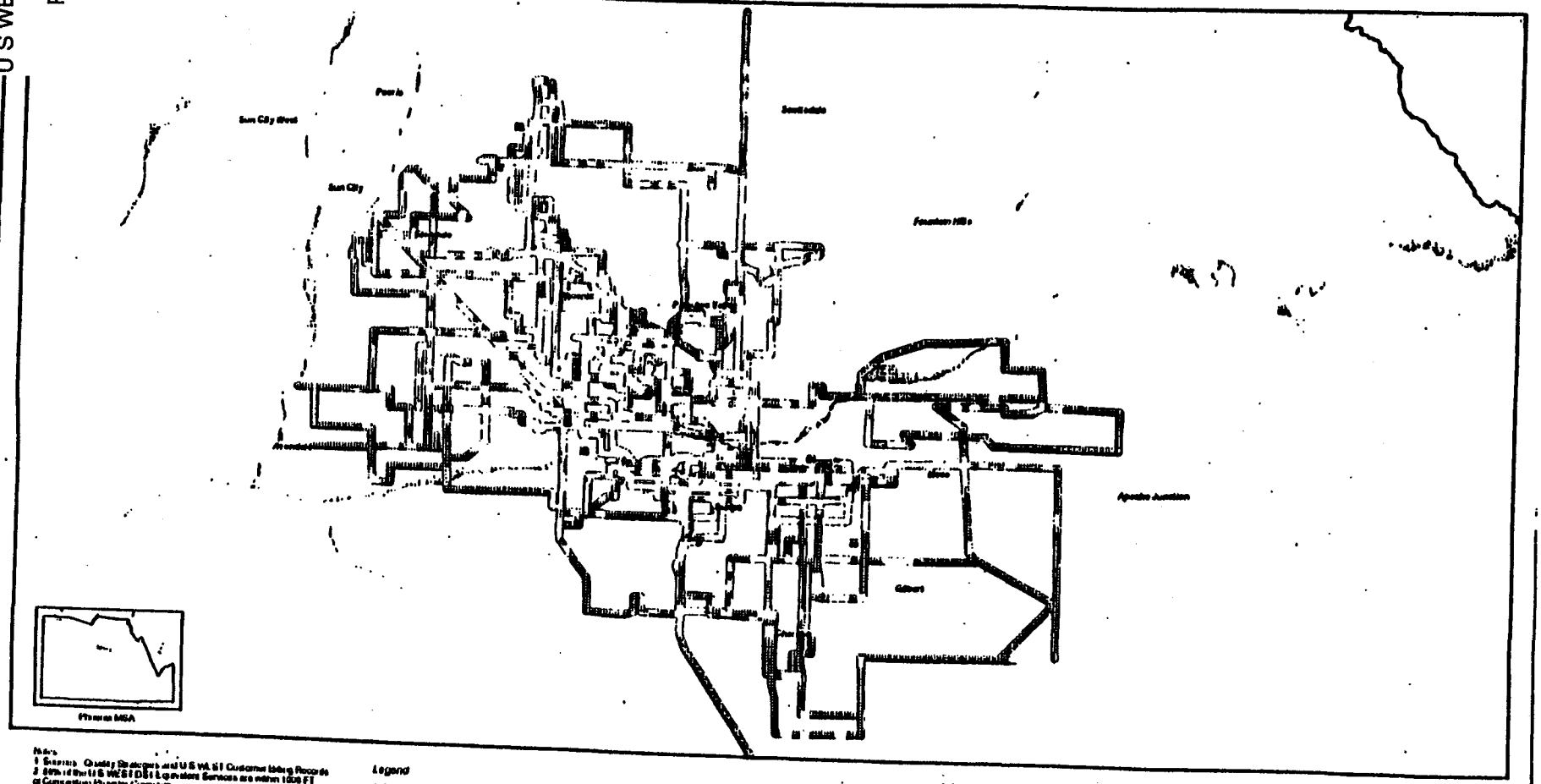
N

1 Inch = 5 miles

U S WEST

Competitive Provider Coverage of U S WEST DS1 Equivalent Services

U S WEST



Notes
1 Sources: Quality Strategies and U S WEST Customer Billing Records
2 [illegible] of the U S WEST DS1 Equivalent Services are within 1000 FT of Competitive Provider Coverage

Legend
DS1 Equivalent
1 to 10
11 to 30
31 to 100
101 to 1000
>- 1000
Buffer area within 1000 ft of CAP Fiber
Major Roads

N
1 inch = 5 miles
U S WEST

Competitive Provider Coverage of U S WEST DS1 Equivalent Services

U S WEST

CERTIFICATE OF SERVICE

I, Kelseau Powe, Jr., do hereby certify that on this 24th day of August, 1998, I have caused a copy of the foregoing **PETITION OF U S WEST COMMUNICATIONS, INC. FOR FORBEARANCE** to be served, via hand delivery, upon the persons listed on the attached service list.

Kelseau Powe, Jr.

William E. Kennard
Federal Communications Commission
Room 814
1919 M Street, N.W.
Washington, DC 20554

Gloria Tristani
Federal Communications Commission
Room 826
1919 M Street, N.W.
Washington, DC 20554

Michael K. Powell
Federal Communications Commission
Room 844
1919 M Street, N.W.
Washington, DC 20554

Harold Furchtgott-Roth
Federal Communications Commission
Room 802
1919 M Street, N.W.
Washington, DC 20554

Susan P. Ness
Federal Communications Commission
Room 832
1919 M Street, N.W.
Washington, DC 20554

James D. Schlichting
Federal Communications Commission
Room 518
1919 M Street, N.W.
Washington, DC 20554

Jane E. Jackson
Federal Communications Commission
Room
1919 M Street, N.W.
Washington, DC 20554

Kathryn C. Brown
Federal Communications Commission
Room 500
1919 M Street, N.W.
Washington, DC 20554

Kathryn Schroeder
Federal Communications Commission
Room 518
1919 M Street, N.W.
Washington, DC 20554

Richard Lerner
Federal Communications Commission
Room 518
1919 M Street, N.W.
Washington, DC 20554

Judith A. Nitsche
Federal Communications Commission
Room 518
1919 M Street, N.W.
Washington, DC 20554

Lenworth Smith
Federal Communications Commission
Room 518
1919 M Street, N.W.
Washington, DC 20554

Jay M. Atkinson
Federal Communications Commission
Room 528-C
1919 M Street, N.W.
Washington, DC 20554

Tamara Preiss
Federal Communications Commission
Room 518-D
1919 M Street, N.W.
Washington, DC 20554

International Transcription
Services, Inc.
1231 20th Street, N.W.
Washington, DC 20036

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TCG®

AT&T Completes TCG merger;
TCG Now Core of AT&T Local Services Network Unit.
Read More.

Enhanced Data Services

Products and Services

TCG's extensive portfolio of fully managed Data services are designed to address a wide variety of networking needs. Not only can TCG furnish solutions for your data networking needs today, but TCG can also provide you a graceful migration path to new broadband networking solutions for the future. After assessing the total cost of ownership, TCG's data solutions offer more scalable and fault-tolerant solutions at a lower aggregate cost than compared to building your own dedicated data network.

These competitively priced services are provided over highly reliable, state-of-the-art ATM and fiber optic networks.

TCG's complete set of Data Services include:

- OmniLAN℠ - Transparent LAN Services
- OmniStream℠ ATM - Native ATM Services
- OmniStream℠ Frame Relay - Enhanced Frame Relay Services

WHAT'S NEW
ABOUT TCG
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Private Line Services
Switched Services
Enhanced Data Services
Wireless Services
What Makes Us Special
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TCG

AT&T Completes TCG merger;
TCG Now Core of AT&T Local Services Network Unit.
Read More.

Private Line Services

Products and Services

Looking for someone who can provide you with a private line service that not only fits your needs but gives you the features, reliability and support you want?

Let TCG bring your plans to reality with our host of private line services. Click on any item below to learn more:

- OmniRing(sm) SONET Services
  If you're looking for a network that has enhanced survivability, advanced architectures and centralized monitoring capabilities, this one is for you.
- OmniRing(sm) DS0
  For basic 2-wire, 4-wire and DDS private line applications, including FX lines, Tie Trunks, Ringdown and "Hoot & Holler" circuits.
- OmniRing(sm) DS1
  A midrange service for companies with high volumes to multiple sites, an Interexchange Carrier or to another high-volume location.
- OmniRing(sm) DS3
  A high-capacity service for users with high-traffic volumes between locations, including Interexchange Carriers and large businesses.

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TCG®

AT&T Completes TCG merger;
TCG Now Core of AT&T Local Services Network Unit.
Read More.

Switched Services

Products and Services

At TCG, we offer a series of switched services that are backed by our guaranteed, reliable and disaster-resistant SONET fiber optic backbone network.

Together with 24 hour performance monitoring, fully redundant architecture and a 4 way uninterrupted power supply backup for all critical switching components, TCG offers you the services that you need with the reliability that you deserve!

Select one of the following switched services to learn more:

- PrimeReach(sm) Service
  Affordable, reliable regional services without having to give up your existing local area services.
- PrimeXpress(sm) Service
  A premiere switched line of business digital trunking service providing PBX users with access to TCG's switching center and switch-resident calling services.
- IXC Gateway Service(sm)
  Provides Interexchange Carriers an alternative to switched offerings provided by the incumbent Local Exchange Companies.
- PrimePath(sm) Service
  A reliable local calling service with access to your choice of long distance carriers.
- PrimePlex(sm) Services
  Flexible ISDN services that give you productivity enhancing power to meet the demands of today and the challenges of tomorrow.
- PrimeNBX(sm)
  A shared PBX service that is a flexible

WHAT'S NEW
ABOUT TCG
INVESTOR RELATIONS
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REGULATORY ISSUES
PRODUCTS & SERVICES
The TCG Difference
TCG Product Line
Private Line Services
Switched Services
Enhanced Data Services
Wireless Services
What Makes Us Special
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telecommunications solution for your business.

- PrimeCard(sm)
  Calling card solutions

- PrimeOne(sm) & PrimePlus(sm)
  Local & Toll Usage Plans

- TCG USA(sm)
  TCG's United Savings Advantage qualifies you for volume discounts based on your services with us in two or more cities!

- PrimeDistance(sm) Service
  Providing the highest quality service for all domestic and international long-distance calls - all at competitive rates.

- CERFtone(sm) Service
  An integrated Voice and Internet solution for Business, from America's Premier Local Telecommunications Provider.

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TCG®

AT&T Completes TCG merger;
TCG Now Core of AT&T Local Services Network Unit.
Read More.

Go The "Last Mile" with TCG!

In today's competitive business marketplace, the timely and reliable transmission of information is imperative. Many companies cannot afford the repercussions of network downtime caused by cable cuts and wire/central office outages. Still other businesses are expanding so rapidly that new lines of communication must be set up or old ones reconfigured in a matter of days. How do we at TCG address these issues?

OmniWave® services are TCG's wireless answer to addressing the high speed digital broadband needs of our customers for the "last mile" access to their buildings. We call them "OmniWave® Services" as they are in the high frequency micro*wave*, or to get really specific, milliwave, radio frequency range.

TCG OmniWave® Services is the brand name given to our broadband, fixed point-to-point wireless services. They are comparable in application and in service level to TCG's fiber-based services.

OmniWave® Services can be used to provide private line, switched, Internet and data services (LAN extensions) over TCG's 38 GHz licensed spectrum. They are the wireless version of DS1s and DS3s. Three radios are currently available: 4 DS1, 8 DS1, and 1 DS3.

This access can apply when existing fiber does not reach the destination building or as a diversity supplement when needed to support existing fiber. Now customers of all types, carriers, corporations, small businesses, MDUs, the list goes on, can get directly onto TCG's network, by-passing the LEC, in a way that is often cheaper and faster than installing traditional fiber.

What Are the Advantages of Using OmniWave®?

WHAT'S NEW
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Private Line Services
Switched Services
Enhanced Data Services
Wireless Services
What Makes Us Special
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YES - Wireless Works!

View Fact Sheet on OmniWave® Network (HTML)
Download the Fact Sheet on OmniWave® Network (Adobe Acrobat)

View Fact Sheet on OmniWave® Point-to-Point (HTML)
Download the Fact Sheet on OmniWave® Point-to-Point (Adobe Acrobat)

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Company Description

Founded in 1990, Electric Lightwave Inc. (NASDAQ: ELIX) is an integrated communications provider offering data, Internet access, and broadband transport services to businesses nationwide. In the western United States, the company is a full-service provider offering local and long distance telephone service, videoconferencing, and prepaid services to business customers.

Rated as the "nation's third best overall value" for Internet backbones by Boardwatch Magazine, Electric Lightwave builds and operates all-digital, high-speed fiber-optic networks for businesses and long-distance carriers across the United States. In 1998, the company completed an ATM (Asynchronous Transfer Mode) network upgrade that delivers ultra high-speed transmission and increases bandwidth efficiency over its network. Electric Lightwave is currently building additional SONET-based long-haul routes and ringed Metropolitan Area Networks (MANs) in the Western United States. This will enable Electric Lightwave to offer its full suite of services over one broadband network. When completed, Electric Lightwave's Western SONET-ring network of more than 4,500 miles will deliver unmatched speed, reliability, and advanced capabilities to customers — all at extremely competitive prices.

Corporate Customer Profile

Electric Lightwave offers services to medium-to-large "communications-intensive" organizations, often with multiple locations, representing a broad range of industries: financial services, health care, education, legal services, technology, web-centric, and other organizations dependent on the reliable transfer of and access to information.

Wholesale Customer Profile

Electric Lightwave offers services to national and local interexchange carriers as well as wireless providers who value the company's diversity, flexibility, security, efficiency, and network management capabilities.

Products and Services

In the western United States, Electric Lightwave offers a full-suite of integrated communications services including: local phone service, switched and dedicated long distance, private networks, advanced data services and Internet access, videoconferencing, and prepaid calling cards. In its full-service markets, Electric Lightwave bundles its services to provide the convenience of one single bill and one number to call for service.

Electric Lightwave is expanding across the country and will initially offer data and Internet access services in its new markets. Currently, Electric Lightwave plans to launch these services in a dozen major markets across the country including Chicago, Atlanta, New York, and Boston by 1999.

Electric Lightwave currently serves 83 municipalities including major metropolitan areas such as San Francisco and Los Angeles. Currently, the company employs over 840 people and is headquartered in Vancouver, Wash.

Local Telephone
Basic Business Lines
PBX/Key Systems Trunks
Virtual Private Exchange
Centrex™
Foreign Exchange Services
Voice Messaging
Multi-Service Fractional T-1
Customer Premise Equipment
Fax Mail
ISDN PRI
OC-3 / OC-3C
CLASS™ Services
Wholesale LTS

Long Distance
Retail Switched 1+ Services
Retail Dedicated 1+ Services
Wholesale Termination
Conferencing
800 Services - Dedicated
800 Services - Switched
Prepaid Debit Cards
Travel Cards

Data and Video
Dedicated Internet Services
Frame Relay
International Frame Relay
Transparent LAN Service
Switched 56 KB
Dialable Wideband Service
Videoconferencing
ATM
Remote NETCONNECT™

Network Access
56 KB / 64 KB
DS-1DS-3
Disaster Recovery
Multiplexing
Collocation
OC-12
Diverse Routing
OC-3 / OC-3C

Corporate and Regional Offices:

Corporate Office
4400 77th Avenue
Vancouver, WA 98662
(360) 816-3000

Idaho
10452 West Emerald
Boise, ID 83704
(208) 376-2400

Arizona
1620 W. Fountainhead Pkwy
Suite 610
Tempe, AZ 85282
(602) 277-1122

Nevada
3753 Howard Hughes Prkwy
Suite 200
Las Vegas, NV 89109
(702) 836-8415

Los Angeles, California
5230 Pacific Concourse Dr.
Suite 200
Los Angeles, CA 90045
(310) 643-4564

Oregon
400 SW Sixth Avenue
Suite 500
Portland, OR 97204
(503) 972-8330

Sacramento, California
650 J Street
Sacramento, CA 95814
(916) 231-5700

Utah
4 Triad Center
Suite 200
Salt Lake City, UT 84180
(801) 924-3000

San Diego, California
4275 Executive Square
Suite 800
La Jolla, CA 92037
(619) 546-2997

Seattle, Washington
1218 Third Avenue
Suite 915
Seattle, WA 98101
(206) 812-2000

San Francisco, California
1750 Montgomery Street
San Francisco, CA 94111
(415) 773-5370

Spokane, Washington
510 West Riverside Avenue
Suite 101
Spokane, WA 99208
(509) 363-4500

Colorado
2605 S. Monroe
Denver, CO 80210
(303) 756-5665

Tacoma, Washington
1148 Broadway Plaza
Suite 104
Tacoma, WA 98402
(253) 428-4280

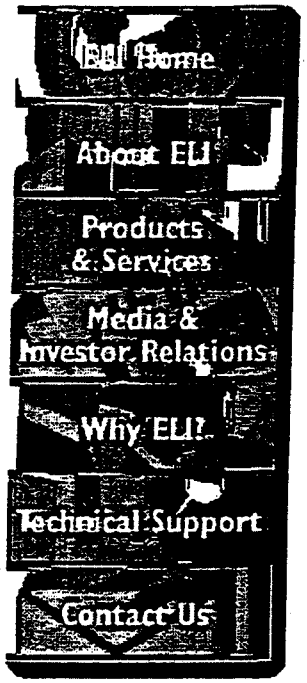
Company Contacts:

Media:
Jack Hardy
(360) 816-3602
jack_hardy@eli.net

Investor:
John Unverferth
(360) 816-3217
john_unverferth@eli.net

Products & !

NETWORK MARK | CUSTOMER CARE



YEAR 2000 STATEMENT

BUNDLED SERVICES

All Calls
Custom Link

DATA SERVICES

ATM NEW
Frame Relay
Internet Connections
ISDN / PRI
NetTrends
Remote NetConnect NEW
Transparent LAN

LOCAL TELEPHONE SERVICE

Basic Lines
Enhanced Business Services
PBX / Key System
Voice Messaging
Virtual Private Exchange

LONG DISTANCE SERVICE

Advantage Calling Card NEW
Conference Calling NEW
Long Distance

PREPAID SERVICES

Prepaid Services NEW

PRIVATE LINE SERVICES

Point - to - Point

VIDEOCONFERENCING

Videoconferencing

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< CUSTOMER CAR

NETWORK MAPS | CUSTOMER CARE

ELECTRIC LIGHTWAVE

SEARCH

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Products & Services
Media & Investor Relations
Why ELI?
Technical Support
Contact Us

Electric Lightwave, Inc.
Arizona Telecommunications Facts
April 1998

Arizona Sales Office
1620 W. Fountianhead Prwy
Suite 610
Tempe, AZ. 85282
(602) 277-1122

Arizona Branch Manager
Adam Schrage
(602) 277-1122
adam_schrage@eli.net

1993 - Electric Lightwave begins construction of a long haul transport network (Southwest Fibernet) connecting Phoenix and Las Vegas..

1994 - Electric Lightwave completes Southwest Fibernet, a 356 route mile long haul network.

June, 1995 - Competition Rules adopted by Arizona Corporate Commission. Electric Lightwave begins providing limited communications services.

February 8, 1996 - Congress passes the Telecom Act of 1996 allowing local telephone competition for the first time in nearly 100 years.

January 16, 1997 - ELI is granted intrastate authority from the Arizona Corporation Commission to provide intrastate telecommunications services in areas where US West is the incumbent local exchange carrier.

June 18, 1997 - At a ceremony at ELI's switching facility, ELI announced a strategic alliance with Salt River Project (SRP) to connect with SRP's existing 250-mile fiber optic network with ELI's extensive downtown-area network and provide business customers an option of choosing telecommunications services.

Benefits to the Community - The ELI/SRP strategic alliance will benefit the Murphy Elementary School District community with the school district's plans for "Creating Learning Communities On-Line." The program calls for children to learn their way around the Internet, e-mail and on-line tutorial software and use these skills to mentor older family members. Plans include the creation of a learning community environment that will benefit students and adult family members.

Phoenix Full-Service Switch Dedication - (Expected May 1998) Electric Lightwave plans to dedicate a state-of-the-art digital telephone switch, making both local and long distance service available Phoenix area businesses.

Products and Services in Arizona:

Electric Lightwave builds and operates all-digital,

fiber-optic networks over which it offers state-of-the-art voice and data communications services:

- Local telephone service with voice mail and enhanced features
- Long distance service with calling cards
- Advanced data service, including frame relay (domestic and internationally), high-speed -Internet access, ISDN, dialable wideband services and LAN to LAN (local area network) services with very high transport speeds.
- Videoconferencing
- Network access

Electric Lightwave interconnects its major hub cities and market clusters with facilities-based broadband, long-haul fiber-optic networks.

- Long-haul routes currently operational: between Portland and Seattle, Portland and Spokane and Las Vegas and Phoenix
- Long-haul routes under construction: between Portland and Eugene (first half of 1998); Portland to Boise to Salt Lake City to Las Vegas to Los Angeles (first half of 1999)

Electric Lightwave has an extensive Internet backbone that includes 18 frame relay switches and 30 points-of-presence in 26 western cities. NOTE: In a recent national survey by Boardwatch Magazine, ELI ranked third out of 39 companies for "Best Internet Value" (see http://www.boardwatch.com)

Industry Opportunity:
According to the Yankee Group, a Boston-based research firm, in 1997 the competitive local exchange business grew more than 50 percent to $3.1 billion

Company Contacts:

Media:
Jack Hardy
(360) 816-3602
jack_hardy@eli.net

Investors:
John Unverferth
(360) 816-3217
junverfe@eli.net

Arizona General Manager:
Adam Schrage
(602) 277-1122
adam_schrage@eli.net

World Wide Web site:
http://www.eli.net

Return To Top

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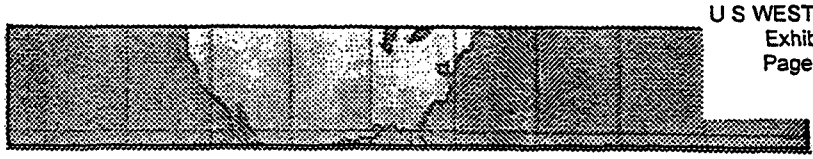
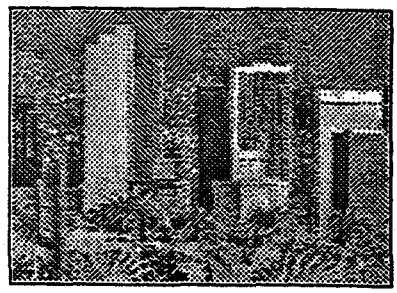


You are here: Home / Locations / Arizona.

GST IN ARIZONA

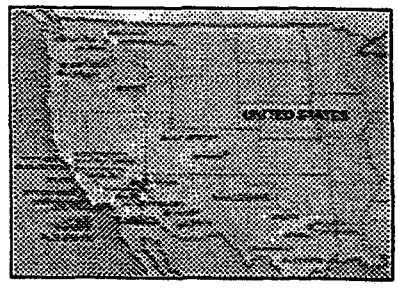
Phoenix:

Location: One Arizona Center
400 E Van Buren, Suite 350
Telephone: (602) 230-7608
Fax: (602) 230-7728



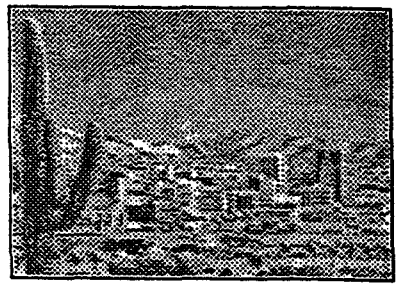
Mesa:

Location: 1201, S Alma School Rd., Suite 2000
Mesa, AZ 85210
Telephone: (602) 964-3888
Fax: (602) 898-1946



Tucson:

Sales Office: 4555 S Palo Verde Road, Suite 163
Tucson, AZ 85714
Switch Site: 3836 S. Evans Blvd.
Telephone: (520) 618-4200
Fax: (520) 618-420



Select a City or a State:

Arizona | Go To

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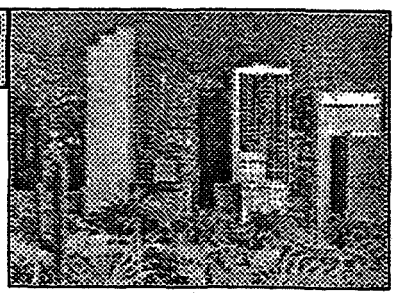
PHOENIX



Location: One Arizona Center
400 E Van Buren, Suite 350
Telephone: (602) 230-7608
Fax: (602) 230-7728

LOCATE OFFICE

Operational Date: February 1994
Investment: Approximately $ 11 Million
General Manager: Bill Bryant
Number of Employees: 18

Services Offered:

Local Dial Tone: Power Trunk, Analog, Business Lines, Centrex, Customer Local Area Signaling Services (CLASS) such as call forwarding, caller ID, voice mail and automatic call back.
Long Distance: IntraLATA and InterLATA, Inbound and Outbound, Long Distance services through dedicated and switched access.
Private Line Dedicated, Long Haul and special access services available for DS1, DS3, OC-3, OC-12, OC-48, IntraLATA, InterLATA
Collocation Services: Customers can physically locate their communications equipment at a GST site.
Carrier Services: Switched services for Carriers.

Internet: High Speed Access, Layered Service
Data Transport Services Frame Relay

GST first introduced service to businesses in the Phoenix area in 1994. Local dial tone service was inaugurated in the Fall of 1997.

Network Information: GST operates a 11-mile fiber optic network (1,290 fiber miles) throughout downtown Phoenix. Conduit and right-of-ways have been acquired for an additional 18 miles of expansion. The network is collocated with two US West central offices. Two switches are installed at the site - one voice switch (Nortel DMS 500) and one data switch (Cascade Frame Relay).
GST's operations in Phoenix and Tucson were linked via a 200-mile long haul fiber connection in November of 1997. GST is the first Competitive Local Exchange Carrier (CLEC) to link two existing networks within Arizona. From Phoenix, the network is linked to the Company's Los Angeles operation via a

Phoenix, the network is linked to the Company's Los Angeles operation via a long haul connection that passes through Las Vegas.
The Company's total investment in Arizona over the last four years tops $24 million. In March of 1998, GST acquired 100 percent of the outstanding capital stock of Call America Phoenix, solidifying its presence in the Phoenix market.

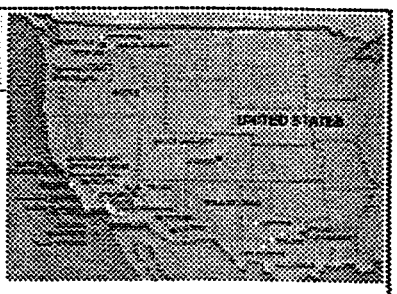
Regulatory Certifications: GST is authorized by the Federal Communications Commission and the Arizona Corporation Commission to provide resold and facilities-based telecommunications services.

Select a City or a State:

Arizona | Go To

You are here: Home / Locations / Mesa.

MESA



Location: 1201, S Alma School Rd., Suite 2000
Mesa, AZ 85210
Telephone: (602) 964-3888
Fax: (602) 898-1946

LOCATE OFFICE

Services Offered:

Local Dial Tone: Power Trunk, Analog, Business Lines, Centrex, Customer Local Area Signaling Services (CLASS) such as call forwarding, caller ID, voice mail and automatic call back.

Long Distance: IntraLATA and InterLATA, Inbound and Outbound, Long Distance Services through dedicated or switched access.
Private Line Dedicated, Long Haul and special access services available for DS1, DS3, OC-3, OC-12, IntraLATA, InterLATA
Collocation Services: Customers can physically locate their communications equipment at a GST site.

Internet: High Speed Access, Layered Service
Data Transport Services Frame Relay. DataLinx GlobalLAN Plus - (wide area network) Provides high bandwith connectivity between customer locations with LAN interfaces provided to customers. DataLinx Frame Relay is a public fast packet data service that efficiently handles multiple LAN protocols to support a wide variety of data applications.

Regulatory Certifications: GST is authorized by the Federal Communications Commission and the Arizona Corporation Commission to provide resold and facilities-based telecommunications services.

Select a City or a State:

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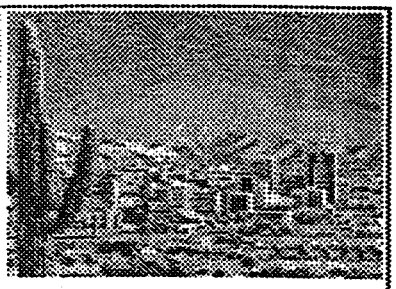
TUCSON



Sales Office: 4555 S Palo Verde Road, Suite 163
Tucson, AZ 85714
Switch Site: 3836 S. Evans Blvd.
Telephone: (520) 618-4200
FAX: (520) 618-420

LOCATE OFFICE

Operational Date: August 1995
Investment: $ 13 Million
General Manager: Bill Bryant
Number of Employees: 26

Services Offered:

Local Dial Tone: Power Trunk, Analog, Business Lines, Centrex, Product Bundling, Customer Local Area Signaling Services (CLASS) such as call forwarding, caller ID, voice mail and automatic call back.

Long Distance: IntraLATA and InterLATA, Inbound and Outbound, Long Distance Services through dedicated or switched access.
Private Line Dedicated, Long Haul, IntraLATA, InterLATA, Special Access for DS1, DS3, OC-3, OC-12, OC-48, Collocation at GST Hub.
Collocation Services: Customers can physically locate their communications equipment at a GST site.
Carrier Services: Switched services for Carriers

Internet: High Speed Access, Layered Service
Data Transport Services Frame Relay. DataLinx GlobalLAN Plus - (wide area network) Provides high bandwith connectivity between customer locations with LAN interfaces provided to customers. DataLinx Frame Relay is a public fast packet data service that efficiently handles multiple LAN protocols to support a wide variety of data applications.

GST first introduced service to businesses in the Tucson area in 1995. Local dial tone service was inaugurated in the Fall of 1997.

Network Information: GST operates a 41.6-mile fiber optic network (4,363 fiber miles) which currently serves downtown Tucson and the primary business corridors. The network is collocated with one US West central office. Two switches are installed at the site - one voice switch (Nortel DMS 500) and one data switch (Cascade Frame Relay). An additional 75-mile network will extend

throughout the Tucson metropolitan area. GST's operations in Tucson and Phoenix were linked via a 200-mile long haul fiber connection in November of 1997. GST is the first Competitive Local Exchange Carrier (CLEC) to link two existing networks within Arizona. From Phoenix, the network is linked to the Company's Los Angeles operation via a long haul connection that passes through Las Vegas.
The Company's total investment in Arizona is approximately $24 million.

Regulatory Certifications: GST is authorized by the Federal Communications Commission and the Arizona Corporation Commission to provide resold and facilities-based telecommunications services.

Select a City or a State:

Arizona Go To

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LOCAL TELEPHONE SERVICES

Basic Business Lines
Centrex Services
Analog Trunk
PowerTrunk
ISDN PRI
Enhanced Services

LONG DISTANCE SERVICES

Switched Services 1+
Dedicated Services 1+
Card Services

DATA TRANSPORT

Frame Relay
ATM

INTERNET SERVICES

High Speed Access
Dialup Access

NETWORK SERVICES

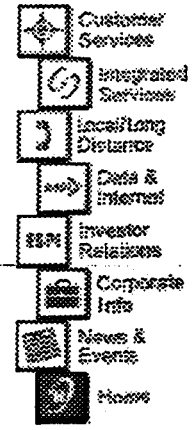
Point-to-point Transport
Operator Services
Collocation
Switched Services for Carriers

INTEGRATED SOLUTIONS

PowerFlex T1
Hospitality

Site

communications to the point.



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- Site Map
- Glossary
- Stock Ticker

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  - Local Phone
  - Long Distance
  - Special Access
  - Audio Conferencing
- Data Services
  - ATM
  - Frame Relay
  - Internet Access
  - Managed Internet
  - Managed Frame Relay
  - Security Services
  - Web Hosting
- Integrated Services
  - Integrated ISDN
  - Integrated Platinum

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- Management Team Bios

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- Analyst Coverage
- Annual Report 1997
- Annual Report 1996
- Investor Relations Kit & Mailing List Registration
- Press Releases
- 1998 10Q (3/98 - PDF)
- 1997 10K (PDF)
- 1997 10Q (6/97 - PDF)
- 1996 10K (PDF)

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- Tradeshow Schedule
- Internetworking Form
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- SuperComm '98 Post Show Survey

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- ValuPaK
- OfficeConX
- Platinum

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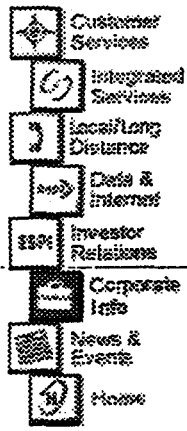
Network Loc



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- Contact
- Site Map
- Glossary
- Stock Ticker

TUCSON

NXX Lookup TUCSON Show NXX

espire's Tucson central business district network backbone, with six miles of state-of-the-art fiber optics, was activated in February, 1996. A network expansion of more than 73 miles was ready for service in May 1996. A third expansion of 29 miles was completed in October 1996. These combine to form the largest fiber optic ring in Tucson, 108 miles

Complete Network Services

- Local technicians available for on-site calls
- Your choice of interexchange carrier access
- Total dedicated access/advanced data solutions
- Fiber optic SONET quality, capacity, and security is unrivaled

Expansion

- 29 mile northwest expansion completed in October 1996; Northwest business corridor along Interstate 10
- 73 mile expansion completed in May 1996; eastward from downtown along Grant and Broadway south to Rita Road complex to serve potential customers like Keane, IBM, and Hughes; through the Airport Authority complex, serving Intuit, UPS, and Butterfield Business Park
- ATM backbone available
- Lucent 5ESS switch installation scheduled for second quarter 1997

Tucson Team.....

- espire's experienced team of professionals can help you develop the right communications solutions for your business

Email Tucson: Tucson Team

Lanny Gray, Branch Sales Manager

Tom Fallon, Senior Account Executive
Clark Phipps, Senior Account Executive
Deena Toal, Account Executive
Laura Chalk, Account Executive
Bruce Mindlin, Account Executive
Robin Kozakevich, Account Executive
Amanda Bayne, Administrative Assistant
Sue Tyriver, Account Consultant
Alma Wodecki, Account Consultant
Charlie Kondrat, Operations Manager
Mark Holbrook, Senior Technician
Mike Davied, Technician

Bob Cartwright, Technician
Owen Sullivan, Site Technician
John Carpenter, Regional Director of Operations
Frankie Holbrook, Regional Administrative Assistant
Scot Vrolyk, Regional Technical Consultant
Nancy Abrams, Regional Account Consultant

Bank of America Plaza
33 N. Stone Avenue, Suite 1200
Tucson, Arizona 85701
Tel: (520) 740-1800
Fax: (520) 740-1818

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MCI WorldCom - Vienna

8521 Leesburg Pike
Vienna, VA 22182
(703) 918-6000 , Fax (703) 918-6601
www.mci.com

☑ Headquarters ☐ Field Operation

- MAJOR OWNERS: MCI WorldCom
- LEGAL FORM: ☐ Public ☐ Private ☑ Subsidiary ☐ JV
- YEAR OPERATIONS BEGAN: 1990
- CEO: Gary M. Parsons
- COO: Nate A. Davis
- SERVICES OFFERED:

☑ Basic Residential	☑ Long Distance
☑ Basic Business	☑ Wireless
☑ Private Line	☑ Internet Access
☑ Complex Data	☑ Calling Card
☐ CATV	☐ Videoconferencing
☑ 800 Service	☐ DSL

- OPERATING UNITS:

MCI WorldCom - Boston
MCI WorldCom - Cincinnati *Planned*
MCI WorldCom - Detroit
MCI WorldCom - Ft. Lauderdale *Planned*
MCI WorldCom - Philadelphia
MCI WorldCom - Pittsburgh
MCI WorldCom - Raleigh *Under Construction*
MCI WorldCom - San Diego
MCI WorldCom - Denver
MCI WorldCom - Minneapolis *Under Construction*
MCI WorldCom - San Francisco
MCI WorldCom - Atlanta
MCI WorldCom - Baltimore
MCI WorldCom - Chicago
MCI WorldCom - Cleveland
MCI WorldCom - Dallas *Planned*
MCI WorldCom - Hartford
MCI WorldCom - Houston *Planned*
MCI WorldCom - Los Angeles
MCI WorldCom - Memphis *Under Construction*
MCI WorldCom - Miami
MCI WorldCom - Milwaukee
MCI WorldCom - New York City

MCI WorldCom - Newark *Under Construction*
MCI WorldCom - Orlando
MCI WorldCom - Phoenix *Under Construction*
MCI WorldCom - Portland
MCI WorldCom - San Antonio *Planned*
MCI WorldCom - Seattle
MCI WorldCom - Tampa
MCI WorldCom - Tulsa
MCI WorldCom - Washington D.C.

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MCI WorldCom On-Net Services sm

Product Vision

In today's increasingly complex communications environment, businesses of all types must deal with different companies and networks, disparate products and services, and multiple contacts and contracts. It's not only confusing and often chaotic, but draws critical focus away from key business activities.

Now, imagine this:
A single access method for all of your voice, data and Internet services The industry's most extensive portfolio of integrated products and services volume discounts across local-to-global services One point-of-contact for all of your voice and data services, wherever you do business.

This is the vision of MCI WorldCom sm - a vision that is now a reality with the introduction of MCI WorldCom On-Net Services.

Need More Information?

Residential Services
Small Business Services
Business Services

Voice Services

Local Service
Long Distance
Toll Free
Calling Card
Access
Enhanced Call Routing

Data Services

Internet Access Services
Internet Dial
Private Line
Frame Relay Service
Remote LAN Dial
Managed Services
International Private Line
Managed International Private Line
ATM
ISDN

Integrated Services

Paging
Conferencing
Customer Premises Equipment

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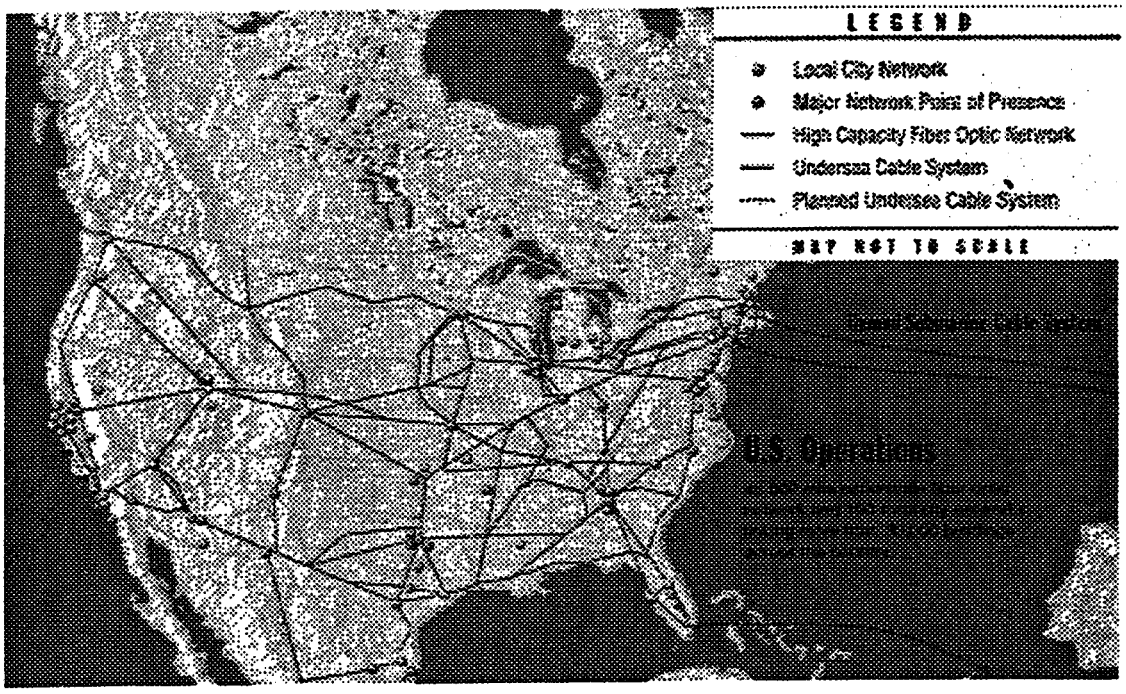
Corporate Overview



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[redacted]
Phoenix, Arizona 85015
[redacted]

TO: Sue Wyatt
Account Manager
US West Communications

FAX #: (602) 630-5317 No. of Pages: 1

FROM: [redacted]
Trust Accountant

DATE: October 28, 1998

It has been a pleasure working with you to improve our phone and data service and find a solution for the problems with our current phone service. With your direction, we have decided that the PRI service would best suit our needs.

As indicated in our meeting, we have been discussing the service with AT&T as well as MCI/Worldcom. Both companies will waive one-time charges if they provide the service.

I am requesting US West to waive their one-time charges, such as installation fees, for the PRI service so we can cost-effectively sign an agreement with you.

We are prepared to sign an agreement as soon as an answer is received to this request.

Thank you again for your assistance in helping us provide our clients the best possible service.

Cust needs 2 Pri - T1s + trunks

Mailing Address
[redacted] Phoenix, Arizona 85067-3487

February 27, 1998

[redacted]
Tucson, AZ 85712

Dear [redacted] -

Thank you for the opportunity to introduce WinStar GoodNet as your network solution for [redacted]

As you requested, I included a proposal for WinStar GoodNet to provide a frame Private Network involving Yuma, Phoenix, & Tucson locations. The pricing schedule below includes the local loop and data service charges. The Dedicated Dial up locations will be $25 per account with a $25 install fee.

WinStar GoodNet VPN Pricing per location

Port Speed	Monthly Recurring 1-Year Term	Monthly Recurring 3-Year Term	Monthly Recurring 5-Year Term
Yuma			
56Kbps	$200.00	$190.00	$180.00
Install Fee	$500.00	$500.00	$500.00
Phoenix			
384Kbps	$500.00	$480.00	$460.00
Install Fee	$630.00	$630.00	$630.00
Tucson			
384Kbps	$500.00	$480.00	$460.00
Install Fee	$630.00	$630.00	$630.00
GoodNet			
T1(1.54Mbps)	$1,300.00	$1,200.00	$1,000.00
Install Fee	$1000.00	$1,000.00	$1,000.00
Total Monthly Costs	$2,500.00	$2,350.00	$2,100.00
Total Install Fees	$2,760.00	$2,760.00	$2,760.00

Please review the information and I look forward to further discussing how this was received next week. If you need to reach me prior, please call 602-303-9500 x3113 or e-mail me at brockr@good.net.

Sincerely,

Brock Robertson
Regional Sales Manager

GoodNet

ELECTRIC LIGHTWAVE

Service Proposal: Technical Air Balance
Requested By: [redacted]
Service: 2 T-1 connections, 36 DSO:
Phone: [redacted]
Fax: [redacted]
Date: 6/19/98

[redacted]

I have prepared a quote for two T-1 circuits with 36 Two way trunks to your headquarters at [redacted] Phoenix, AZ.

	MONTHLY	NRC
Three Year Contract	$ 1,356.00 ($37.50 per line)	**$1,365.00
Five Year Contract	$ 1,272.00 ($35.30 per line)	**$ 1,365.00
Local Loop Charge	$ 308.50 (each T-1)	**$ 626.50(each T-1)

The NPA NXX numbers used in this price quote are 602[redacted] and 602[redacted]. The above prices is for each T-1 connection.

**Install costs are waived under current promotion if ordered by June 30th. Normal NRC charges are as shown above.

Please Note: Price Quotes are good for 30 days

If you have questions do not hesitate to contact me at 602.277.1122 Ext. 650.

Thank you for the opportunity to bid on this business, and I look forward to working with you.

Best Regards,

Richard E. Glissendorf
Account Executive
Electric Lightwave Inc.

NOTE: NRC = Non Recurring Charges

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. AFFIDAVIT OF KAREN A. STEWART
STATE OF OREGON	)	
COUNTY OF MULTNOMAH	)	
	) :)	SS

Karen A. Stewart, of lawful age being first duly sworn, deposes and states:

1. My name is Karen A. Stewart. I am Director, Markets-Regulatory Strategy of U S WEST Communications in Portland, Oregon.

2. Attached hereto and made a part hereof for all purposes is my testimony.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

OFFICIAL SEAL
JANICE KAY KERR
NOTARY PUBLIC-OREGON
COMMISSION NO. 046143
MY COMMISSION EXPIRES SEPT. 17, 1999

Karen A. Stewart
Karen A. Stewart

SUBSCRIBED AND SWORN to before me this 4th day of January 1999.

Janice Kay Kerr
Notary Public

My Commission Expires:
Sept. 17, 1999

EXHIBIT

Q-15

Admitted

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. _____

TESTIMONY OF

JERROLD L. THOMPSON

U S WEST COMMUNICATIONS

JANUARY 8,1999

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EXECUTIVE SUMMARY

Current Responsibilities:

My title is Executive Director- Service Cost Information. My responsibility includes the organization which provides information, including expert testimony, on the cost of service for all products and services that U S WEST offers, including its traditional retail services and the more contemporary wholesale services.

Purpose of Testimony:

My testimony presents and describes the Total Service Long Run Incremental Cost (TSLRIC) studies that have been filed in support of the price changes in this proceeding. My testimony provides an overview of the economic principles considered in the studies, and describes the cost calculation procedures followed in the studies.

Summary of Testimony:
My testimony is organized into four parts: (a) the principles of TSLRIC; (b) U S WEST's TSLRIC Study procedures; (c) descriptions of each study in attached exhibits; (d) comparison of TSLRIC and TELRIC principles.

Principles of TSLRIC. U S WEST's TSLRIC studies assume forward-looking technology (not what is actually used for current services). The studies are replacement cost studies, meaning that they calculate the cost of replacing the network used to provide service. U S WEST employs computer models that determine the asset costs of technology used to provide telecommunications service. These models compute the lowest, but realistic cost of service. The studies estimate a cost per unit of demand assuming demand at the existing level of service provided by U S WEST. The costs are identified in terms of Direct costs and Network Support costs. These costs are only the primary costs of service and do not address common costs of the firm which need to be recovered from the prices charged for service.

TSLRIC Study Procedures. My testimony describes the procedures used by U S WEST cost analysts to estimate recurring and non-recurring costs. Recurring costs are those that are ongoing, physical asset related, and last as long as the service is provided. Non-recurring costs are those that are one-time, usually incurred when service is established, and are primarily labor

related. The recurring cost procedures describe the process of obtaining cost data from engineers, vendors, price lists of material, etc.. The non-recurring cost procedures describe the process of obtaining work times for order taking and installation. They also include the probabilities that each task will occur. Both recurring and non-recurring cost studies are validated with other data sources.

U S WEST TSLRIC Studies. In the Exhibits to my testimony I provide detailed descriptions of each study for the purpose, scope and application of the study, description of the service, the methodology, the models used, and the key assumptions used.

TSLRIC vs. TELRIC. I compare and contrast the principles used in both of these type of cost analyses. Although many of the principles are the same or similar I point out that the application and objectives of the two study types are very different. Whereas Total Element Long Run Incremental Cost (TELRIC) studies estimate the costs of unbundled network elements that are used to provide service, Total Service Long Run Incremental Cost (TSLRIC) studies estimate the cost of providing a service that a customer receives. TELRIC studies have been used by Commissions, such as the Arizona Corporation Commission, to set the prices charged to Competing Local Carriers to enable competition in the local market. In these situations, TELRIC equals the wholesale price. TSLRIC studies are used to determine the lowest cost to provide a single service and therefore are useful in determining the price floor of a service. For retail services, TSLRIC does not equal the price charged to customers. Because TSLRIC represents the forward-looking *theoretical* cost of providing service, the aggregation of TSLRIC would not equate to the overall revenue requirement as established in rate case proceedings. Therefore, the only use of TSLRIC is to establish floors below which prices should not be set, so that competitors have the ability to enter the market fairly.

Conclusion and Recommendation. The Commission should approve the use of U S WEST's TSLRIC studies as the appropriate price floor for the services in this proceeding

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Jerrold L. Thompson. I am employed by U S WEST, Inc., (U S WEST) as Executive Director - Service Cost Information. My business address is Room 4400, 1801 California Street, Denver, CO.

Q. PLEASE REVIEW YOUR EDUCATION, WORK EXPERIENCE AND PRESENT RESPONSIBILITIES.

A. My accounting experience includes about 25 years of work in education, public accounting and in private industry. I have been employed in telecommunications for close to 20 of those years. The majority of my experience is in the area of cost accounting in telecommunications. I have experience in telephone cost accounting as it relates to independent telephone companies and with U S WEST. For several years I supervised the development and filing of many financial reports and cost studies that supported U S WEST's submissions before the 14 state jurisdictions of U S WEST and the FCC, including the reports known as the Automated Report Management Information System (ARMIS). I have provided expert accounting testimony in many proceedings in the majority of U S WEST's serving territory over the last 15 years. I have Master degrees in Business Administration and Taxation. I am a Certified Public Accountant licensed in Colorado and New Mexico. I belong to the American Institute of Certified Public Accountants, and the Arizona, Colorado and New Mexico state CPA societies.

My responsibility includes the organization which provides information, including expert testimony, on the cost of service for all products and services that U S WEST offers, including its traditional retail services and the more contemporary wholesale services.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I have provided testimony in Dockets: E-1051-86-018, E-1051-93-183, E-1051-93-189, E-1051-95-143, and U-3021-96-448/3245-96-448 ET AL. In addition, I have provided testimony in numerous proceedings in Colorado, Idaho, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Utah, and Wyoming.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony presents and describes the Total Service Long Run Incremental Cost (TSLRIC) studies that have been filed in support of the price changes in this proceeding.

My testimony provides an overview of the economic principles considered in the studies, and describes the cost calculation procedures followed in the studies.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. My testimony is organized into four major sections. First, I describe the cost principles used in the studies. Second, I describe the procedures that U S WEST used in the studies. Third, I describe the specific studies filed in this proceeding. Finally, I discuss the differences between TSLRIC and TELRIC studies.

TSLRIC PRINCIPLES

Q. PLEASE SUMMARIZE THE ECONOMIC PRINCIPLES THAT ARE APPLIED IN U S WEST'S TSLRIC STUDIES.

A. U S WEST's Total Service Long Run Incremental Cost (TSLRIC) studies identify the *forward looking, long run* incremental costs that are *directly caused* by offering a service or group of services. The description used in U S WEST's cost studies for TSLRIC is *Total Direct.* The assumptions, methods, and procedures used in U S WEST cost studies are designed to yield the long run forward-looking *replacement* costs of reproducing the telecommunications network, considering the most efficient *least cost* technologies that are currently available.

Q. IS IT IMPORTANT THAT TSLRIC STUDIES CONTAIN REALISTIC FORWARD-LOOKING ASSUMPTIONS?

A. Yes. A properly constructed TSLRIC study identifies the forward-looking costs that are likely to be incurred in the future, based on the latest available technologies and methods of operations.

Therefore, the U S WEST studies focus on the least cost forward-looking technologies that are currently available to U S WEST. Only commercially available and tested technologies currently being used in the industry are considered. Theoretical future technologies are not considered in the U S WEST studies, since it is impossible to know how much such theoretical technologies will cost and how they will be configured—if in fact they are ever commercially available.

Q. IS THE MOST EFFICIENT LEAST COST TECHNOLOGY ALWAYS THE LATEST STATE-OF-THE-ART TECHNOLOGY?

A. No. Least cost technology is not necessarily the most recent "state of the art" technology—least cost technology is the technology that will provide the service in the most efficient manner, resulting in a *least cost* estimate.

Q. CAN YOU PROVIDE SOME EXAMPLES OF HOW APPROPRIATE FORWARD-LOOKING TECHNOLOGIES ARE CONSIDERED IN U S WEST'S TSLRIC STUDIES?

A. Yes. In the development of investment costs, U S WEST models forward-looking least cost network designs. For example, U S WEST's loop (RLCAP) model considers the least cost forward-looking mix of copper, fiber and integrated pair gain equipment. Thus, the RLCAP model considers not just "state-of-the-art" technology (e.g., fiber) but also the "least-cost" way of providing the element in a given network application. For basic exchange service, copper facilities represent the least cost technology for shorter loops, while fiber and electronics represent the least cost technology for longer loops.

The Switching Cost Model (SCM) develops switching investment for each service, and considers only digital switch technology. Older less efficient technologies, such as analog switching

equipment, are not considered. In the Transport Module (TM), interoffice facilities are modeled assuming 100% fiber and SONET based equipment. The Signaling Model considers the forward-looking equipment in a Signaling System 7 (SS7) network.

The U S WEST TSLRIC studies also consider forward-looking operating expenses. U S WEST trends and adjusts its historical information to develop annual cost factors that estimate forward-looking costs. While using historical information as a starting point, U S WEST adjusts and trends its expense factors to account for future efficiencies, expected inflationary/deflationary price impacts and extraordinary events.

Q. WHAT DEMAND ASSUMPTION IS USED FOR TSLRIC STUDIES?

A. A TSLRIC study considers a forward-looking network that is designed to accommodate current levels of demand for all services and basic network functions. The U S WEST TSLRIC studies are consistent with this assumption, and consider the costs of a network that is "built from scratch," assuming current switch locations, to serve all current and anticipated demand. These studies identify total "replacement" costs, rather than the costs of adding equipment to an existing network to meet a small increment in demand. Thus, the studies consider the efficiencies associated with building a network to serve total demand.

Therefore, TSLRIC studies consider the total demand for the service, rather than a small increment in demand. The U S WEST studies consider the average cost for all units of demand, rather than the marginal cost of the next or last unit of demand. The TSLRIC studies identify the total cost of offering the service—defined as the total costs incurred by U S WEST while offering the service, less the total costs that would be incurred by U S WEST if the service were not

offered. In the U S WEST studies, the total service costs are unitized, and stated as an average cost per unit.

Q. DO THE COST STUDIES IDENTIFY DIFFERENT TYPES OF COSTS?

A. Yes. The U S WEST cost studies identify the total long run incremental costs directly associated with the service (i.e., TSLRIC). These are the costs that would be eliminated if the service were not offered, and include *volume sensitive* costs (i.e., costs that vary with the volume of a service) and *service specific fixed* costs (i.e., costs that are caused by the service, but do not vary with volume).

The TSLRIC includes the costs associated with the investment needed to provide the service (e.g., depreciation, maintenance) plus other expenses associated with offering the service (e.g., product management, sales expense, etc.) U S WEST's cost studies normally show TSLRIC on a unitized basis, which is simply the total service long run incremental cost divided by the total number of units of the service.

The studies also identify *Network Support* costs associated with the provision of a group of services. Network support costs are network administration and engineering costs that vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. The U S WEST cost studies also display Network Support costs on a unitized basis.

Finally, the cost studies display the sum of the Total Direct (TSLRIC) and the Network Support costs (Shared Costs).

Q. DOES U S WEST INCUR OTHER COSTS ABOVE AND BEYOND THE DIRECT AND NETWORK SUPPORT COSTS?

A. Yes. U S WEST also incurs *common overhead* costs. Common overhead costs are the costs a firm incurs as a result of doing business that are not associated with a specific service or a specific group of services. These costs represent a significant expense to the corporation. Examples of common overhead costs include executive compensation and planning expense, cost for accounting, finance, public policy, human resources and legal organization, and general and administrative expenses not directly related to services or groups of services. Common costs are not included in the U S WEST TSLRIC studies, but nonetheless represent real costs that must be recovered in prices, (sometimes referred to as *contribution to common cost*).

Q. DO THE U S WEST STUDIES FOLLOW THE PRINCIPLE OF COST CAUSATION?

A. Yes, the U S WEST TSLRIC studies follow the principle of cost causation. If a service causes an investment to be made, or an expense to be incurred, these costs are included in the study for the service. When investments (e.g., switching) are utilized by more than one service (e.g., basic exchange service, message telecommunications service, switched access), the investment costs are assigned to each service based on the consumption (usage) of the investment by the given service.

Q. HOW SHOULD TSLRIC DATA BE USED?

A. The information provided in the U S WEST TSLRIC studies should be used as one input in the pricing process. The economic costs that I am sponsoring provide cross-subsidy price floor information for each service (and group of services). However, these costs do not define the

appropriate price level—market demand and other factors should also be considered in determining the actual price.

Studies are useful in determining whether the direct revenues associated with a service cover the direct forward-looking costs associated with the service. That is, the revenues for a service should cover the TSLRIC to avoid cross-subsidies. Therefore, if the price of a service exceeds the TSLRIC of the service, stated as a cost per unit, the service passes the subsidy test.

While the TSLRIC may be useful in determining whether the direct revenues from a service cover the direct costs, TSLRIC by itself does not provide any information as to whether the service covers its proportionate share of shared costs (network support), which may be substantial.

The unitized Total Direct and Network Support costs identified in the studies provide one practical and useful barometer for product managers and regulators to use in evaluating whether a cross subsidy exists for a group of services. If the price for a service is set greater than its unitized Direct and Network Support costs, the service is priced to cover its directs costs and a proportionate amount of shared costs. Setting a price to cover these two costs would help to assure that a cross-subsidy would not occur at the service group level.

The pricing of services must also consider common overhead costs. U S WEST must price its services to recover the common overhead costs in addition to its Total Direct and Network Support costs to remain a healthy, viable and growing corporation that can continue to invest in new products and services. If the firm can not receive contribution from products to help recover these overhead costs, the products are not likely to be offered by the firm.

U S WEST TSLRIC STUDY PROCEDURES

Q. WHAT PROCEDURES DOES U S WEST USE TO IDENTIFY ITS TOTAL SERVICE LONG RUN INCREMENTAL COSTS?

A. Although each study is performed separately, the U S WEST TSLRIC studies all utilize a common approach in the calculation of results. The majority of costs can be described as recurring or non-recurring, but some fall into the category of transaction costs that occur as transactions are made. Examples of these costs occur with Directory Assistance, Message Toll, Switched Access, and Operator services. In this section of my testimony, I describe the methods used to calculate recurring and non-recurring costs because they represent the majority of the costs U S WEST incurs.

Q. PLEASE DEFINE RECURRING COSTS.

A. Recurring costs are the ongoing costs associated with providing a service. Recurring costs are generally physical asset or "investment-related", and include both capital costs and operating expenses. These costs are often presented as a cost per month or per unit of usage (e.g., per minute of use, or per call), and are incurred throughout the time period the service is provided to a customer.

Q. PLEASE DEFINE NON-RECURRING COSTS.

A. Non-recurring costs are the one-time costs that are incurred at the time a customer establishes, disconnects or changes service. These costs normally result from a customer service order, and are predominantly labor-related.

A. Recurring Cost Procedures

Q. PLEASE SUMMARIZE THE PROCEDURES USED TO CALCULATE RECURRING COSTS.

A. U S WEST cost models all employ the same basic procedures to arrive at monthly recurring Total Direct and Network Support cost estimates. The basic steps of performing a study are as follows:

1. **Define the Service.** The cost analyst works with product management and technical staff to define the service to be studied. This step includes identification of all the network components that are needed to provide the service, and an estimation of demand for the service.

2. **Development of Investment.** The investment required to provide the service is estimated, either based on a special study or using investment models (which I will discuss below), utilizing the forward-looking cost principles discussed above. The investment includes the actual vendor prices for material and equipment, plus the cost to place the equipment, including capitalized labor costs. Determination of the correct amount of investment is key to the accuracy of the cost study. Therefore, in addition to utilizing actual vendor material information and contractor or internal placement cost, U S WEST relies on sound forward-looking engineering practices to model the amount of investment needed to provide a given service at a particular level of usage or demand.

When appropriate, investment loading factors are used. For example, investment in land and buildings is identified via the application of an investment loading factor to central office equipment investment.

3. **Estimation of Investment-related Capital Costs.** Investment-related capital costs (depreciation, cost of money, income tax) are calculated based on the application of annual cost factors to the investment. Capital cost comprises a large portion of total service cost, and the level of capital cost is impacted by the depreciation lives for the relevant plant accounts and the weighted cost of debt and equity capital that is used.

4. **Estimation of Operating Costs.** Operating expenses are estimated, in most cases utilizing annual cost factors. Investment-related operating expenses (i.e., maintenance expense) are calculated based on annual cost factors that are applied to investment, while other operating expenses (e.g., marketing expenses) are normally calculated based on factors that are applied to the investment-related costs. These direct operating expenses are added to the capital costs to provide the Total Direct cost for the service.

5. **Validation of Results.** After costs have been estimated, this data is reviewed and compared with other cost data, to assure reasonableness. Results are compared across states and across services to check for reasonableness. In addition, forward-looking loop investment data is compared with actual recent construction expenditures.

Q. HOW DOES THE COST ANALYST OBTAIN THE VARIOUS INPUTS FOR THE STUDY?

A. On a day-to-day basis, as a cost analyst is completing a study, he or she works closely with a broad spectrum of resources and personnel within U S WEST, and external to U S WEST. A cost analyst collects data and analyzes all the resources U S WEST uses to provide a service or group of services—a function that is considered critical to the success of the product team.

The cost analysts work with product managers to develop service descriptions and to evaluate proposed methods of operation. They work closely with the engineers that design the service to identify component parts for the service, and to determine engineering capacity. Cost analysts work with depreciation specialists to determine the economic life of the equipment, with billing personnel to identify the billing requirements, and with product managers and demand and forecasting analysts to estimate demand. They also work with U S WEST purchasing personnel and vendors to determine prices charged to U S WEST, and of course, the cost analysts work closely with other analysts and managers within the cost organization.

B. Non-recurring Cost Procedures

Q. PLEASE SUMMARIZE THE GENERAL PROCEDURES USED BY U S WEST TO CALCULATE NON-RECURRING COSTS.

A. U S WEST follows six steps to produce non-recurring costs:

1. The cost analyst, working with a product team, identifies the activities necessary to establish a particular service or network element for a customer, e.g. installation of a telephone line.

2. Based on special studies and input from subject matter experts, the cost analyst estimates the work time, and probability of occurrence associated with each of these non-recurring activities. For example, the cost analyst evaluates U S WEST business office processes to detail the time needed for service representatives to take particular types of service orders.

3. The cost analyst calculates the expenses for each activity by multiplying the time required for each non-recurring activity by the appropriate labor rate.

4. The total costs for each separate activity are aggregated into a subtotal.

5. The subtotal is loaded with certain additional costs (e.g., product management) to produce a cost estimate.

6. The costs for each service are validated to assure reasonableness. These validations include comparisons with non-recurring estimates for similar U S WEST provided services, and comparisons with competitor estimates to the extent that is possible. Input time and labor estimates are validated across service and element offerings to assure consistent application.

Q. PLEASE IDENTIFY SOME OF THE MAJOR WORK ACTIVITIES THAT ARE INCLUDED IN NON-RECURRING COST STUDIES.

A. A non-recurring cost study includes the costs of activities associated with a customer's request for service. These activities include: order negotiation and preparation, plant assignment, circuit design, installation, testing, and order completion.

U S WEST'S TSLRIC STUDIES

Q. IN THIS PROCEEDING, IS U S WEST PROVIDING TSLRIC STUDIES FOR ALL COMPETITIVE AND NON-COMPETITIVE SERVICES?

A. No, in this proceeding I am sponsoring recurring and non-recurring costs for services for which the Company proposes to change prices or make other changes. The proprietary TSLRIC studies are available separately, along with the supporting workpapers for those parties signing

proprietary agreements. Exhibits JLT-1 through JLT-26 provide non-proprietary descriptions of each cost study. Proprietary Exhibit JLT-27 is a summary of the results of these studies.

Q. WHICH STUDIES HAVE BEEN INCLUDED IN THIS PROCEEDING?

A. The studies are identified in the Index of Exhibits attached to this testimony.

TSLRIC vs. TELRIC

Q. SINCE THE LAST U S WEST RATE CASE, THE COMMISSION HAS SEEN CONSIDERABLE DETAIL REGARDING U S WEST'S COSTS FOR UNBUNDLED NETWORK ELEMENTS AND THE USE OF TELRIC STUDIES. DO TSLRIC AND TELRIC STUDIES FOLLOW THE SAME ECONOMIC PRINCIPLES?

A. In general, yes. While a Total Element Long Run Incremental Cost (TELRIC) study identifies the cost of a *network element*, and a TSLRIC study identifies the costs associated with a *service*, both studies follow the same overall economic cost principles. Both TSLRIC and TELRIC studies identify the *forward-looking* costs associated with the provision of a UNE or service in the *long run*. These studies identify *total cost* of the UNE or service, i.e., the average incremental cost of providing the entire quantity of the element or service. The assumptions, methods, and procedures used in U S WEST TSLRIC and TELRIC studies are designed to yield the forward-looking *replacement* costs of reproducing the telecommunications network, considering the most efficient *least cost* technologies that are currently available.

Q. ARE THERE DIFFERENCES BETWEEN TSLRIC AND TELRIC STUDIES?

A. Yes. While TSLRIC and TELRIC studies have the same economic underpinnings, there are some methodological differences between the studies.

Q. PLEASE SUMMARIZE THE MAJOR DIFFERENCE BETWEEN A TSLRIC AND A TELRIC STUDY.

A. As I noted earlier, TELRIC studies by definition capture the costs associated with unbundled network elements while TSLRIC studies capture the costs associated with finished services, (such as Residence Flat Rated, Business Flat Rated, etc.). The major methodology difference between the two types of studies relates to how certain costs are categorized. TSLRIC studies separately identify Total Direct and Network Support costs.

Conversely, TELRIC studies seek to assign a greater portion of costs directly to a network element, per the FCC's methodology. The FCC's TELRIC methodology explicitly calls for costs that are shared among services (TSLRIC) to be considered direct or *attributed* costs for a network element (TELRIC). In addition, TELRIC studies include a small percentage for common costs in the total estimate. U S WEST includes direct costs for a single service, direct costs shared among services, but does not include common costs in its TSLRIC studies.

Q. GIVEN THE METHODOLOGY DIFFERENCES THAT YOU HAVE DESCRIBED, DO U S WEST'S TSLRIC AND TELRIC COST STUDIES USE SIMILAR INPUTS?

A. Yes. The studies use the same investment data, capital cost factor formulas, maintenance factors, and other direct factors. The remaining costs assigned (with the exception of marketing, advertising, and product-specific costs) are the same, but are included in separate factors.

However, U S WEST has not incorporated the Commission's TELRIC decisions (Decision No. 60635, Docket No. U-3021-94-448 ET AL) in the development of its TSLRIC studies because there are fundamental differences in application of TSLRIC studies versus the application of TELRIC studies.

Q. WHAT ARE THE FUNDAMENTAL DIFFERENCES IN APPLICATION OF TSLRIC AND TELRIC STUDIES?

A. The Commission approved rules governing interconnection prices and costs, (A.A.C. R14-2-1301 through R14-2-1311). The Commission further determined how to implement those rules in Decision No. 60635. Finally, the Commission found that TELRIC principles were to be used to set the prices for unbundled network elements (UNEs) so that the cost of a UNE equaled the price charged for the UNE.

In contrast, the prices of retail services need to be set in a rate case proceeding so that, in aggregate, the prices of the retail services will provide U S WEST a reasonable opportunity to recover its fair value rate base rate-of-return found to be reasonable by the Commission. If the price of retail services were to be set equal to the forward-looking TSLRIC of the services, U S WEST would not be given this opportunity to earn a fair return because the prices would not reasonably approximate the revenue requirement.

In Docket No. U-3021-96-418 ET AL, the Commission arbitrated and resolved conflicting proposals regarding the appropriate costs for U S WEST to charge to provide unbundled network elements to competing carriers. That type of proceeding was appropriate and consistent with Section 252(d)(1)(A)(i) of the Telecommunications Act of 1996. In this proceeding the Commission will determine just and reasonable rates that allow U S WEST a reasonable opportunity to earn a fair

return on its fair value rate base. These two proceedings are separate and distinct, and their objectives are not the same. The inputs and assumptions that are used by U S WEST in its TSLRIC studies are those that it believes properly reflect forward-looking costs to be used in this proceeding.

Q. WOULD YOU PLEASE CLARIFY THE PURPOSE OF THE TSLRIC STUDIES?

A. The purpose of TSLRIC studies is to provide information to be used as a price floor for retail services. My earlier testimony discussed the use of TSLRIC to avoid cross-subsidies. Said a different way, in a competitive environment, if one competitor were to price its services below TSLRIC, other providers would find it difficult to compete. Therefore, the TSLRIC of the services provides the minimum level that prices should be set in a competitive market. At a TSLRIC level many costs are still not recovered in the price, (i.e., the forward-looking shared and common costs, as well as the historical costs are not included in TSLRIC). Retail prices should be set so that TSLRIC costs are recovered, as well as shared costs and contributions to common costs, so that there is a reasonable opportunity for U S WEST to earn a fair rate of return.

CONCLUSION AND RECOMMENDATION

Q. WHAT IS YOUR RECOMMENDATION TO THE COMMISSION?

A. The Commission should approve the use of U S WEST's TSLRIC studies as the appropriate price floor for the services in this proceeding.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	))))))))))	DOCKET NO. _____

EXHIBITS OF

JERROLD L. THOMPSON

U S WEST COMMUNICATIONS

JANUARY 8, 1999

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RESIDENCE AND BUSINESS BASIC EXCHANGE SERVICE COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

1. RECURRING

The purpose of this study is to estimate U S WEST's 1998 **recurring** long-run incremental costs to provide customers with basic exchange services on the telecommunications network. This study includes local access (access line) and usage costs for basic one party flat and measured Residence, Business, and PBX Trunk services in the State of Arizona.

Long run incremental costs are developed in this study. Costs are calculated for the following scenarios: (1) State Wide Average, (2) Inside The Base Rate Area, (3) Outside The Base Rate Area – Zone 1, and (4). Outside The Base Rate Area – Zone 2. Costs are stated on a per line basis.

In this study the incremental costs of access lines are added to local usage costs for basic exchange residential and business services. Examples of these services are, but not limited to Individual Flat Rate Residence, Individual Flat Rate Business, and PBX Trunk.

2. NONRECURRING

This part of the study estimates U S WEST's **nonrecurring** long run incremental costs to provide basic exchange services for Residence and Business Telephone Services. The study results represent 1998 costs.

The study is forward looking and reflects the changing technologies and mechanization in the provisioning of Basic Exchange Residence and Business Services. It represents the estimated one-time (Nonrecurring) costs to install and disconnect service.

B. DESCRIPTION OF SERVICE

1. RECURRING

The following defines the components of the basic exchange service:

The **access line** is defined as all the non-traffic sensitive plant facilities and operating expenses associated with the customer's basic telephone service. That is to say, those costs that do not vary with the amount or type of usage. Access lines include the subscriber loop facility, drop (service wire) facility, and the non-traffic sensitive portion of the central office (NTS COE). In addition to those physical parts, the access line also includes costs associated with the maintenance of the basic number listing database for the telephone directory, and the billing and collection costs for the basic customer monthly bill.

The **subscriber loop** is composed of those outside plant and circuit facilities extending from the central office switch to and including the customer serving terminal. The cost of the loop does not include any inter-office trunk (wire center to wire center) facilities. Inter-office facilities are considered part of the traffic sensitive (usage) costs.

For certain customers, the loop includes building cable up to and including the main building terminal in addition to the other traditional construction types (fiber optic & copper underground, buried and aerial cable). Included in the costs for the outside plant loop facilities are the cables, associated supporting structures (underground conduit, manholes, and poles), cable terminals, air drying equipment and other non-mechanical signal modifying and enhancing devices for both fiber optic and copper loops. The loop includes the circuit equipment terminals, repeaters, and channel plugs associated with pair gain devices.

The **Drop or service wire** includes the cost of wire facilities between the customer's serving outside plant terminal and the customer's service location. A station protector or network interface is also included in the cost of the drop facility. Drop wires may be aerial or buried.

The non-traffic sensitive portion of the central office (**NTS COE**) costs include equipment for the main distributing frame (MDF) and MDF protectors, line cards, office alarms, and power distribution frames. This equipment is sensitive to the number of lines served by the central office, but not to the amount of traffic (usage) going through the office. Therefore, the cost of the equipment is associated with the incremental cost of exchange access lines, not the incremental usage costs of a particular switched service.

The basic exchange service customer receives a **listing** in the white pages directory as well as a listing in the directory assistance database. The cost associated with providing this listing is included in this study for basic exchange services.

The Billing & Collection cost included in the basic exchange services cost study covers the recurring incremental billing and collection costs associated with the preparation, rendering, and collection of Customer Record Information System (CRIS) bills.

Costs for **local exchange usage** are included in the Basic Exchange Services cost study.
Local exchange usage provides two-way telephone communications between end users within the same local calling area via the local public switched network. The communication path for this service extends from the serving wire center where the call originates to the serving wire center where the call terminates.

Local exchange usage includes the costs for the following elements:

a. Usage sensitive end office switching in both the originating and terminating end offices.

b. Usage sensitive tandem switching.

c. Usage sensitive interoffice facilities and terminations between the originating and terminating end offices.

d. Measurement equipment located in the originating end office and measurement teleprocessing equipment required to transport the measurement data to an accounting center.

e. Operator assistance providing operator support for local calling including dialing instructions and connection to directory assistance.

f. Local intercept service including limited mechanical announcements informing callers of line status.

g. Preparation, issuance and collection of bills for measured local exchange service on a per call basis. This also includes business office costs incurred during customer billing inquiries.

2. NONRECURRING

Nonrecurring costs represent the one-time charges that apply for specific work activities. This study estimates the nonrecurring charges that apply for ordering the Business or Residence Access facility needed to provide this service.

C. STUDY METHODOLOGY

1. RECURRING

Recurring Basic Exchange costs by service are developed by first accumulating the various investments for separate cost components and combining them with other miscellaneous inputs to calculate an investment for each component. These components include: Loop and Drop, NTS-COE, Billing and Collections, Directory Listing, and Local Usage. After investments are identified by component, the components are combined to yield investments by product or service type.

The study work papers, which are identified as Tab C within the study binder, include a series of spread sheets which can be identified as Excel files AZRES4 and AZBUS4. The investments are developed within these two separate Excel files: AZRES4 includes the investments for residence products, AZBUS4.XLS includes the investments for business services. Following is a summary of the different sections of these investment files:

I. INPUTS: The inputs section includes the following investments and other miscellaneous data:

A. The name of the state studied and dates of model runs used to identify investments.

B. Loop investments by account code and by rate area or zone.

C. Switching Unit Investments by account code. The investments are acquired from the Switched Usage Model (SUM). The SUM model calculates the investments associated with switching and measuring calls in the end office and tandem switches.

D. Transport Unit Investments by account code. These investments are acquired from the Transport Model (TM). The TM calculates investments associated with transporting calls over the USWC interoffice network.

E. Call Rates, Call Durations, and the list of specific products studied.

F. Usage Assumptions and state specific miscellaneous data is also inputted into this section. This data includes the following:

(1). The number of end offices required for intraoffice and interoffice calls, as well as the number of measurement offices required for measured calls.

(2). Percentages used to identify intraoffice versus interoffice calling characteristics, as well as the percent of local calls through a tandem office.

(3). The average transport distance, in miles, relative to an interoffice call is inputted into this section as well as non-traffic sensitive investments to calculate NTSCOE costs.

(4). Other investments and direct expenses including:
Billing and Collections, Directory Listings, Intercept, Measurement Polling, and Operator Assistance.

I. SWITCHING: End office switching, measurement, and tandem switching investments and expenses are calculated by account and as set-up and per conversation minute investments within this section. The program identifies the number of end offices required for an interoffice call, an intraoffice call, and the number of measurement offices required for a measured call. Set-up and conversation minute investments acquired from the inputs are multiplied by the appropriate required end office factor, (i.e.: 1 or 2). End office investments for intraoffice local calling and end office investments for interoffice local calling are then weighted together using percentages of local intraoffice traffic and percentages of local interoffice traffic within the state as weighting percentages. The result is a total weighted end office investment. Tandem investments appropriate to local calling are determined by multiplying total unit tandem investments by a percent of all local traffic through a tandem switch.

II. TRANSPORT: A conversion of Transport Model investments output to investments appropriate for local exchange service occurs within this section. Both interoffice facility and termination investments are calculated. Facility investment is calculated by acquiring the set-up and conversation minute investment by account from the Transport Model. The investment is then multiplied by an average distance, in miles, of a local call

to acquire a unit investment per call set-up and per conversation minute. The results are then multiplied by a percent of local calls that are interoffice to arrive at a weighted facility investment per call set-up and per conversation minute. Termination investment is calculated by acquiring unit investment per call set-up and conversation minute from the Transport Model. These values are multiplied by a percent of local calls that are interoffice to arrive at a weighted termination investment per call set-up and per conversation minute. The resulting weighted cost is then multiplied by 1+the percent of local interoffice traffic through a tandem. This latter calculation is completed to add in the termination investment relative to local interoffice calling through a tandem. The final result is a weighted termination investment per call set-up and per conversation minute.

III. SET-UP AND CONVERSATION MINUTE USAGE INVESTMENTS

Investments and direct expenses calculated in Section II and III are combined with operator assistance, LMS billing and collection, intercept, and measurement polling investments and expenses to yield the following set-up and conversation minute cost components:

1. Measured Residence Usage – Set-up
2. Measured Residence Usage – Conversation Minute
3. Business Measured Usage – Set-up
4. Business Measured Usage – Conversation Minute
5. Flat Rate Business and Residence Usage – Set-up
6. Flat Rate Business and Residence Usage – Conversation Minute

I. USAGE INVESTMENTS AND EXPENSES BY SERVICE TYPE

The appropriate set-up and conversation minute usage investments developed in Section IV are then combined with monthly per line call rates and call durations to calculate monthly per line local usage investments for each service being studied. Call rates and call durations used in this development are provided by a separate Subscriber Line Usage Study (SLUS).

II. SUMMARY BY SERVICE TYPE

The usage investments and expenses calculated by service type in Section V are combined with other per line investments (i.e.: Loop, NTSCOE, Billing and Collection, and Directory Listing) to provide a total investment by component and for total service studied, (i.e. 1FR, 1FB, etc.).

Each investment by account code, service and also by each component, are entered into the Retail Cost Program to calculate costs for each service. The program applies the appropriate annual cost factors for the jurisdiction and services being studied. These costs include:

(1). **Investment Based monthly Direct Costs:** depreciation, cost of money, income tax expense, maintenance, right to use, ad valorem tax.

(2). **Land and Building costs.**

(3). **Commercial Costs by Product Group:** Product Management, Sales Expense,

Product Advertising Expense, and Business Fees.

(4). **Network Support:** Network Operations and Network Support Assets.

Recurring costs are displayed by product, cost component, and by rate zone where appropriate.

2. NONRECURRING

Nonrecurring costs represent the one-time charges that apply for specific work activities. Included in this study are the provisioning activities involved in providing Business and Residence Access Lines in order to develop the Nonrecurring cost. Following is a description of the required cost inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained from field experts who actually perform the work being studied and/or Subject Matter Experts on staff representing the work group.

Company objectives for Dedicated Inside Plant (DIP) for the Central Office Frame are used to

develop a probability which weights the cost of placing and removing jumpers when a line is established or removed.

Company objectives for the flow thru percentages for the Facility Assignment and Control System (FACS) are utilized to develop a probability which weights the cost of manual processing in the Loop Provisioning Center (LPC).

Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does not measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

E. STUDY ASSUMPTIONS

A. ARIZONA RATE ZONE CREATION:

The following assumptions were used to create the three rate zones for Arizona using the IFT Data Base. The IFT Data Base identifies the number of working lines for each wire center.

Inside The Base Rate Area: The IFT Data Base was used to determine the percentage of working lines Inside The Base Rate Area (IBRA). This percentage was used to determine the kilofoot crossover boundary between IBRA and Zone 1 by wire center group. This crossover point represented the IBRA boundary before the zone was expanded. In order to account for the IBRA expansion, Public Policy determined the new IBRA areas by Wire Center and these areas were compared to the old IBRA areas. The difference between the new IBRA areas and the old was converted to a Kilofoot distance, and this distance was added to the original crossover point, delineating the new IBRA boundary.

Zone 1: Zone 1 extends for a mile beyond the IBRA Zone.

Zone 2: Zone 2 extends from the cut off for Zone 1 to 100 kilofeet from the Central Office.

B. Costs do not reflect the emergence of widespread competition in the local exchange market.

C. All network investments are forward-looking:

i. Switching and transport equipment and facilities are digital.
ii. SONET is the forward looking technology in the interoffice network.
iii. Loop facilities include a least cost mix of loop technologies, including twisted pair copper and fiber optic facilities in the feeder plant, along with digital and analog pair gain equipment.

D. The loop and drop investments in this study are based on weighting together loop samples from all classes of service to produce a statewide average investment per loop. Product group factors are applied to this investment to develop a service specific loop and drop cost.

1999 USWC WHOLESALE DIRECTORY ASSISTANCE COST STUDY

PURPOSE

The purpose of this study is to determine the 1999 costs to U S WEST Communications for providing Directory Assistance (DA) service to wholesale customers. The study results are expressed using Long Run Incremental Cost (LRIC) format and represent an average cost per Directory Assistance call.

DESCRIPTION

Directory Assistance service provides telephone number and address information for the business, residence, or government listing the caller requests.

METHODOLOGY

The cost components included in this study are operator related expenses, equipment related expenses, and dedicated facilities expenses.

The costs for the operator related component was developed on a per call basis. The costs per call for the equipment and the dedicated facilities components are determined by dividing expenses by appropriate call volumes. The Retail Cost Program is utilized to apply appropriate loading factors, investment based factors, and expense based factors to these cost components.

DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs – Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which benefit the

provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC. Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

ASSUMPTIONS

1. The 1999 operator related labor cost was developed using a labor rate, customer service time and occupancy percent provided by Operator & Information Svsc. (O&IS) representing the "B" operator group handling wholesale traffic.

2. The peripheral switch hardware and software RTU expenses were provided by O&IS.

3. The terminal/position hardware, hardware maintenance, and software RTU expenses were provided by O&IS.

4. The database hardware, hardware maintenance, and software RTU expenses were provided by O&IS.

5. The dedicated facility routes were identified by O&IS. Leased facility costs were obtained from the Network Programs & Operations group.

6. All costs include appropriate investment based and /or expense based factors.

7. The call volumes used in this study were provided by O&IS.

PRIVATE LINE TRANSPORT SERVICES

RECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's 1998 long-run incremental costs for Private Line Transport Services within the state of Arizona.

This study develops statewide average long run incremental costs. Costs are stated on a per point of termination basis.

Private Line Transport Services costs are provided for Network Access Channel (NAC), Channel Performance and Optional Features and Functions and Transport for DSO/VF.

B. DESCRIPTION OF SERVICE

Private Line Transport Services provides the transmission facilities between the customer designated premises, to the serving wire center or a Company Hub where bridging, multiplexing or connection to other services functions are performed or to other customer designated premises. Voice Grade/DSO facilities are available for Network Access Channel, Channel Performance and for Interoffice Transport facilities.

This cost study includes the costs for the following components:

a. The Network Access Channel (NAC) rate category provides for the communications path between the Demarcation Point and the serving wire enter of that customer designated premises. One Network Access Channel charge applies per channel terminated at the Demarcation Point. The NAC costs are comprised of a 2-wire and a 4-wire facility, local subscriber loop and drop and a portion of the central office Main Distributing Frame (MDF) that is used to make loop connections.

b. Interoffice Transport Channel rate category provides for the transmission facilities between the serving wire centers associated with two customer locations, between a serving wire center associated with a customer location and a Company Hub or between two Company Hubs. Transport consists of two elements: fixed costs and equipment at both ends of the transmission path. The per mile costs contain the costs associated with cable, repeaters, and intermediate central office equipment. The fixed costs are expressed per Voice Grade circuit and the per mile costs are expressed per Voice Grade circuit, per airline mile. For purposes of determining the per-mile rate, mileage is measured using the V & H coordinates method.

c. The Channel Performance rate category provides the electronic equipment, which is added to the Network Access Channel to provide the desired level of transmission performance. It modifies the circuit with the basic performance necessary for the circuit function. If appropriate, it may also provide various signaling parameters to enhance the basic performance. Channel Performances are optional channel functions that may be added to provide characteristics not included with the standard capabilities of the basic Network Access Channel. One Channel Performance charge will apply per channel terminated at the Demarcation Point on the property where the customer is served.

The following are definitions of the Channel Performance and Other Features and Functions services provided by U S WEST Communications.

1. Voice Grade Service Channel Performance

End-Link or Mid-Link Applications. This application is intended for customers requiring Dedicated Transport as part of an overall circuit extending beyond the LATA. Several channel performances are available to facilitate circuit compatibility and a mechanized Design Layout Report (DLR) is available to assist the customer with the overall circuit design. The network channel interface between the LEC facility and the remainder of the overall circuit is referred to as the Mid User Point Of Termination (POT). The network channel interface that is at the terminating end of the overall circuit is referred to as the End User POT. Following are the service categories that normally apply to the End-Link or Mid-Link Voice Grade Service application:

VG1-- Suitable for use as a basic two-point non-switched voice circuit where the higher transmission quality of other end-link services is not required. The transmission interfaces are either two wire or four wire.

VG2-- Suitable for use as a voice two-point or multi-point dedicated circuit and switched special service circuit. The transmission interfaces are either two wire or four wire.

VG3-- Suitable for use as a two-point voice trunk type circuit. The transmission interfaces are either two wire or four wire.

VG5-- Suitable for use as a two-point or multi-point voice grade data alarm type circuit. The transmission interfaces are either two wire or four wire.

VG6-- Suitable for voice grade analog data circuits, (applications may be limited). This service is provided on a two-point or multi-point basis. The transmission interfaces are provided on a four wire basis only.

VG7-- Suitable for two-point use for a switched or non-switched data circuit. The transmission inter-faces are either two wire or four wire.

VG8-- Suitable for trunk type voice grade data circuit applications. This service is provided on a

two-point basis only. The transmission interfaces are either two wire or four wire.

VG9-- Suitable for two way simultaneous voice grade data circuit applications. This service is provided on a two-point basis only. The transmission interfaces are provided on four wire basis only.

VG10-- Suitable for a specialized simultaneous two way voice grade analog data circuit that extends LEC Digital Data Service into areas without digital data service facilities. This service is provided on a two-point or multi-point basis. The transmission interfaces are provided as either two wire or four Wire.

VG12-- Suitable for specialized voice grade dedicated audio tone protective relaying circuits. High Voltage Power protection is required for provision of VG12 service. This service is provided on a two-point or multi-point basis. The transmission interfaces are provided as either two wire or four wire.

End-To-End Applications. This application is intended for customers requiring overall Dedicated Transport within the LATA. No DLR mechanized Design Layout Report is provided since the performance and maintenance will be the responsibility of the LEC. The network channel interface that is at the terminating end of the overall circuit is referred to as the End User POT. Following are the service categories that normally apply to the End-to-End application:

VG32-- Suitable for use as a two-point or multi-point line-type circuit. The basic channel is modified with Channel Performance providing no signaling, loop start, automatic, manual or code select signaling. Data capability may be added to specific combinations of loop start signaling circuits. The loop start signaling option provides the additional capabilities of extending the signaling ranges and of offering repeated ringing for PBX station ports.

VG33-- Suitable for use as a two-point trunk type circuit. The basic channel is modified with channel performance providing no signaling, E&M or ground start signaling. Data capability may be added to specific combinations of E&M or ground start signaling circuits.

VG36-- Suitable for use as a two-point or multi-point voice grade (analog) circuit. All channels are provided with basic data transmission parameters modified by the appropriate Channel Performance. Additional conditioning parameters may be added to the basic channel performance. These conditioning parameters allow the selection of attenuation distortion/envelope delay and inter modulation distortion as needed.

Voice Grade Basic (VGB)--This service is a two-point and two wire transmission service designed to provide a low cost communications path between two locations served from the same wire center. This service does not provide technical specifications or signaling and there is no guarantee of continuity.

End-Link or Mid-Link And End-To-End Applications. A custom voice service may be provided upon request to meet specific customer needs not provided by the standard AP Channel

Performances. These custom voice services are treated as "VGC" as described below.

Voice Grade Custom (VGC)--VGC service is a voice grade service that may be customized by specifying any of the technical specifications for VG1 through VG12 or VG32 through VG36. The specifications and interfaces chosen must be technically compatible, technically feasible and available. VGC is recommended when either no other VG type from more than one of the other VG types does meet the customer requirements or the customer specifications are provided for by combinations of other VG types that may be feasibly provided.

Local Area Data Service (LADS) is furnished by the Company subject to the availability of facilities suitable for base band transmission for digital data signals between two points within the same serving wire center area. Normal service is provided between two points that are not more than six route miles apart, as determined by the Company, using norm cable routing between the points to be served. Channel lengths in excess of three route miles per end from the serving wire center may be provided, however, a special construction charge will apply to delta and reload the cable to the original exchange specifications. The Company will not guarantee the noise and the insertion loss characteristics of circuits in excess of six route miles.

2. *Voice Grade Service Optional Features And Functions*

▪*Central Office Bridging*. This optional feature provides the capability to connect three or more customer designated premises. **Resistive Bridging** is used on two and four wire voice grade services connected for voice or data communications. A **Bridge Lifter** provides a two wire bridge capability that allows the connection of two stations to a single PBX or Centrex type line. A **Split Frequency Bridge provides** for a four wire (master station) split frequency bridge and multiple two wire (remote station) ports. **Passive Bridging** provides for a two wire (master station) common port and multiple two wire (remote station) ports. Passive Bridging is intended for two way polling communication between the master station and each remote station (up to a maximum of ten points). **Summation Bridging** provides for a two wire (master station) common port and multiple two wire (remote station) ports; This arrangement is used for
one way communication from each remote station to the master station (the combined power in the voice band of simultaneous data tones can not exceed 13 dbmO).

▪*Transfer Arrangement.* This is another type of bridging arrangement used to transfer Dedicated Transport from one circuit leg to another circuit leg that terminates in either the same or a different customer designated premises. A customer premises control key, connected to a low speed data channel, is required to operate this transfer arrangement.

▪*Conditioning*. Enhanced transmission characteristics may be provided by conditioning voice grade services. Various conditioning options permit a customer to specify attenuation distortion, envelope delay distortion, inter modulation distortion or signal to C-notched noise. The conditioning required is specified by several standard "C" conditioning levels identified as Cl, C2 and C4.

▪*Data Enhancement.* This is a form of conditioning that permits the addition of data parameters

on voice grade 32 and 33 services to provide alternate voice and data use.

▪*Effective Four Wire Transmission With Two Wire Interface.* This is a hybrid option that allows a customer to specify that transmission through the network be accomplished on a four wire basis with conversion to two wire service at a two wire interface located on the customer premises.

▪*Equal Level Echo Path Loss.* This option is available on an effective two wire transmission at the four wire Point Of Termination (POT). A more stringent control of echo return loss and singing return loss is possible with the use of this arrangement. This option is provided only when the transmission path is four wire at one POT and two wire at the other POT. This arrangement is referred to as ELEPL-2.

▪*Improved Return Loss.* This option is available on an effective two wire transmission at the two wire POT (Point Of Termination). It provides more stringent echo control specifications. This option may only be provided when the transmission path is four wire at one POT and two wire at the other POT.

▪*Improved Termination.* Where applicable, this option provides a matching 600 ohm impedance level at a four wire POT, an extended range of customer specified levels (-16 to +7 TLP [Transmission Level Point]) and simplex reversal. Equipment must be placed at the customer premises for this option.

3. Low-Speed (Narrow Band) Analog Data Service Channel Performance

End-Link or Mid-Link Applications. This application is intended for customers requiring dedicated Transport as part of an overall circuit, extending beyond the LATA. Several Channel Performances are available to facilitate circuit compatibility and a mechanized Design Layout Report (DLR) is available to assist the customer with the overall circuit design. The network channel interface between the LEC facility and the remainder of the overall circuit is referred to as the Mid User Point Of Termination (POT). The network channel interface that is at the terminating end of the overall circuit is referred to as the End User POT. Following are the service categories that normally apply to the end-link or mid-link low speed data application:

LS1-- A circuit suitable for signal transfer rates up to 30 baud. This service is provided over metallic or other appropriate facilities. This service is provided on a two-point basis only and the transmission interfaces are only available on a two wire basis.

LS2-- A circuit suitable for transporting the three-level signal used in the McCulloh Loop Signaling System at speeds up to 15 baud. This service is provided over metallic or other appropriate facilities. This service is provided on a two-point basis only and the transmission interfaces are only available on a two wire basis.

MT3-- A circuit suitable for the transmission of 60 Hz control signals and DC current. This service is provided over metallic facilities. This service is provided on a two-point or multi-point basis and the transmission interfaces are only available on a two wire basis. This service is

available on an intraoffice basis only where facilities and operations permit.

TGI-- A circuit suitable for the transmission of asynchronous transitions between two current levels at rates up to 75 baud. This service is provided on a two-point or multi-point basis and the transmission interfaces are available on both a two wire and a four wire basis.

TG2-- A circuit suitable for the transmission of asynchronous transitions between two current levels at rates up to 150 baud. This service is provided on a two-point or multi-point basis and the transmission interfaces are available on both a two wire and a four wire basis.

End-To-EndApplications. This application is intended for customers requiring overall dedicated Transport within the LATA. No DLR mechanized Design Layout Report is provided since the performance and maintenance will be the responsibility of the LEC. The network channel interface that is at the terminating end of the overall circuit is referred to as the End User POT.

Following are the service categories that normally apply to the End-to-End application:

LS31-- Provides for data transfer at speeds within the range of 0 to 150 baud. The channel is further defined by speed into the following functions:

- *0 to 30 baud* channels provide: (1) two point service used for key control circuits or remote status monitoring, furnished on a two wire only basis; (2) two-point or multi-point service intended for use in McCulloh Alarm type applications, furnished on a two wire only basis; and, (3) DC channel (metallic channel) current interfaces on a two wire basis. Available at the option of the LEC, on aerial intraoffice basis, only where facilities and operations permit (this two-point or multi-point service is intended for applications where DC continuity is required).

- *0 to 75 baud* channels are available on a two-point or multi-point basis and are intended for telegraph grade application.

- *0 to 150 baud* channels provide an EIA RS 232 interface. The service is available on a two-point or multi-point basis ailed is intended for telegraph grade applications.

End-Link or Mid-Link And End-To-End Applications. A custom Low-Speed Data channel may be provided upon request when parameters and/or features are not provided by the standard Low-Speed Data channels.

4. Low-Speed (Narrow Band) Analog Data Service Optional Features And Functions

▪*Central Office Bridging.* McCulloh Bridging allows the connection of up to twenty-six customer premises. This bridging is only available with McCulloh Alarm type service. Telegraph Bridging allows the connection of three or more customer designated premises. Direct Bridging allows the connection of three or more customer designated premises on the DC channel.

5. Audio Service Channel Performance

End-Link Or Mid-Link Applications. This application is intended for customers requiring dedicated Transport as part of an overall circuit, extending beyond the LATA. Several Channel Performances are available to facilitate circuit compatibility and a mechanized Design Layout Report (DLR) is available to assist the customer with the overall circuit design. The network channel interface between the LEC facility and the remainder of the overall circuit is referred to as the Mid User POT (Point Of Termination). The network channel interface that is at the terminating end of the overall circuit is referred to as the End User POT. Following are the service categories that normally apply to the end-link or mid-link low speed data application:

AP1-- Provides a channel with a nominal band pass from 200 to 3,500 Hz.

AP2-- Provides a channel with a nominal band pass from 100 to 5,000 Hz.

AP3-- Provides a channel with a nominal band pass from 50 to 8,000 Hz.

AP4-- Provides a channel with a nominal band pass from 50 to 15~000 Hz.

End-To-End Applications. This application is intended for customers requiring overall dedicated Transport within the LATA. No DLR mechanized Design Layout Report is provided since the performance and maintenance will be the responsibility of the LEC. The network channel interface that is at the terminating end of the overall circuit is referred to as the End User POT. Following are the service categories that normally apply to the End-to-End application:

AP31-- Provides a non-equalized channel with a nominal band pass from 200 to 3,000 Hz.

AP32-- Provides a non-equalized channel with a nominal band pass from 100 to 5,000 Hz.

AP33-- Provides a non-equalized channel with a nominal band pass from 50 to 8,000 Hz.

AP34-- Provides a non-equalized channel with a nominal band pass from 50 to 15,000 Hz.

End-Link or Mid-Link And End-To-End Applications. A custom audio service may be provided upon request to meet specific customer needs not provided by the standard AP Channel Performances.

6. Audio Service Optional Features And Functions

▪*Central Office Bridging* (Distribution Amplifier)--is offered for connection of multiple customer designated premises of three or more.

C. STUDY METHODOLOGY

U S WEST Communications (USWC) uses three cost models to calculate the long run

incremental costs associated with its network, the Transport Model(TM), the Loop Module Model and Channel Transmission Equipment Calculator (CTEC) Model. These models calculate the incremental costs of essential network components. The Retail Cost Program calculates the incremental costs of network components based on investment input from these models.

The Loop Module model develops investments for the Network Access Channel (NAC). The model develops investments separately for feeder and distribution loop plant. The Loop Module also includes a unit investment file that includes the cost of each investment component. Detailed description of this model can be found in the Cost filing package under Model Descriptions.

The Interoffice Transport investments were calculated using the Transport Module (TM). TM calculates the weighted average installed investment required for transport over the U S WEST interoffice network. Weighted average investment is obtained by weighting the investments for various forward looking interoffice facility configurations by a state specific probability of occurrence. Detailed description of this model can be found in the Cost filing package under Model Descriptions.

U S WEST uses the Channel Transmission Equipment Calculator (CTEC) to calculate the Long Run Incremental investment for analog Private Line service. The CTEC model contains several modules that calculate the Channel Performance and Optional Features and Functions investment for these two network services.

The Retail Cost Program was used to convert installed investments to monthly costs by applying appropriate investment and expense factors to the installed investment.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

> **Total Direct Costs** -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

SECTION 2
STUDY ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. It is assumed that facilities are placed given today's actual field conditions. This leads to a greater percent of facilities placement under difficult conditions than would occur with an assumption of "green field" (i.e., easy placement) conditions.

c. All network investments are forward-looking:

- Transport equipment and facilities are digital.
- SONET is the forward looking technology in the interoffice network.
- Loop facilities include a least cost mix of loop technologies, including twisted pair copper and fiber optic facilities in the feeder plant, along with digital and analog pair gain equipment.

d. Additional assumptions used in the NAC, CTEC and Transport Models may be found in the documentation of the models.

PRIVATE LINE TRANSPORT SERVICE

NONRECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

This study estimates forward-looking nonrecurring long run incremental costs U S WEST will incur to provide Private Line Transport Service. The study results represent direct 1998 costs. The results of this study may be used for pricing and other management decisions.

B. DESCRIPTION OF SERVICE

Private Line Transport is the furnishing of Company facilities for communication purposes of the customer. It provides a transmission path between customer designated premises or customer designated premises and a Serving Wire Center.

The Nonrecurring costs for Private Line Transport are the one-time costs incurred by the Company to provide the service requested by the customer. These costs vary by the type of Private Line Transport specified to meet the customers communication requirements. Each service type varies by transmission performance design and testing activity.

PRIVATE LINE TRANSPORT SERVICE TYPES

The types of services used to provide Private Line Transport are:

Low Speed Data - a channel for the transmission of low speed loop status signals of up to 150 baud and for the transmission of McCulloh type alarm signals.

Voice Grade - a channel for the transmission of analog signals within an approximate bandwidth of 300-3000 Hz.

Dataphone Select-a-Station - requires the use of Voice Grade Service for data transmission.

Local Area Data Service (LADS) - a channel suitable for baseband transmission of digital data signals between points within the same serving wire center area.

Audio - a channel for the transmission of audio signals. The nominal frequency bandwidths are from 200 to 3500 Hz, from 100 to 5000 Hz, from 50 to 8000 Hz or from 50 to 15000 Hz.

Foreign Exchange (FX) - provides dial tone from a wire center in an exchange from which the customer is not normally served.

Foreign Central Office - provides dial tone from a serving wire center to a remote wire center in the same exchange.

Exchange Service Extension (ESE) - a channel which extends dial tone from a customer's serving wire center to a noncontinuous property station location.

Telephone Answering Service (TAS) - channel from a patron's central office to the Answering Bureau.

COST ELEMENT DESCRIPTION

Service Provisioning

The Service Provisioning cost estimates the cost of processing an order related to the activities associated with every order regardless of service type, i.e., negotiating. logging, completing etc. The cost is per circuit and includes an Initial Service Provisioning cost and a Subsequent Service Provisioning cost which reflects the economies when ordering a circuit at the same time and same location as the initial circuit. In addition, an Initial and Subsequent Nondesigned Service Provisioning Cost for those services that take a POTS order flow when they are in the Same Wire Center, was provided.

Channel Transmission Performance

The Channel Transmission Performance cost estimates the cost to design and provision a circuit based on the service type and predefined technical specifications. It includes wiring and/or testing in the CO and at the customer premises and other activities unique to each service type. The costs are per termination.

Transport Channels

The Transport Channel estimates the cost to provision the transmission facilities between the serving wire centers associated with two customer designated premises. Cost is per channel.

Optional Features and Functions

Optional features and functions provides options which may be added to Private Line Service to improve its quality or utility to meet specific requirements. These are not necessarily identifiable with specific equipment, but rather represent the end result in terms of performance characteristics which may be obtained. The costs are estimates of time required to wire or test, and/or design specific parameters to meet the customers specifications.

Examples of Optional Features and Functions that are available include, but are not limited to, the following:
- Bridging
- Conditioning
- Transfer Arrangements

C. STUDY METHODOLOGY

Nonrecurring costs represent the one-time charges that apply for specific work activities. We study the provisioning activities involved in providing a service in order to develop the Nonrecurring cost. Following is a description of the required cost inputs:

Time Estimates
The time estimate is the average amount of time required to perform a particular work function.

Probabilities

A probability is the percent of time a particular work function is performed for a particular service offering. Probabilities were developed from reports and by field experts.

Expense Factors
The program applies expense factors to the direct cost. The factors include Business Fees and assignable Administrative Expense.

Labor Rates
Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the U S WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., motor vehicle expense, general purpose tools, etc.)

<u>NONRECURRING COST PROGRAM</u>

The Nonrecurring Cost Program (NRC) performs the mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Total Service Long Run Incremental (TSLRIC) results.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

DIGITAL DATA SERVICE RECURRING COST STUDY

A. PURPOSE, SCOPE AND APPLICATION

The purpose of this study is to estimate U S WEST's 1998 long-run incremental costs for Digital Data Service within the state of Arizona.

This study develops state wide average long run incremental costs. Costs are stated on a per point of termination basis.

Digital Data Service costs are provided for Network Access Channel (NAC), Channel Performance and Transport for DS0.

B. DESCRIPTION OF SERVICE

Digital Data Service provides the transmission facilities between the customer designated premises and the serving wire center or a company hub, where bridging, multiplexing or connection to other service functions are performed, or to another customer designated premises. DS0 facilities are available for Network Access Channel, Channel Performance and Interoffice Transport facilities.

This cost study includes the costs for the following components:

a. The Network Access Channel (NAC) rate category provides for the communications path between the demarcation point and the serving wire center of that customer designated premises. One NAC charge applies per channel terminated at the demarcation point. The NAC costs are comprised of a 4-wire facility (local subscriber loop and drop) and a portion of the central office Main Distributing Frame (MDF) that is used to make loop connections.

b. The Interoffice Transport Channel rate category provides for the transmission facilities between the serving wire centers associated with two customer locations, or between a serving wire center associated with a customer location and a company hub, or between two company hubs. Transport consists of two elements; fixed costs and per mile costs. The fixed costs are equipment at both ends of the transmission path. The per mile costs contain the costs associated with cable, repeaters, and intermediate central office equipment. The fixed costs are expressed per DS0 circuit. The per mile costs are expressed per DS0 circuit, per airline mile. For purposes of determining the per-mile rate, mileage is measured using the Vertical and Horizontal (V & H) coordinates method.

c. The Channel Performance rate category provides the electronic equipment which is added to the Network Access Channel to provide the desired level of transmission performance. It modifies the circuit with the basic performance necessary for the circuit function. If appropriate, it may also provide various signaling parameters to enhance the basic performance. Channel Performance are optional channel functions that may be added to provide characteristics not included with the standard capabilities of the basic Network Access Channel. One Channel Performance charge will apply per channel terminated at the demarcation point on the property where the customer is served.

The following are definitions of the Channel Performance and Other Features and Functions services provided by U S WEST Communications.

Low-Speed Digital Data Service is provided on a two-point or multi-point, four wire basis and is capable of transmission of synchronous serial data at rates below 1.544 Mbps. This includes the service normally called DDS (Digital Data Service), which operates at 2.4, 4.8, 9.6, 19.2, 56 or 64 Kbps. The actual bit rate for Digital Data Service is a function of the channel interface selected by the customer, where applicable. DDS circuits provide a synchronous service with timing provided by the Local Exchange Carrier, (LEC) through company facilities to the customer in the received bit stream. Digital Data Service may be provided between designated customer premises, between a customer premises and a LEC hub or between LEC hubs.

1. Low-Speed (Narrow Band) Digital Data Service Channel Performance

- 2.4 Kbps (NC US/PM 24) Digital Data Service is offered at a 2.4 kbps bit rate.
- 4.8 Kbps (NC US/PM 48) Digital Data Service is offered at a 4.8 kbps bit rate.
- 9.6 Kbps (NC US/PM 96) Digital Data Service is offered at a 9.6 kbps bit rate.
- 19.2 Kbps (NC US/PM 19) Digital Data Service is offered at a 19.2 kbps bit rate.
- 56.0 Kbps (NC US/PM 56) Digital Data Service is offered at a 56.0 kbps bit rate.
- 64.0 Kbps (NC US/PM 64) Digital Data Service is offered at a 64.0 kbps bit rate.

2. Low-Speed (Narrow Band) Digital Data Service Optional Features And Functions

- Bridging.
  This optional feature provides an arrangement within a hub that permits circuits to be connected together to form multi-point networks. In this type of arrangement a customer may transmit information from one location to many locations simultaneously and/or receive communications at a single location from many locations.

- Secondary Channel.

  This optional feature allows diagnostic, maintenance and network administration functions to be performed. This capability is available with the LEC Digital Data Service 2.4, 4.8, 9.6, 19.2, 56 and 64 Kbps circuits on both two-point and multi-point arrangements. This service is only provided where equipment and facilities are available.

  Customer provided equipment interfacing with Secondary Channel service must conform to Technical Publication # TR-NPL-000157.

C. STUDY METHODOLOGY

U S WEST Communications (USWC) uses three cost models to calculate the long run incremental costs associated with its network, the Transport Model(TM), the Loop Module Model and Channel Transmission Equipment Calculator (CTEC) Model. These models calculate the incremental costs of essential network components. The Retail Cost Program calculates the incremental costs of network components based on investment input from these models.

The Loop Module model develops investments for the Network Access Channel (NAC). The model develops investments separately for feeder and distribution loop plant. The Loop Module also includes a unit investment file that includes the cost of each investment component. Detailed description of this model can be found in the Cost filing package under Model Descriptions.

The Interoffice Transport investments were calculated using the Transport Module (TM). TM calculates the weighted average installed investment required for transport over the U S WEST interoffice network. Weighted average investment is obtained by weighting the investments for various forward looking interoffice facility configurations by a state specific probability of occurrence. Detailed description of this model can be found in the Cost filing package under Model Descriptions.

U S WEST uses the Channel Transmission Equipment Calculator (CTEC) to calculate the Long Run Incremental investment for Digital Data Service. The CTEC model contains several modules that calculate the Channel Performance and Optional Features and Functions investment.

The Retail Cost Program was used to convert installed investments to monthly costs by applying appropriate investment and expense factors to the installed investment.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

STUDY ASSUMPTIONS

1. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

2. It is assumed that facilities are placed given today's actual field conditions. This leads to a greater percent of facilities placement under difficult conditions than would occur with an assumption of "green field" (i.e., easy placement) conditions.

3. All network investments are forward-looking:

- Transport equipment and facilities are digital.
- SONET is the forward looking technology in the interoffice network.
- Loop facilities include a least cost mix of loop technologies, including twisted pair copper and fiber optic facilities in the feeder plant, along with digital and analog pair gain equipment.

4. Additional assumptions used in the NAC, CTEC and Transport Models may be found in the documentation of the those models.

OPERATOR SERVICES SURCHARGE COST STUDY

PURPOSE

The purpose of this study is to estimate the 1998 long run incremental costs (LRIC) that USW will incur for provisioning Operator Services surcharges to its retail market. This study uses USW economic life factors. This study calculates the incremental cost of an Operator Services System (OSS) processed call (either machine handled or operator handled) over a Direct Distance Dialed (DDD) call. The results are expressed on a per billable message (completed call) for six classifications of call types.

DESCRIPTION

USWC traffic requiring Operator Services System support will be routed to an Operator Position System . The system will, if possible, perform the needed validation and call identification for billing purposes without operator intervention. These are commonly called machine handled calls. Those calls requiring operator support, called operator handled calls, are routed to a position and are handled according to established methods and procedures. OSS support is complete when the operator has released the call from the position or, in the case of machine handled calls, when call identification and validation requirements are met.

A message is defined as a completed call. For the purpose of this study, the six categories of billable messages are defined as follows:

a. PERSON: All messages which are class charged by the operator at the person rate regardless of the method of billing.

b. CALLING CARD: All messages which are station rated, customer dialed, and billed to a calling card; both Mechanized Calling Card System (MCCS) and 0+ calling card / special billing number messages.

c. STATION: All messages which are station rated and billed as sent paid (operator handled), collect, special reverse charge, billed to a third number, Automated Coin Telephone System (ACTS), operator dialed calling card / special billing number, or revenue producing connect to Directory Assistance.

d. BUSY LINE VERIFY: All messages for which the operator classed the call as a chargeable verification, regardless of the method of billing.

e. BUSY LINE INTERRUPT: All messages for which the operator classed the call as a chargeable interruption, regardless of the method of billing.

f. CONNECT TO DA: All messages for which the operator classed the call as a

chargeable connection to Directory Assistance, regardless of the method of billing.

METHODOLOGY

This study is designed to estimate the incremental costs associated with the provision of operator services for Exchanges Carriers. Included in the study methodology are the costs attributed to the following:

1. Operator related expense (wage, pension and benefits, supervision)
2. Switching systems
3. Dedicated facilities
4. Costs unique to particular call types

This analysis used the Operator Services Cost Analysis Program (OSCAP) to estimate call type patterns. Added to the study cost per message output is a Billing and Collections cost per line per message.

Detailed model descriptions can be found in the cost filing package under Model Description.

The study uses data from the OSCAP model from June, 1997 through May, 1998.

DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST Communications uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to change in output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total Direct cost is the total forward-looking direct cost of providing a product or service to the total universe of U S WEST Customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Cost –The network administration costs including engineering that can be directly identified to the provision of a group of services. The level of these costs

varies directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost (SC).

Total Direct plus Network Support Costs --Is the sum of Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC+SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. TSLRIC also includes ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, ad Valorem taxes and business fees.

ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. All network investments are forward-looking:

i. Switching and transport equipment and facilities are digital.
ii. SONET is the forward looking technology in the interoffice network.

DS3 SWITCHED TRANSPORT

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's - 1998 long-run incremental costs that would be incurred to provide for the DS3 Switched Transport components of Switched Access Service.

This study develops statewide average Long Run Incremental Costs (LRIC). Costs are specific to the state of Arizona and are stated on a per DS3 basis, unless specified otherwise.

B. DESCRIPTION OF SERVICE

U S WEST DS3 Service is capable of transmitting electrical signals at a nominal 44.736 Mbps with the capability to channelize up to 672 voice-frequency transmission paths. DS3 facilities are available for Entrance Facilities and Direct Trunk Transfer (DTT) facilities. DS3 Service is available utilizing an Electrical or Optical Interface.

These are the basic rate categories addressed in this study which apply to U S WEST DS3 Switched Transport service:

- Entrance Facility
- Direct-Trunked Transport
- DS3 to DS1 Multiplexing

DS3 Entrance Facility: Provides for the communications path between the Demarcation Point at the customer designated premises, and the Serving Wire Center of that premises. It includes the fiber facility and supporting structure, transmission and terminating equipment at the serving wire center and customer premises. Entrance Facility costs are developed as a weighted average cost per DS3.

Direct-Trunked Transport: Consists of two elements; fixed costs and per mile costs. The fixed element contains the costs associated with the terminating equipment at both ends of the transmission path. The per mile costs contain the costs associated with cable, repeaters, and intermediate central office equipment. The fixed costs are expressed per DS3 circuit and the per mile costs are expressed per DS3 circuit, per airline mile

DS3 to DS1 Multiplexing: Central Office Multiplexing includes the equipment necessary for an arrangement that converts a DS3 channel to twenty-eight DS1 (1.544 Mbps) channels utilizing time division multiplexing.

C. STUDY METHODOLOGY

DS3 Entrance Facility (EF) - EF investments are calculated using a Microsoft Excel® spreadsheet based model called the NAC (Network Access Channel) model. The NAC model estimates the forward looking installed investment associated with DS3 circuits between a serving central office and an end user location. Detailed description of this model can be found in the U S WEST Cost manual.

Direct-Trunked Transport - The Interoffice Transport investments were calculated using the Transport Module (TM). TM calculates the weighted average installed investment required for transport over the U S WEST interoffice network. Weighted average investment is obtained by weighting the investments for various forward looking interoffice facility configurations by a probability of occurrence. Detailed description of this model can be found in the U S WEST Cost manual.

DS3 to DS1 Multiplexing - The installed investments for the Central Office Multiplex Option were calculated based on the required equipment specified by Network Standard Configurations.

There is no advertising included in this study since this element is not advertised nor offered separately from the switched access service of which this element is a part.

The RETAIL Cost Program (please refer to U S WEST Cost manual for description) was used to convert installed investments to monthly costs by applying appropriate investment and expense factors to the installed investment.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST Communications uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does not measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct cost are the total forward-looking direct cost of

providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Cost -- The network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Is the sum of Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. It also includes ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

STUDY ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. It is assumed that facilities are placed given today's actual field conditions. This leads to a greater percent of facilities placement under difficult conditions than would occur with an assumption of "green field" (i.e., easy placement) conditions.

c. All equipment investments for both Direct-Trunked Transport (TM) and the Entrance Facility (NAC model) are comprised of forward looking SONET (Synchronous Optical NETwork) digital equipment.

d. Additional assumptions used in the NAC and Transport models may be found in the documentation of those models.

RESIDENCE OPTIONAL CALLING PLANS
NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the 1998 nonrecurring long run incremental costs (LRIC) U S WEST Communications will incur to provide a Residence Optional Calling Plan within the state of Arizona. The study results represent direct 1998 costs.

B. DESCRIPTION OF SERVICE

Optional Calling Plans / Billing Arrangements offer toll customers discount opportunities. A customer can pay a flat fee to receive the discount or the customer may buy a block of time at a discounted rate. The flat fee or the block of time rate apply whether or not the customer makes any calls

COST ELEMENT DESCRIPTION

This study estimates the statewide average nonrecurring costs that apply for ordering an Residence Optional Calling Plan. The cost is illustrated on a per line basis.

C. STUDY METHODOLOGY

Nonrecurring costs represent the one-time costs that apply for specific work activities to install and disconnect service. We study the various activities involved in providing the service in order to develop the nonrecurring cost. Following is a description of the required data inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the

general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

C. STUDY METHODOLOGY (cont.)

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained from field experts who actually perform the work being studied and/or Subject Matter Experts on staff representing the work group.

Company objectives for Dedicated Inside Plant (DIP) for the Central Office Frame are used to develop a probability which weights the cost of placing and removing jumpers when a line is established or removed.

Company objectives for the flow thru percentages for the Facility Assignment and Control System (FACS) are utilized to develop a probability which weights the cost of manual processing in the Loop Provisioning Center (LPC).

Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure

historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS (cont.)

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

E. Study Assumptions

The cost factors used in this study are based on Economic Lives.

BUSINESS OPTIONAL CALLING PLANS
NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the 1998 nonrecurring long run incremental costs (LRIC) U S WEST Communications will incur to provide a Business Optional Calling Plan within the state of Arizona. The study results represent direct 1998 costs.

B. DESCRIPTION OF SERVICE

Optional Calling Plans / Billing Arrangements offer toll customers discount opportunities. A customer can pay a flat fee to receive the discount or the customer may buy a block of time at a discounted rate. The flat fee or the block of time rate apply whether or not the customer makes any calls.

COST ELEMENT DESCRIPTION

This study estimates the statewide average nonrecurring costs that apply for ordering a Business Access Line. The cost is illustrated on a per line basis.

C. STUDY METHODOLOGY

Nonrecurring costs represent the one-time costs that apply for specific work activities to install and disconnect service. We study the various activities involved in providing the service in order to develop the nonrecurring cost. Following is a description of the required data inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be

directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

C. STUDY METHODOLOGY (cont.)

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained from field experts who actually perform the work being studied and/or Subject Matter Experts on staff representing the work group.

Company objectives for Dedicated Inside Plant (DIP) for the Central Office Frame are used to develop a probability which weights the cost of placing and removing jumpers when a line is established or removed.

Company objectives for the flow thru percentages for the Facility Assignment and Control System (FACS) are utilized to develop a probability which weights the cost of manual processing in the Loop Provisioning Center (LPC).

Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology

costs or replacement costs). Since LRIC is forward looking, it does *not* measure

historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS (cont.)

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. Study Assumptions

The cost factors used in this study are based on Economic Lives.

SWITCHED TRANSPORT FOR VOICE GRADE SERVICE

RECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's 1998 total long-run incremental costs for Voice Grade Switched Transport Service within the state of Arizona.

This study develops state wide average total long run incremental costs. Costs are stated on a per point of termination basis.

Voice Grade Switched Transport costs are provided for Voice Grade Entrance Facility and Direct-Trunked Transport.

B. DESCRIPTION OF SERVICE

The Switched Transport rate category provides the transmission facilities between the customer's premises and the end office switch(es) where the customer's traffic is switched to originate or terminate its communications. Voice Grade facilities are available for Entrance Facilities (EF) and for Direct-Trunked Transport (DTT) facilities. A Voice Grade facility is an electrical communications path which provides voice frequency transmission in the nominal frequency range of 300 to 3000Hz.
This cost study includes the costs for the following components:

a. Voice Grade Entrance Facility provides for the communications path between the Demarcation Point at the customer designated premises, and the Serving Wire Center of that premises. This is made up of the Network Access Channel (NAC) and Channel Performance costs. The Network Access Channel is comprised of two times the basic 2-wire facility (local subscriber loop and drop) and a portion of the central office Main Distributing Frame (MDF) that is used to make loop connections. The Voice Grade Service Channel Performance costs are optional channel functions that may be added to provide characteristics not included with the standard capabilities of the basic Network Access Channel. These functions are associated with transmission or service type bandwidth conversion, signaling, and amplification channel performance. Entrance Facility costs are developed as a cost per termination.

b. Direct-Trunked Transport consists of two elements; fixed costs and per mile costs. The fixed element contains the costs associated with the terminating equipment at both ends of the transmission path. The per mile costs contain the

costs associated with cable, repeaters, and intermediate central office equipment. The fixed costs are expressed per Voice Grade circuit and the per mile costs are expressed per Voice Grade circuit, per airline mile.

C. STUDY METHODOLOGY

U S WEST Communications (USWC) uses three cost models to calculate the long run incremental costs associated with its network, the Transport Model(TM), the Loop Module Model and Channel Transmission Equipment Calculator (CTEC) Model. These models calculate the incremental costs of essential network components. The Retail Cost Program calculates the incremental costs of network components based on investment input from these models.

The Loop Module model develops investments for the Network Access Channel (NAC). The model develops investments separately for feeder and distribution loop plant. The Loop Module also includes a unit investment file that includes the cost of each investment component. Detailed description of this model can be found in the Cost filing package under Model Descriptions.

The Interoffice Transport investments were calculated using the Transport Module (TM). TM calculates the weighted average installed investment required for transport over the U S WEST interoffice network. Weighted average investment is obtained by weighting the investments for various forward looking interoffice facility configurations by a state specific probability of occurrence. Detailed description of this model can be found in the Cost filing package under Model Descriptions.

U S WEST uses the Channel Transmission Equipment Calculator (CTEC) to calculate the Total Long Run Incremental investment for Switched Transport Service. The CTEC model contains several modules that calculate the Channel Performance and Optional Features and Functions investment.

The Retail Cost Program was used to convert installed investments to monthly costs by applying appropriate investment and expense factors to the installed investment.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a

product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

STUDY ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. It is assumed that facilities are placed given today's actual field conditions. This leads to a greater percent of facilities placement under difficult conditions than would occur with an assumption of "green field" (i.e., easy placement) conditions.

c.. All network investments are forward-looking:

- Transport equipment and facilities are digital.
- SONET is the forward looking technology in the interoffice network.
- Loop facilities include a least cost mix of loop technologies, including twisted pair copper and fiber optic facilities in the feeder plant, along with digital and analog pair gain equipment.

d. Additional assumptions used in the NAC, CTEC and Transport Models may be found in the documentation of the models.

MAIN, PREMIUM, AND PRIVACY LISTINGS

RECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the 1998 long-run incremental costs that U S WEST will incur for providing the Main Listings, Premium and Privacy Listings for Residence and Business in the fourteen state area.

This study develops statewide average long run incremental cost. Costs are stated per listing per month.

B. DESCRIPTION OF SERVICE

Main Listings - As a condition of the basic exchange service offering, subscribers receive in addition to dial tone a listing in the White Page Directory and in the Directory Assistance database. This listing contains essential information that allows users of the telephone network to determine the telephone number of a listed subscriber station, e.g., name address and telephone number.

Premium Listings - In addition to a main listing, a subscriber may choose to have listed any of the following types of listings, all considered to be Premium Listings, and all designed to give users of the telephone network more information than that which is contained in the main listings:

- Additional Listings: Listings provided in addition to the primary or main listing on a telephone service:

  * Business Service, e.g., name of an employee or another name by which the company is known.

  * Residence Service, e.g., name of another person living at the residence

- Reference Listings: Listings giving additional telephone numbers of the same or another subscriber to be called in the event there is no answer from the subscriber's telephone.

- Information Listings: Listings giving extra lines of information used in conjunction with other listings which contain information that is of benefit to the customer and to the customer's callers. This information must be non-promotional. e.g., "no solicitations."

- Secretarial Listings: Business listings for Direct Inward Dial (DID) service only for patrons who do not subscribe to local exchange service but terminate on Telephone Answering Services providing directory listings to their clients.

- Client Main/Resale/Shared Tenant Listings: Main listings provided to clients of reseller/shared tenant providers.

- Foreign Listings: Listings providing a community presence or visibility in another geographic area directory or Directory Assistance for a community not normally served by the customer's local telephone company.

- Interexchange Listings: Listings for Zenith or Enterprise numbers that allow customers to call an unpublished number toll free.

- WATS Listings: Foreign listings provided to 800 service customers in any community.

- Mobile Listings: Listings provided to Radio Common Carriers for mobile service patrons.

- Alternative Exchange Carrier (AEC) Listings: AEC's customer listing for directory assistance purposes.

Privacy Listings - Each subscriber to basic exchange service is provided both a main listing in the White Page Directory and in the Directory Assistance database unless the customer elects to subscribe to one of the following:

- Non-Listed Telephone Number Service: An arrangement by which the subscriber's telephone number appears on the Directory Assistance records but is omitted from the telephone directory as well as from all other listing products.

- Non-Published Telephone Number Service: An arrangement by which the subscriber's telephone number does not appear on either the Directory Assistance records or in the telephone directory and all other listing products.

C. STUDY METHODOLOGY

Main Listings - The annual expense per main listing was determined by dividing total projected expenses attributable to the provisioning of the main listings by the total number of main listings. Total annual expense consists of several elements which include data processing expense for information technology services, information services white page production expenses, and business office error correction expenses. Monthly expenses are determined by calculating the periodic payment of the annual expense over twelve (12 months). Expense based factors are then added to the monthly expense to provide total monthly costs. This study determines the cost of providing the main listing which is subsequently included in the cost support for basic exchange service.

Premium Listings - The annual expense per premium listing was determined by dividing total annual expenses attributable to the provisioning of the premium listings by the total number of listings. Total annual expense consists of several elements which include data processing expense for information technology services, information services white page production expenses, sales compensation, advertising and business office error correction expenses. Monthly expenses are determined by calculating the periodic payment of the annual expense over twelve (12 months). Expense based factors are then added to the monthly expense to calculate total monthly listing costs. The cost of a Premium Listing is considered incremental to the cost of basic exchange service and is not included in the cost support for basic exchange service.

Privacy Listings - The annual expense per privacy listing was determined by dividing total annual expenses attributable to the provisioning of the privacy listings by the total number of privacy listings. Total annual expense consists of several elements which include data processing expense for information technology services, information services white page production expenses, and business office error correction expenses. Monthly expenses are determined by calculating the periodic payment of the annual expense over twelve (12 months). Expense based factors are then added to the monthly expense to provide total monthly costs.

Privacy Listings are merely an enhanced version of a main listing. Since subscribers receive a listing as a condition of basic exchange service, the costs to provide privacy listings, which are used to support a separate rate element, include only the incremental costs to provide these listings. This incremental expense is determined by subtracting the expense of providing a main listing from the expense of providing a privacy listing. Inclusion of the expense of a main listing within the Privacy Listing expense support would lead to double counting of the expense incurred to provide the listing.

The costs incurred by service representatives when requests for a Premium or Privacy Listing are received and an order subsequently issued, e.g., service

representative time and common service order costs, are recovered by the non-recurring charges for the listings. The cost support for these non-recurring charges is provided under a separate tab.

Cost Elements - Several different cost elements were considered when the total annual costs were developed. The cost elements included:

1. Data Processing Expense - To collect, process, categorize, and store subscriber listings, the services of Information Technology Services are required, the cost of which must be included in the annual cost total. These costs are captured and identified via a charge back system called the Regional Charge Back System (RCBS) which tracks the units, e.g., CPU seconds, disk storage space, analyst time in hours, hardware, software, and support space, incurred on behalf of any department. The program then multiplies the number of units used by a value per unit to derive a number representing total costs. Specific codes for the listings product line permit specific costs to be identified, summed and included in the total costs for data processing. These costs are divided by total units to derive a cost per unit.

2. *White Pages Production, Labor and Other Expenses* - For all listing products, expenses are incurred in the Operator Information Services White Pages Production Group. These expenses include supervisory, clerical, methods and systems support and other related expenses incurred to ensure the continual maintenance of the Listing Service System (LSS) database via service order reject correction and business office interface. The number of employees involved in these job functions was divided by the total number of employees in the Operator Information Services work group to yield a ratio of employees performing these job functions. The ratio was multiplied against the 1995 budget commitment figures for the Operator Information Services group, to yield labor and other expenses. These total expenses are then prorated to products based on quantity of each type of listing

3. *Product Management* - U S WEST Communications dedicates people to product manage the service under study. This expense is calculated by taking the estimated time product management devotes to listing services and determining an annual amount using a directly assigned labor rate. Other direct expenses associated with the product management function are added to the labor expense to provide a total annual expense for product management. Costs are divided among the products based on the product management estimate of the percent of time spent on each product.

4. *Advertising* - Advertising expenses are included for the Premium

Listings services only.

5. *Land, Building and Office Equipment* - White Pages Production and system support personnel and equipment occupy building space, and use office equipment, work stations, and computers for provisioning of the service. The total dollar amount representing land, buildings, and office equipment is divided among the various services studied based on quantity of each type of listing.

- Land and Buildings: Total value is determined by multiplying total floor space occupied by the White Page Production group and support staff by the market value of the space on a per square foot basis provided by Business Resources, Inc..

- Work Stations: Total expense was determined by multiplying the costs of a typical work station: desk, bookshelves, chair, side chair, paneling, etc. by the number of people involved in the production system support group to derive a total cost. Since work stations are not replaced on an annual basis, monthly expenses are determined by calculating the periodic payment of the total expense over the expected life of the work station.

- Computer Hardware: Total expense was determined by multiplying an inventory of the computer equipment used by the White Page Production and support group by the respective retail value of the equipment to derive a total cost. Since personal computers are not replaced on an annual basis, monthly expenses are determined by calculating the periodic payment of the total expense over the 5 year expected life of the personal computer.

6. *Business Office Error Correction* - Although the service representative time and related expenses incurred for taking the orders are covered in the nonrecurring study, there is a specialized group of personnel in the business office whose time and related expenses can be attributed to listings. This personnel is responsible to field and research queries from the Business Office, the White Page Production group and from owners of the listings regarding White Page listings.

7. *Sales Compensation* - Cash awards paid to company employees for their sales efforts are considered incremental costs incurred on behalf of the services sold. Of the services included in this study, only Premium listings are subject to cash award sales compensation. For Residence the estimated amount of the cash awards was divided by all Residence Premium listings to calculate the cost per listing. For Business, a Sales Compensation factor was applied against the direct expense for the

product to produce the sales compensation expense associated with Business Premium listings.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs – Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

1. Each product is equally likely to be worked on by the groups generating land, building and office expenses.

2. The relative ratio of Operator Information Services employees to the total number of employees provides a reasonable estimate of the percent of expenses related to Operator Information Services. This is reasonable since those expenses are primarily labor-related rather than capital related and the relative wage rate for functions are similar.

3. 1995 level expenses remain constant through 1998.

DS1 SWITCHED TRANSPORT SERVICE

RECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the 1998 long-run incremental costs that would be incurred by U S WEST Communications to provide for the DS1 Transport components of Private Line Transport Service.

This study develops state wide average Long Run Incremental Costs (LRIC). Costs are specific to the state of ARIZONA and are stated on a per DS1 basis, unless specified otherwise.

B. DESCRIPTION OF SERVICE

U S WEST DS1 Service is a high capacity, high performance information pipeline that is designed to transport isochronous serial data at 1.544 megabits per second (M/bits) and has the capacity of 24 voice equivalent channels. DS1 facilities are available for Channel Termination and Interoffice Transport facilities. DS1 Service is available utilizing an Electrical Interface.

The basic rate categories addressed in this study which apply to U S WEST DS1 Transport service are:

- DS1 Interoffice Transport
- DS1 Entrance Facility
- DS1 to DSO Multiplexing

Interoffice Transport : Consists of two elements; fixed costs and per mile costs. The fixed element contains the costs associated with the terminating equipment at both ends of the transmission path. The per mile costs contain the costs associated with cable, repeaters, and intermediate central office equipment. The fixed costs are expressed per DS1 circuit and the per mile costs are expressed per DS1 circuit, per airline mile. For purposes of determining the per-mile rate, mileage is measured using the V & H coordinates method.

DS1 Entrance Facility: Provides for the communications path between the Demarcation Point at the customer designated premises and its Serving Wire Center. The cost includes the weighted copper and fiber facility and supporting structure, transmission and terminating equipment at the serving wire center and customer premises. Entrance Facility costs are developed as a weighted average cost per DS1 terminated at the Demarcation Point.

DS1 to DSO Multiplexing: Central Office Multiplexing includes the equipment necessary for an arrangement that converts a DS1 channel to 24 DSO channels utilizing time division multiplexing.

C. STUDY METHODOLOGY

Interoffice Transport - The Interoffice Transport investments were calculated using the Transport Module (TM). TM calculates the weighted average installed investment required for transport over the U S WEST interoffice network. Weighted average investment is obtained by weighting the investments for various forward looking interoffice facility configurations by a state specific probability of occurrence.

DS1 Entrance Facility - investments are calculated using a Microsoft EXCEL based model called the NAC (Network Access Channel) model. The NAC model estimates the forward looking installed investment associated with DS1 circuits between a serving central office and an end user location.

DS1 to DSO Multiplexing - The installed investments for the Central Office Multiplex Option were calculated based on the required equipment specified by Network Standard Configurations.

There is no advertising included in this study since this element is not advertised nor offered separately from the private line transport service of which this element is a part.

The Windows Personal Cost Calculator (WINPC3) was used to convert installed investments to LRIC monthly costs by applying appropriate Investment and Expense factors to the installed investment.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does not measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs

of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Directly Attributable Costs – Directly attributable costs are costs that vary relative to a group or family of services, however, the variability is not directly dependent upon the service family, but rather on groups of product families. Although there is a cost causative relationship between the services and these costs, it is not directly a function of any service category. These costs are volume sensitive, however, they cannot be completely avoided based on the elimination of any specific service or service family.

Total Direct plus Network Support plus Directly Attributable Costs -- Are the sum of the forward-looking costs incurred for a service. They are the sum of Total Direct Costs, Network Support Costs associated with a service, and Directly Attributable Costs.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

STUDY ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. It is assumed that facilities are placed given today's actual field conditions. This leads

to a greater percent of facilities placement under difficult conditions than would occur with an assumption of "green field" (i.e., easy placement) conditions.

c. Costs do not reflect the emergence of widespread competition in the local exchange market.

d. All network investments are forward-looking:

i. Transport equipment and facilities are digital.

ii. SONET is the forward looking technology in the interoffice network.

iii. Loop facilities include a least cost mix of loop technologies, including copper and fiber optic facilities .

e. Model assumptions used in the NAC and Transport calculations may be found in the documentation of those models.

ADDITIONAL ENGINEERING, LABOR, TESTING, DATE AND DESIGN NONRECURRING COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

This study estimates forward-looking nonrecurring long run incremental costs U S WEST will incur to provide Additional Engineering, Labor, Testing, Date and Design Change services. The study results represent direct 1998 costs. The results of this study may be used for pricing and other management decisions.

B. DESCRIPTION OF SERVICE

Additional Engineering, Labor, Testing is incurred by the Company for additional time associated with engineering (additional technical information already provided), labor (incurred to accommodate a specific customer request or overtime), maintenance (trouble report with no trouble found in company facilities) or testing (not performed during the installation of service). The cost is per each half hour or per month, as appropriate.

A customer may request a **Date Change** to an existing order any time prior to notification by the telephone company that service is available for use. When the customer indicates that service cannot be accepted on the service date, the company accordingly delays the start of service and a Service Date Change Charge will apply. The cost is per order per occurrence.

Design Change is incurred by the Company to review the original service design and make the changes necessary to meet a customer request. Design changes include such things as a change of end user premises within the same serving wirecenter, the addition or deletion of optional features, functions, BSE's or a change in the type of transport termination, type of channel interface, interface group or technical specifications package. The cost is per order per occurrence.

C. STUDY METHODOLOGY

Nonrecurring costs represent the one-time charges that apply for specific work activities. We study the provisioning activities involved in providing a service in order to develop the Nonrecurring cost. Following is a description of the required

cost inputs:

Time Estimates
The time estimate is the average amount of time required to perform a particular work function.

Probabilities
A probability is the percent of time a particular work function is performed for a particular service offering. Probabilities were developed from reports and by field experts.

Expense Factors
The program applies expense factors to the direct cost. The factors include Business Fees and assignable Administrative Expense.

Labor Rates
Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the U S WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., motor vehicle expense, general purpose tools, etc.)

NONRECURRING COST PROGRAM

The Nonrecurring Cost Program (NRC) performs the mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Total Service Long Run Incremental (TSLRIC) results.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

COIN LINE SERVICE
RECURRING AND NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the U S WEST's 1998 total service Long Run Incremental Costs for Coin Line Service within the state of Arizona.

This study develops deaveraged recurring and non recurring long run incremental costs. Recurring costs are stated on a per line and measured/message and a flat basis. Non recurring costs represent the estimated one-time costs to install and disconnect service. They reflect the changing technologies and mechanization in the provisioning of Coin Line Service.

B. DESCRIPTION OF SERVICE

Coin Line Service is a voice grade telephone service which provides exchange access from the subscriber's premises to the U S WEST central office facilities for the purpose of connecting Customer Owned Pay Telephones, (COPT), which utilize central office coin control features. Coin Line Service is distinguished from Public Access Line Service, (PAL), service as follows: PAL Service allows vendor customers a line on which they terminate a "smart" coin phone. Coin Line service allows vendor customers a line on which they have the ability to terminate a "dumb" telephone set on the line by utilizing central office based payphone functions.

These additional functions include:

- Monitoring for coin deposits.
- Controlling the voltage which either collects or returns the deposited coins.
- On toll calls, coin deposits are monitored through the DTMF (Dual Tone Multifrequency) signals.

C. STUDY METHODOLOGY

RECURRING COSTS: The major cost components of Coin Line Service on a recurring basis are the following: The subscriber loop, the drop or service wire, the non-traffic sensitive portion of the central office (NTS-COE), billing and collection for a business line,

directory listing, and local usage costs. Costs associated with operator non-assistance including Automated Coin Telephone Service (ACTS) are combined with central office functions specific to coin service and are also included. Local usage costs include end office switching, tandem switching, measurement, interoffice transport, local measured service billing and collection, intercept, operator assistance, and measurement polling expense.

Following is a description of these components:

1. The subscriber loop is comprised of those outside plant and circuit facilities extending from the central office switch to and including the customer serving terminal. The drop or service wire includes the cost of wire facilities between the customer's serving outside plant terminal and customer's service location. The Loop Module Program is used to determine the loop and drop investments. The program models investments for wire center size groups and calculates the investment for a census of loops (customer locations).

2. Non-traffic sensitive central office equipment associated with the connection of the access line to the central office switch is sensitive to the number of lines served by the central office, but not to the amount of traffic (usage) going through the office. NTS-COE investments are developed in the Switching Usage Model by weighting the investments from different types of forward-looking digital central office switches by the number of working lines in each office.

3. Billing and collection costs identify the costs associated with the preparation, rendering, and collection of bills. The Customer Record Information System (CRIS) Billing and Collection investment model is used to develop estimates of billing and collecting (B&C) investments for a business line and for local measured service messages. The model identifies investments for three primary components: 1.) customer contact labor, which identifies the cost related primarily to business office functions, 2.) Centralized Data Processing (CDP) , and 3.) the investment associated with CRIS.

4. The directory listing cost identifies the cost of providing a listing in the white pages directory as well as a listing in the directory assistance database. Expenses used to develop these costs consist of several elements, including data processing expense for Information Technology Services (ITS), Information Services White Page production expenses, and business office error correction expenses. The expense per main listing is determined by dividing total expenses attributable to the provisioning of the main listings by the total number of main listings.

5. Non-Operator Assistance costs include Automated Coin Telephone Service, (ACTS) and other operator costs not included with the operator assistance expenses which are included within the Local Usage Cost portion of the study. These costs include traffic requiring OSS support. This traffic is routed to the Operator Position System. The system will, if possible, perform the needed validation and call identification for

billing purposes without operator intervention. These are commonly called machine handled calls.

6. The Central Office Equipment costs are those costs associated with certain central office based functions. These functions include coin collect and return functions as well as announcement capabilities. The required equipment associated with these functions vary with switch type. Only digital switch types are included within the analysis. Specific equipment items included within this portion of the study include:

   Ericsson Switches: Coin magazines which control coin collect and return functions and announcement equipment which provides an instructional announcement for the payphone user.

   5ESS Switches : Announcement and trunk equipment to provide instructional announcements as well as coin collect and control functions.

   DMS 10 and DMS 100 Switches: Announcement, 48 volt coin collect and control functions, and B-Line card incremental costs required with these switch types.

   Investments used to calculate these costs are provided by Network Switching engineers. The investments are those identified for a typical central office representative of the study jurisdiction.

Note: The cost study combines those expenses and investments associated with Non-Operator Assistance and Central Office Equipment Specific to Coin Line, and develops one combined cost for these functions.

7. Local usage costs identify the traffic sensitive network components required to provide the communication path from the serving wire center where the local call originates to the serving wire center where the call terminates.

   The Switching Usage Model calculates the intraoffice and interoffice call set-up and conversation minute unit investments associated with switching and measuring in end offices. The model also calculates the investment of tandem switching for interoffice calls and conversation minutes. The Transport Model calculates the call set-up and conversation minute unit investments associated with transporting calls over the USWC interoffice network. The network component investments include Signaling System 7 (SS7) technology.

   These network component investments, along with additional expenses, i.e., local measured service billing and collection, intercept, operator assistance, and measurement polling expenses are then multiplied by quantities required for Coin Line local service.

   Intercept expense includes limited mechanical announcements informing callers of

new numbers, referral numbers, and / or line status. The total non chargeable intercept expenses are divided by total annual messages to develop the non chargeable intercept expense per message. The expenses include equipment, facilities, transport, and local switching.

Operator assistance investments and expenses identify the miscellaneous operator support such as dialing instructions and connections to directory assistance. The Operator Services Cost Analysis Program (OSCAP) is used to calculate the incremental forward looking investment of an Operator Services System (OSS) processed call. The program calculates the differential for either machine handled (MAH) or operator handled (OPH) calls compared to a Direct Distance Dialed (DDD) call.

The total messages and minutes of use are from the Switching Usage Model. The Switching Usage Model calculates the investment of end office switching and minutes of use for intra-office and inter-office calls. The assistance calls are multiplied by their specific investment per call to develop a total investment for assistance calls. The total investment is then divided by the total messages.

Measurement polling expense identifies the teleprocessing measurement investments. The investments for this study are state average investments based on the total annual investments for the end office polling equipment and software for the state and the total projected usage that represents an annual levelized usage figure for the state. The investments for the host collector location are based on the total annual costs for the equipment and software required to supervise and monitor end offices of a particular region and the total levelized usage that is polled for that region. The investments for the host collector location are developed as an investment per message and are included in the final investment per message for each state in the region.

Coin Line costs by service are developed by first accumulating the various investments for separate cost components and combining them with other miscellaneous inputs to calculate an investment for each component. After investments are identified by component, the components are combined to yield investments by Coin Line product or service type.

The study work papers, which are identified as Tab C within the study binder, include a series of spread sheets which can be identified as the Excel file: AZPALCNL. The investments are developed within this file. Following is a summary of the different sections of these investment files:

I. INPUTS: The inputs section includes the following investments and other miscellaneous data:

A. The name of the state studied and dates of model runs used to identify investments.

B. Loop investments by account code and by rate area or zone.

C. Switching Unit Investments by account code. The investments are acquired from the Switched Usage Model (SUM). The SUM model calculates the investments associated with switching and measuring calls in the end office and tandem switches.

D. Transport Unit Investments by account code. These investments are acquired from the Transport Model (TM). The TM calculates investments associated with transporting calls over the USWC interoffice network.

E. Call Rates, Call Durations, and the list of specific products studied.

F. Usage Assumptions and state specific miscellaneous data is also inputted into this section. This data includes the following:

(1). The number of end offices required for intraoffice and interoffice calls, as well as the number of measurement offices required for measured calls.

(2). Percentages used to identify intraoffice versus interoffice calling characteristics, as well as the percent of local calls through a tandem office.

(3). The average transport distance, in miles, relative to an interoffice call is inputted into this section as well as non-traffic sensitive investments to calculate NTSCOE costs.

(4). Other investments and direct expenses including:
Billing and Collections, Directory Listings, Intercept, Measurement **Polling, and Operator Assistance.**

The study also combines those expenses and investments associated with Non- Operator Assistance and Central Office Equipment Specific to Coinline, and develops one combined cost for these functions.

I. SWITCHING: End office switching, measurement, and tandem switching investments and expenses are calculated by account and as set-up and per conversation minute investments within this section. The program identifies the number of end offices required for an interoffice call, an intraoffice call, and the number of measurement offices required for a measured call. Set-up and conversation minute investments acquired from the inputs are multiplied by the appropriate required end office factor, (i.e.: 1 or 2). End office investments for intraoffice local calling and end office investments for interoffice local calling are then weighted together using percentages of local intraoffice traffic and percentages of local interoffice traffic within the state as weighting percentages. The result is a total weighted end office investment. Tandem investments appropriate to local calling are determined by multiplying total unit tandem investments by a percent of all local traffic through a tandem switch.

II. TRANSPORT: A conversion of Transport Model investment output to investments appropriate for local exchange service occurs within this section. Both interoffice facility and termination investments are calculated. Facility investment is calculated by acquiring the set-up and conversation minute

investment by account from the Transport Model. The investment is then multiplied by an average distance, in miles, of a local call to acquire a unit investment per call set-up and per conversation minute. The results are then multiplied by a percent of local calls that are interoffice to arrive at a weighted facility investment per call set-up and per conversation minute. Termination investment is calculated by acquiring unit investment per call set-up and conversation minute from the Transport Model. These values are multiplied by a percent of local calls that are interoffice to arrive at a weighted termination investment per call set-up and per conversation minute. The resulting weighted cost is then multiplied by 1+the percent of local interoffice traffic through a tandem. This latter calculation is completed to add in the termination investment relative to local interoffice calling through a tandem. The final result is a weighted termination investment per call set-up and per conversation minute.

III. SET-UP AND CONVERSATION MINUTE USAGE INVESTMENTS

Investments and direct expenses calculated in Section II and III are combined with operator assistance, LMS billing and collection, intercept, and measurement polling investments and expenses to yield the following set-up and conversation minute cost components:

1. Measured Residence Usage – Set-up
2. Measured Residence Usage – Conversation Minute
3. Business Measured Usage – Set-up
4. Business Measured Usage – Conversation Minute
5. Flat Rate Business and Residence Usage – Set-up
6. Flat Rate Business and Residence Usage – Conversation Minute

I. USAGE INVESTMENTS AND EXPENSES BY SERVICE TYPE

The appropriate set-up and conversation minute usage investments developed in Section IV are then combined with monthly per line call rates and call durations to calculate monthly per line local usage investments for each service being studied. Call rates and call durations used in this development are provided by a manual call usage study.

II. SUMMARY BY SERVICE TYPE

The usage investments and expenses calculated by service type in Section V are combined with other per line investments (i.e.: Loop, NTSCOE, Billing and Collection, and Directory Listing) to provide a total investment by component and for total service studied.

Each investment by account code, service and also by each component, are entered into the Retail Cost Program to calculate costs for each service. The program applies the appropriate annual cost factors for the jurisdiction and services being studied. These costs include:

(1). **Investment Based monthly Direct Costs:** depreciation, cost of money, income tax expense, maintenance, right to use, ad valorem tax.

(2). **Land and Building costs.**
(3). **Commercial Costs by Product Group:** Product Management, Sales Expense, Product Advertising Expense, and Business Fees.
(4). **Network Support:** Network Operations and Network Support Assets.

Recurring costs are displayed by product, cost component, and by rate zone where appropriate.

NON RECURRING COSTS: Following is a brief explanation of the methodology used to develop the non recurring costs for Coin Line Service:

Nonrecurring costs represent the one-time charges that apply for specific work activities involved in providing Coin Line Service. The Non recurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors.

1. Regional negotiation times are used to develop the costs. Time estimates are obtained from field experts who actually perform the work being studied and / or from subject matter experts on staff representing the work group.
2. Company objectives for Dedicated Inside Plant (DIP) for the central office frame are used to develop a probability which weights the cost of placing and removing jumpers when a line is established or removed.
3. Company objectives for the flow through percentages for the Facility Assignment and Control System (FACS) are utilized to develop a probability which weights the costs of manual processing in the Loop Provisioning Center (LPC).
4. Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does not measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into

the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

E. STUDY ASSUMPTIONS

A. ARIZONA RATE ZONE CREATION:

The following assumptions were used to create the three rate zones for Arizona using the IFT Data Base. The IFT Data Base identifies the number of working lines for each wire center.

Inside The Base Rate Area: The IFT Data Base was used to determine the percentage of working lines Inside The Base Rate Area (IBRA). This percentage was used to determine the kilofoot crossover boundary between IBRA and Zone 1 by wire center group. This crossover point represented the IBRA boundary before the zone was expanded. In order to account for the IBRA expansion, Public Policy determined the new IBRA areas by Wire Center and these areas were compared to the old IBRA areas. The difference between the new IBRA areas and the old was converted to a Kilofoot distance, and this distance was added to the original crossover point, delineating the new IBRA boundary.

Zone 1: Zone 1 extends for a mile beyond the IBRA Zone.

Zone 2: Zone 2 extends from the cut off for Zone 1 to 100 kilofeet from the Central Office.

B. Costs do not reflect the emergence of widespread competition in the local exchange market.

C. All network investments are forward-looking:

i. Switching and transport equipment and facilities are digital.
ii. SONET is the forward looking technology in the interoffice network.
iii. Loop facilities include a least cost mix of loop technologies, including twisted pair copper and fiber optic facilities in the feeder plant, along with digital and analog pair gain equipment.

D. The loop and drop investments in this study are based on weighting together loop samples from all classes of service to produce a statewide average investment per loop. Product group factors are applied to this investment to develop a service specific loop and drop cost.

PUBLIC ACCESS LINE SERVICE
RECURRING AND NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the U S WEST's 1998 total service Long Run Incremental Costs for Public Access Line Service within the state of Arizona.

This study develops deaveraged recurring and non recurring long run incremental costs. Recurring costs are stated on a per line and on a measured/message and a flat basis. Non recurring costs represent the estimated one-time costs to install and disconnect service. They reflect the changing technologies and mechanization in the provisioning of Public Access Line Service.

B. DESCRIPTION OF SERVICE

Public Access Line (PAL) Service is provided for use with customer-owned coin / coinless telephones at locations accessible to the public. Customer-Owned Coin Operated Telephones (COCOT) vendors / agents who wish to connect their own hardware to the exchange network, for public use, are required to subscribe to PAL service, using an FCC-registered instrument. Access is then provided to the local / toll network.
Coin Line Service is distinguished from Public Access Line Service, (PAL), service as follows: PAL Service allows vendor customers a line on which they terminate a "smart" coin phone. Coin Line service allows vendor customers a line on which they have the ability to terminate a "dumb" telephone set on the line by utilizing central office based payphone functions.

C. STUDY METHODOLOGY

RECURRING COSTS: The major cost components of PAL Service on a recurring basis are the following: The subscriber loop, the drop or service wire, the non-traffic sensitive portion of the central office (NTS-COE), billing and collection for a business line, directory listing, and local usage costs. Local usage costs include end office switching, tandem switching, measurement, interoffice transport, local measured service billing and collection, intercept, operator assistance, and measurement polling expense.

Following is a description of these components:

1. The subscriber loop is comprised of those outside plant and circuit facilities extending from the central office switch to and including the customer serving terminal. The drop or service wire includes the cost of wire facilities between the customer's serving outside plant terminal and customer's service location. The Loop Module Program is used to determine the loop and drop investments. The program models investments for wire center size groups and calculates the investment for a census of loops (customer locations).

2. Non-traffic sensitive central office equipment associated with the connection of the access line to the central office switch is sensitive to the number of lines served by the central office, but not to the amount of traffic (usage) going through the office. NTS-COE investments are developed in the Switching Usage Model by weighting the investments from different types of forward-looking digital central office switches by the number of working lines in each office.

3. Billing and collection costs identify the costs associated with the preparation, rendering, and collection of bills. The Customer Record Information System (CRIS) Billing and Collection investment model is used to develop estimates of billing and collecting (B&C) investments for a business line and for local measured service messages. The model identifies investments for three primary components: 1.) customer contact labor, which identifies the cost related primarily to business office functions, 2.) Centralized Data Processing (CDP) , and 3.) the investment associated with CRIS.

4. The directory listing cost identifies the cost of providing a listing in the white pages directory as well as a listing in the directory assistance database. Expenses used to develop these costs consist of several elements, including data processing expense for Information Technology Services (ITS), Information Services White Page production expenses, and business office error correction expenses. The expense per main listing is determined by dividing total expenses attributable to the provisioning of the main listings by the total number of main listings.

5. Local usage costs identify the traffic sensitive network components required to provide the communication path from the serving wire center where the local call originates to the serving wire center where the call terminates.

   The Switching Usage Model calculates the intraoffice and interoffice call set-up and conversation minute unit investments associated with switching and measuring in end offices. The model also calculates the investment of tandem switching for interoffice calls and conversation minutes. The Transport Model calculates the call set-up and conversation minute unit investments associated with transporting calls over the USWC interoffice network. The network component investments include Signaling System 7 (SS7) technology.

These network component investments, along with additional expenses, i.e., local measured service billing and collection, intercept, operator assistance, and measurement polling expenses are then multiplied by quantities required for Public Access Line local service.

Intercept expense includes limited mechanical announcements informing callers of new numbers, referral numbers, and / or line status. The total non chargeable intercept expenses are divided by total annual messages to develop the non chargeable intercept expense per message. The expenses include equipment, facilities, transport, and local switching.

Operator assistance investments and expenses identify the miscellaneous operator support such as dialing instructions and connections to directory assistance. The Operator Services Cost Analysis Program (OSCAP) is used to calculate the incremental forward looking investment of an Operator Services System (OSS) processed call. The program calculates the differential for either machine handled (MAH) or operator handled (OPH) calls compared to a Direct Distance Dialed (DDD) call.

The total messages and minutes of use are from the Switching Usage Model. The Switching Usage Model calculates the investment of end office switching and minutes of use for intra-office and inter-office calls. The assistance calls are multiplied by their specific investment per call to develop a total investment for assistance calls. The total investment is then divided by the total messages.

Measurement polling expense identifies the teleprocessing measurement investments. The investments for this study are state average investments based on the total annual investments for the end office polling equipment and software for the state and the total projected usage that represents an annual levelized usage figure for the state. The investments for the host collector location are based on the total annual costs for the equipment and software required to supervise and monitor end offices of a particular region and the total levelized usage that is polled for that region. The investments for the host collector location are developed as an investment per message and are included in the final investment per message for each state in the region.

Public Access Line costs are developed by first accumulating the various investments for separate cost components and combining them with other miscellaneous inputs to calculate an investment for each component. After investments are identified by component, the components are combined to yield investments by PAL product or service type.

The study work papers, which are identified as Tab C within the study binder, include a series of spread sheets which can be identified as the Excel file: AZPALCNL. The investments are developed within this file. Following is a summary of the different sections of these investment files:

I. INPUTS: The inputs section includes the following investments and other miscellaneous data:

A. The name of the state studied and dates of model runs used to identify investments.

B. Loop investments by account code and by rate area or zone.

C. Switching Unit Investments by account code. The investments are acquired from the Switched Usage Model (SUM). The SUM model calculates the investments associated with switching and measuring calls in the end office and tandem switches.

D. Transport Unit Investments by account code. These investments are acquired from the Transport Model (TM). The TM calculates investments associated with transporting calls over the USWC interoffice network.

E. Call Rates, Call Durations, and the list of specific products studied.

F. Usage Assumptions and state specific miscellaneous data is also inputted into this section. This data includes the following:

(1). The number of end offices required for intraoffice and interoffice calls, as well as the number of measurement offices required for measured calls.

(2). Percentages used to identify intraoffice versus interoffice calling characteristics, as well as the percent of local calls through a tandem office.

(3). The average transport distance, in miles, relative to an interoffice call is inputted into this section as well as non-traffic sensitive investments to calculate NTSCOE costs.

(4). Other investments and direct expenses including:
Billing and Collections, Directory Listings, Intercept, Measurement **Polling, and Operator Assistance.**

I. SWITCHING: End office switching, measurement, and tandem switching investments and expenses are calculated by account and as set-up and per conversation minute investments within this section. The program identifies the number of end offices required for an interoffice call, an intraoffice call, and the number of measurement offices required for a measured call. Set-up and conversation minute investments acquired from the inputs are multiplied by the appropriate required end office factor, (i.e.: 1 or 2). End office investments for intraoffice local calling and end office investments for interoffice local calling are then weighted together using percentages of local intraoffice traffic and percentages of local interoffice traffic within the state as weighting percentages. The result is a total weighted end office investment. Tandem investments appropriate to local calling are determined by multiplying total unit tandem investments by a percent of all local traffic through a tandem switch.

II. TRANSPORT: A conversion of Transport Model investment output to

investments appropriate for local exchange service occurs within this section. Both interoffice facility and termination investments are calculated. Facility investment is calculated by acquiring the set-up and conversation minute investment by account from the Transport Model. The investment is then multiplied by an average distance, in miles, of a local call to acquire a unit investment per call set-up and per conversation minute. The results are then multiplied by a percent of local calls that are interoffice to arrive at a weighted facility investment per call set-up and per conversation minute. Termination investment is calculated by acquiring unit investment per call set-up and conversation minute from the Transport Model. These values are multiplied by a percent of local calls that are interoffice to arrive at a weighted termination investment per call set-up and per conversation minute. The resulting weighted cost is then multiplied by 1+the percent of local interoffice traffic through a tandem. This latter calculation is completed to add in the termination investment relative to local interoffice calling through a tandem. The final result is a weighted termination investment per call set-up and per conversation minute.

III. SET-UP AND CONVERSATION MINUTE USAGE INVESTMENTS

Investments and direct expenses calculated in Section II and III are combined with operator assistance, LMS billing and collection, intercept, and measurement polling investments and expenses to yield the following set-up and conversation minute cost components:

1. Measured Residence Usage – Set-up
2. Measured Residence Usage – Conversation Minute
3. Business Measured Usage – Set-up
4. Business Measured Usage – Conversation Minute
5. Flat Rate Business and Residence Usage – Set-up
6. Flat Rate Business and Residence Usage – Conversation Minute

I. USAGE INVESTMENTS AND EXPENSES BY SERVICE TYPE

The appropriate set-up and conversation minute usage investments developed in Section IV are then combined with monthly per line call rates and call durations to calculate monthly per line local usage investments for each service being studied. Call rates and call durations used in this development are provided by a manual call usage study.

II. SUMMARY BY SERVICE TYPE

The usage investments and expenses calculated by service type in Section V are combined with other per line investments (i.e.: Loop, NTSCOE, Billing and Collection, and Directory Listing) to provide a total investment by component and for total service studied.

Each investment by account code, service and also by each component, are entered into the Retail Cost Program to calculate costs for each service. The program applies the

appropriate annual cost factors for the jurisdiction and services being studied. These costs include:

(1). **Investment Based monthly Direct Costs:** depreciation, cost of money, income tax expense, maintenance, right to use, ad valorem tax.
(2). **Land and Building costs.**
(3). **Commercial Costs by Product Group:** Product Management, Sales Expense, Product Advertising Expense, and Business Fees.
(4). **Network Support:** Network Operations and Network Support Assets.

Recurring costs are displayed by product, cost component, and by rate zone where appropriate.

NON RECURRING COSTS: Following is a brief explanation of the methodology used to develop the non recurring costs for Coin Line Service:

Nonrecurring costs represent the one-time charges that apply for specific work activities involved in providing PAL Service. The Non recurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors.

1. Regional negotiation times are used to develop the costs. Time estimates are obtained from field experts who actually perform the work being studied and / or from subject matter experts on staff representing the work group.
2. Company objectives for Dedicated Inside Plant (DIP) for the central office frame are used to develop a probability which weights the cost of placing and removing jumpers when a line is established or removed.
3. Company objectives for the flow through percentages for the Facility Assignment and Control System (FACS) are utilized to develop a probability which weights the costs of manual processing in the Loop Provisioning Center (LPC).
4. Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement

costs). Since LRIC is forward looking, it does not measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

E. STUDY ASSUMPTIONS

A. ARIZONA RATE ZONE CREATION:

The following assumptions were used to create the three rate zones for Arizona using the IFT Data Base. The IFT Data Base identifies the number of working lines for each wire center.

Inside The Base Rate Area: The IFT Data Base was used to determine the percentage of working lines Inside The Base Rate Area (IBRA). This percentage was used to determine the kilofoot crossover boundary between IBRA and Zone 1 by wire center group. This crossover point represented the IBRA boundary before the zone was expanded. In order to account for the IBRA expansion, Public Policy determined the new IBRA areas by Wire Center and these areas were compared to the old IBRA areas. The difference between the new IBRA areas and the old was converted to a Kilofoot distance, and this distance was added to the original crossover point, delineating the new IBRA boundary.

Zone 1: Zone 1 extends for a mile beyond the IBRA Zone.

Zone 2: Zone 2 extends from the cut off for Zone 1 to 100 kilofeet from the Central Office.

B. Costs do not reflect the emergence of widespread competition in the local exchange market.

C. All network investments are forward-looking:

   i. Switching and transport equipment and facilities are digital.
   ii. SONET is the forward looking technology in the interoffice network.
   iii. Loop facilities include a least cost mix of loop technologies, including twisted pair copper and fiber optic facilities in the feeder plant, along with digital and analog pair gain equipment.

D. The loop and drop investments in this study are based on weighting together loop samples from all classes of service to produce a statewide average investment per loop. Product group factors are applied to this investment to develop a service specific loop and drop cost.

CUSTOM LOCAL AREA SIGNALING SERVICE

RECURRING AND NONRECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's long run incremental costs it will incur to provide Custom Local Area Signaling Services (CLASS) features in the State of Arizona.

This study develops for U S WEST, in Arizona, average long run incremental costs. Costs are stated on a service element basis.

B. DESCRIPTION OF SERVICE

This cost study includes the costs for the following CLASS features:

Anonymous Call Rejection
Call Waiting ID
Calling Name Delivery
Calling Number Delivery
Calling Number Delivery Blocking
Continuous Redial
Last Call Return
Priority Calling
Selective Call Forwarding
Selective Call Rejection

C. STUDY METHODOLOGY

RECURRING

The costs that are identified are direct costs that occur as a result of providing CLASS. These include digital central office switch costs in the subscriber's serving wire center.

Central office switching feature costs are calculated by first determining incremental switching feature investments. These feature investments are obtained through the use of the U S WEST Communications Inc. (USWC), Switching Cost Model (SCM) for digital stored program controlled central offices. A detailed description of this program is provided in the work papers.

The switch investments include processor time, memory and hardware appropriate for each feature. The investments are converted to monthly costs using monthly cost factors, e.g. land and building, which are applied through the use of the Windows Personal Cost

Calculator (WINPC3) cost program.

The WINPC3 model develops Long Run Incremental Costs (LRIC) from investments and/or expenses associated with U S WEST products and services. A detailed description of this program is provided in the work papers.

The investments are converted to monthly costs using monthly cost factors, which are represented as investment based and expense based. Investment based factors include as an example, Capital, Ad Valorem taxes, and etc. Capital costs consist of depreciation, income tax and cost of money. Expense based factors could include as an example, administration, business fee taxes and etc.

NONRECURRING

Nonrecurring costs represent the one-time costs that apply for specific work activities to install and disconnect service. We study the various activities involved in providing the service in order to develop the nonrecurring cost. Following is a description of the required data inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained from field experts who actually perform the work being studied and/or Subject Matter Experts on staff representing the work group.

Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historic investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs varies directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS (con't)

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

1. All costs displayed are represented on a per line basis.

2. Recurring costs are weighted between two switch types.

TOLL RESTRICTION/SCREENING
RECURRING AND NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's long run incremental costs it will incur to provide Toll Restriction/Screening services in the State of Arizona.

This study develops for U S WEST, in Arizona, average long run incremental costs. Costs are stated on a service element basis.

B. DESCRIPTION OF SERVICE

Toll Restriction provides for individual exchange access lines or trunks to be restricted from dialing billable toll calls. The access line is equipped with Toll Restriction to disallow originating access to the toll network. Local directory assistance calls are allowed. Attempted violation of the restriction is routed to an announcement. Toll Restriction may include Billed Number Screening. Additional services or products supported by this study are:

Pay-per- Use Restriction (976, 970)
International Toll Blocking
Selective Class of Call Screening

C. STUDY METHODOLOGY

RECURRING

The costs that are identified are direct costs that occur as a result of providing restriction/screening. These include digital central office switch costs in the subscriber's serving wire center.

Central office switching feature costs are calculated by first determining incremental switching feature investments. These feature investments are obtained through the use of the U S WEST Communications Inc. (USWC), Switching Cost Model (SCM) for digital stored program controlled central offices. A detailed description of this program is provided in the work papers.

The switch investments include processor time, memory and hardware appropriate for each feature. The investments are converted to monthly costs using monthly cost factors, e.g. land and building, which are applied through the use of the Windows Personal Cost Calculator (WINPC3) cost program.

The WINPC3 model develops Long Run Incremental Costs (LRIC) from investments and/or expenses associated with U S WEST products and services. A detailed description

of this program is provided in the work papers.

C. STUDY METHODOLOGY (Continued)

The investments are converted to monthly costs using monthly cost factors, which are represented as investment based and expense based. Investment based factors include as an example, Capital, Ad Valorem taxes, and etc. Capital costs consist of depreciation, income tax and cost of money. Expense based factors could include as an example, administration, business fee taxes and etc.

NONRECURRING

Nonrecurring costs represent the one-time costs that apply for specific work activities to install and disconnect service. We study the various activities involved in providing the service in order to develop the nonrecurring cost. Following is a description of the required data inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained from field experts who actually perform the work being studied and/or Subject Matter

Experts on staff representing the work group.

Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historic investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs varies directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

1. All costs displayed are represented on a per line basis.

2. Recurring costs are weighted between three switch types.

CUSTOMNET SERVICE
RECURRING AND NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's long run incremental costs it will incur to provide CUSTOMNET service in the State of Arizona.

This study develops for U S WEST, in Arizona, average long run incremental costs. Costs are stated on a service element basis.

B. DESCRIPTION OF SERVICE

CUSTOMNET Service provides toll access screening options that allow a customer to restrict the classes of chargeable calls originating over some or all of their lines. CUSTOMNET Services enables a customer, by means of Company operator identification, to provide toll access but restrict (0/0+) outgoing toll calls to only those calls which are charged to the called telephone (collect), a third number, and/or calling card.

Individual Line Service is available with two options:

Option 1
All local and nonchargeable calls, e.g., calls to 800/800-type service numbers, and calls to Company numbers such as repair and public emergency service numbers (such as 911) will be permitted. Calls dialed 1+, including calls to Directory Assistance, will not be permitted. Calls dialed 0/0+ to Directory Assistance will be permitted if alternate billing is provided.

Option 2
All calls, nonchargeable calls and calls dialed 1+ will be permitted. With this option, the customer assumes responsibility for all calls dialed 1+ and indemnifies and saves the Company harmless against claims resulting from fraudulent use of the service.

CUSTOMNET is furnished where facilities and operating conditions permit. The Company reserves the right to restrict the screening classes or combinations of classes to standard arrangements. Toll Restriction cannot be applied to lines using CUSTOMNET Service.

RATE ELEMENTS

A. Monthly Recurring Cost Per Line Equipped with Customnet.
The monthly recurring cost provides for the recovery of costs associated with the set-up and per line costs of the features central office switching.

B. Non Recurring Cost Per Line Equipped with Customnet.
The non recurring cost includes the non recurring service and equipment costs asssociated with the ordering of the feature.

C. STUDY METHODOLOGY

RECURRING

The costs that are identified are direct costs that occur as a result of providing restriction/screening. These include digital central office switch costs in the subscriber's serving wire center.

Central office switching feature costs are calculated by first determining incremental switching feature investments. These feature investments are obtained through the use of the U S WEST Communications Inc. (USWC), Switching Cost Model (SCM) for digital stored program controlled central offices. A detailed description of this program is provided in the work papers.

The switch investments include processor time, memory and hardware appropriate for each feature. The investments are converted to monthly costs using monthly cost factors, e.g. land and building, which are applied through the use of the Windows Personal Cost Calculator (WINPC3) cost program.

The WINPC3 model develops Long Run Incremental Costs (LRIC) from investments and/or expenses associated with U S WEST products and services. A detailed description of this program is provided in the work papers.

The investments are converted to monthly costs using monthly cost factors, which are represented as investment based and expense based. Investment based factors include as an example, Capital, Ad Valorem taxes, and etc. Capital costs consist of depreciation, income tax and cost of money. Expense based factors could include as an example, administration, business fee taxes and etc.

NONRECURRING

Nonrecurring costs represent the one-time costs that apply for specific work activities to install and disconnect service. We study the various activities involved in providing the service in order to develop the nonrecurring cost. Following is a description of the required data inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained from field experts who actually perform the work being studied and/or Subject Matter Experts on staff representing the work group.

Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historic investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS (cont'd)

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers.

It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs varies directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

1. All costs displayed are represented on a per line basis.

2. Recurring costs are weighted between three switch types.

MARKET EXPANSION LINE SERVICE

RECURRING AND NONRECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's long run incremental costs it will incur to provide Market Expansion Line (MEL) service in the State of Arizona.

This study develops for U S WEST, in Arizona, average long run incremental costs. Costs are stated on a service element basis.

B. DESCRIPTION OF SERVICE

Market Expansion Line (MEL) is a central office based service that enables a customer to receive calls at their location, which are forwarded within the same central office. The call is automatically forwarded to the customer's premise. No operator assistance is required. MEL provides the subscriber with the ability to receive calls and attract business from remote exchange areas by appearing to have a local presence. The cost for the first line arranged reflects the cost of the Main Directory Listing, and each additional line arranged and billed on that line will not receive a listing, thus does not include that cost

C. STUDY METHODOLOGY

RECURRING

The costs that are identified are direct costs that occur as a result of providing restriction/screening. These include digital central office switch costs in the subscriber's serving wire center.

Central office switching feature costs are calculated by first determining incremental switching feature investments. These feature investments are obtained through the use of the U S WEST Communications Inc. (USWC), Switching Cost Model (SCM) for digital stored program controlled central offices. A detailed description of this program is provided in the work papers.

The switch investments include processor time, memory and hardware appropriate for each feature. The investments are converted to monthly costs using monthly cost factors, e.g. land and building, which are applied through the use of the Windows Personal Cost Calculator (WINPC3) cost program.

The WINPC3 model develops Long Run Incremental Costs (LRIC) from investments and/or expenses associated with U S WEST products and services. A detailed description

of this program is provided in the work papers.

C. STUDY METHODOLOGY (Continued)

The investments are converted to monthly costs using monthly cost factors, which are represented as investment based and expense based. Investment based factors include as an example, Capital, Ad Valorem taxes, and etc. Capital costs consist of depreciation, income tax and cost of money. Expense based factors could include as an example, administration, business fee taxes and etc.

NONRECURRING

Nonrecurring costs represent the one-time costs that apply for specific work activities to install and disconnect service. We study the various activities involved in providing the service in order to develop the nonrecurring cost. Following is a description of the required data inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained

from field experts who actually perform the work being studied and/or Subject Matter Experts on staff representing the work group.

Probabilities related to service orders are developed from the Service Order Activity Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historic investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs varies directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS (cont'd)

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

1. All costs displayed are represented on a per line basis.

2. Recurring costs are weighted between three switch types.

3. The first line arranged for Market Expansion Line service includes the cost of a Main Directory Listing. Each additional line arranged and billed on this line for the same subscriber does not require the listing. This study uses costs developed in an independent study for Directory Listings completed November 1998.

SWITCHED ACCESS SERVICE
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the 1998 long-run incremental costs U S WEST Communications (USWC) will incur for each minute of use for Switched Access Service within the State of Arizona.

This study develops statewide average long run incremental costs (LRIC). All costs are stated on a per minute of use (MOU) basis and are for Local Switching, End Office Trunk Ports, Tandem Switching, Tandem Trunk Ports, Common Transport Multiplexing, and the tandem switched portion of Local Transport.

B. DESCRIPTION OF SERVICES

1. SWITCHED ACCESS SERVICE

Switched Access Service provides the transmission path required by an Interexchange Carrier (IXC) to extend its telecommunications facilities to end users via U S WEST's intraLATA switched network. This path extends from the Interexchange Carrier's Point of Presence (POP) to the end office serving the end user's premises. It provides an Interexchange Carrier with access to end users and provides end users access to the facilities of an Interexchange Carrier for the purpose of making or receiving calls. Switched Access Service provides the capability to both originate and terminate calls to end users.

This cost study addresses three cost components associated with Switched Access Service. Local Switching, Tandem Switching and Tandem Switched Local Transport are described as follows:

A. Local Switching

Local switching consists of:

1) Originating and/or terminating end office switching.

2) Basic Intercept service which includes limited mechanical announcements informing callers of new numbers, referral numbers

and/or line status.

3) Carrier access billing which provides the billing mechanism for U S WEST to charge Interexchange Carriers for use of the USWC local network.

4) Toll assistance which includes providing operator support for Switched Access calls. This includes miscellaneous operator support for calls such as 0- No attempt, dialing instructions, and connections to directory assistance.

5) Measurement equipment components located within the switching machines and teleprocessing measurement costs associated with polling switching machines to obtain billing information.

6) The cost of local switching is calculated with and without the end office shared trunk port and well as the cost for the shared trunk port on per MOU and as a dedicated monthly cost at a DS0 level.

B. Tandem Switching

This includes the usage sensitive cost of switching an originating or terminating call through an Access Tandem switch.

A monthly cost for a dedicated tandem trunk port at a DS0 level is included.

C. Tandem Switched Local Transport

Tandem Switched Local Transport provides the transmission path from the wire center serving the Interexchange Carrier's Point of Presence through the Access Tandem Switch to the end office which serves the end user. This study calculates costs for the two elements of Tandem Switched Transport:

1) Non-Distance Sensitive

a. Common Transport Multiplexing. This element identifies the usage sensitive costs associated with multiplexing common interoffice facilities in end offices and tandem switches. These multiplexing costs are stated for each of the mileage bands.

b. Common Transport Terminations. This element identifies the usage sensitive costs associated with terminating interoffice facilities in end offices and tandem switches. These termination costs are stated for each of the mileage bands.

2) Distance Sensitive

The costs identified in this element are also usage sensitive and are associated with the outside plant facilities and intermediate multiplexing which is required to connect central offices and tandem switches in the USWC network. The costs are different by mileage bands as the costs vary by the distances between the offices.

C. STUDY METHODOLOGY

Two U S WEST Communications (USWC) models are used to calculate the long-run incremental investment of the USWC network. The Switched Usage Model (SUM) calculates the investment associated with switching and measuring calls in end office and tandem switches and the Transport Model (TM) calculates the investment associated with transporting calls over the USWC interoffice network. Both investment models calculate the incremental investment for essential network components which are not product or service specific.

Investment associated with Billing and Collections, Intercept, Operator Assistance and Measurement Polling are calculated in separate studies.

Per call set-up and per conversation minute investment for end office switching, tandem switching and measurement from the Switched Usage Model and interoffice facility and terminations from the Transport Model are mapped to specific services using the Microsoft® Excel spreadsheets located in Tab 5 of this study. The spreadsheets calculate the investment of specific services by determining the quantity of the network components required for specific services, adding in the appropriate Billing and Collection, Intercept, Operator Assistance and Measurement Polling investment and formatting the investment into the rate structure of the services being studied.

1998 base year investments in the Switched Usage Model (SUM) and the Transport Model (TM) along with forward-looking trended 1998 factors were applied to the investments via the Retail Cost Program (RCP) to create 1998 costs for end office switching, measurement and tandem switching

Costs are identified on a per minute of use (MOU) basis. The investment is actually calculated on a per call set-up and per conversation minute basis within the investment models, but are converted to a per MOU basis using the Microsoft® Excel spreadsheets to match the Switched Access tariff format. The spreadsheets in Tab 5 are used to make the conversion.

Billing and Collections, Intercept, Operator Assistance, and Measurement Polling expenses are calculated in separate studies.

No product specific advertising expenses are included in this study.

The costs identified in this study represent average per unit costs when demand for the services studied starts at zero. Total network demand is calculated in the Switched Usage Model (SUM) using office characteristics and busy hour data for each of the USWC central offices in the study.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. Costs do not reflect the emergence of widespread competition in the local exchange market.

c. All network investments are forward-looking:

   i. Switching and transport equipment and facilities are digital.
   ii. SONET is the forward looking technology in the interoffice network.

d. Standby capacity is a volume-sensitive cost. Non-volume sensitive spare switching capacity (e.g., modular spare) is a shared cost. Please refer to documentation for the Switching Cost Model for further explanation.

INTRASTATE INTRALATA MESSAGE TELECOMMUNICATIONS SERVICE

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate the 1998 long-run incremental costs that U S WEST Communications will incur for each billed minute of use for Intrastate IntraLATA Message Telecommunications Service (MTS) within the State of Arizona.

This study develops statewide average long run incremental costs (LRIC) costs. Costs are stated on a billed minute basis by time of day.

Traffic sensitive usage costs are provided for interexchange transport, tandem switching, end office switching, measurement, intercept, toll assistance, and billing.

B. DESCRIPTION OF SERVICE

Message Telecommunications Service (MTS) is a long distance toll telephone service that allows telephone communications between users in two different local calling areas. It provides two-way transport of end-user message toll calls within a given LATA via the interexchange public switched network.

The communication path for this service extends from the serving wire center for the end user that originates the call to the serving wire center for the end user where the call is terminated.

This cost study includes the costs for the following components:

a. The interexchange transport transmission path between the originating and terminating end offices. It includes interoffice trunk facility and termination and signaling equipment as well as tandem switching equipment.

b. Traffic sensitive switching components in the originating and terminating end offices.

c. Basic Intercept service which includes limited mechanical announcements informing callers of new numbers, referral numbers and/or line status.

d. Billing and Collections that provide the billing mechanism for U S WEST to

charge end users for the use of our toll network. It also includes costs to the business office for MTS customer inquiries.

e. Operator Assistance that includes providing operator support for MTS calls. This includes miscellaneous operator support for calls such as dialing instructions and connections to directory assistance.

f. Measurement equipment components located within the switching machines and teleprocessing measurement costs.

C. STUDY METHODOLOGY

Two U S WEST Communications (USWC) models are used to calculate the long-run incremental investment of the USWC network. The Switched Usage Model (SUM) calculates the investment associated with switching and measuring calls in end office and tandem switches and the Transport Model (TM) calculates the investment associated with transporting calls over the USWC interoffice network. Both investment models calculate the incremental investment for network components which are not product or service specific.

Investment associated with Billing and Collections, Intercept, Operator Assistance and Measurement Polling are calculated in separate studies.

Per call set-up and per conversation minute investment for end office switching, tandem switching and measurement from the Switched Usage Model and interoffice facility and terminations from the Transport Model are mapped to specific services using the Microsoft® Excel spreadsheets located in Tab 5 of this study. The spreadsheets calculate the investment of specific services by determining the quantity of the network components required for specific services, adding in the appropriate Billing and Collection, Intercept, Operator Assistance and Measurement Polling investment and formatting the investment into the rate structure of the services being studied.

1998 base year investments in the Switched Usage Model (SUM) and the Transport Model (TM) along with forward-looking trended 1998 factors were applied to the investments via the Retail Cost Program (RCP) to create 1998 costs for end office switching, measurement and tandem switching

Costs are identified on a per minute of use (MOU) basis. The investment is actually calculated on a per call set-up and per minute basis within the investment models, but are converted to the MTS MOU format by spreading the call set-up investment across the average duration of an MTS call. Set-up investment and MOU investment are added to create a total investment per MOU. These conversions are made in the Microsoft® Excel spreadsheets.

Billing and Collections, Intercept, Operator Assistance, and Measurement Polling expenses are calculated in separate studies.

The costs identified in this study represent average per unit costs when demand for the services studied starts at zero. Total network demand is calculated in the Switched Usage Model (SUM) using office characteristics and busy hour data for each of the USWC central offices in the study.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses,

commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. Costs do not reflect the emergence of widespread competition in the local exchange market.

c. Standby capacity is a volume-sensitive cost. Non-volume sensitive spare switching capacity (e.g., modular spare) is a shared cost. Please refer to documentation for the Switching Cost Model for further explanation.

d. All network investments are forward-looking:

   i. Switching and transport equipment and facilities are digital.
   ii. SONET is the forward looking technology in the interoffice network.

DIGITAL DATA SERVICE
NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

This study estimates forward-looking nonrecurring long run incremental costs U S WEST will incur to provide Digital Data Service. The study results represent direct 1998 costs. The results of this study may be used for pricing and other management decisions.

B. DESCRIPTION OF SERVICE

Digital Data Service (DDS) is provided on a two-point or multipoint, 4-wire basis and is capable of transmission of synchronous serial data at the rate of 2.4, 4.8, 9.6, 19.2, 56 or 64 Kbps. The circuit provides a synchronous service, with timing provided by the company through their facilities, to the customer in the received bit stream. 64 Kbps service is available on a two-point basis only.

C. STUDY METHODOLOGY

Nonrecurring costs represent the one-time charges that apply for specific work activities. We study the provisioning activities involved in providing a service in order to develop the Nonrecurring cost. Following is a description of the required cost inputs:

Time Estimates
The time estimate is the average amount of time required to perform a particular work function.

Probabilities
A probability is the percent of time a particular work function is performed for a particular service offering. Probabilities were developed from reports and by field experts.

Expense Factors
The program applies expense factors to the direct cost. The factors include Business Fees and assignable Administrative Expense.

Labor Rates
Directly assigned labor rates were developed based on data from the general ledger

journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the U S WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., motor vehicle expense, general purpose tools, etc.)

NONRECURRING COST PROGRAM

The Nonrecurring Cost Program (NRC) performs the mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Total Service Long Run Incremental (TSLRIC) results.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

END USER DIRECTORY ASSISTANCE COST STUDY

PURPOSE

The purpose of this study is to determine the 1998 costs to U S WEST Communications for providing Directory Assistance service to it's end user customers. The study results are expressed using Long Run Incremental Cost (LRIC) format and represent an average cost per Directory Assistance call.

DESCRIPTION

Directory Assistance service provides telephone number and address information for the business, residence, or government listing the caller requests.

METHODOLOGY

The cost components included in this study are operator related expenses, equipment related expenses, dedicated facilities expenses, transport and switching expenses, and billing expenses.

The costs for the operator related, transport and switching, and billing components were developed on a per call basis. The costs per call for the equipment and dedicated facilities components were determined by dividing expenses by appropriate call volumes. The Retail Cost Program is utilized to apply appropriate loading factors, investment based factors, and expense based factors to these cost components.

DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs – Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that

product or service. It does not include costs that are required but which benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these costs categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. Costs do not reflect the emergence of widespread competition.

c. All network investments are forward-looking:

i. Switching and transport equipment and facilities are digital.
ii. SONET is the forward looking technology in the interoffice network.

INTERNET (URL/EMAIL) LISTINGS - RESIDENCE/BUSINESS RECURRING COST STUDY

PURPOSE

The purpose of this study is to determine the 1998 costs to U S WEST Communications for providing Internet (URL/EMAIL) Listings - Residence/Business. The study results are expressed using Long Run Incremental Cost (LRIC) format and represent an average monthly cost per residence and/or business Internet (URL/EMAIL) Listing.

DESCRIPTION

Internet (URL/EMAIL) Listings are two new listing options being added to the Directory Listings service offering. The Uniform Resource Locator (URL) Address Listing identifies the customer's URL address used to identify resources on the Internet's World Wide Web. The E-Mail Address Listing identifies the customer's electronic mail address used to send and receive mail on a computer. These will both be available for residence and business customers. The customer will be required to have a directory listing in order to also have an URL listing and/or an E-Mail Listing.

METHODOLOGY

The cost components included in this study are premium listing expenses, DEX charge expense and LSS modification expense.

The expense for the DEX charge component was developed on a per listing basis. The expenses per listing for the premium listing and LSS modification components were determined by dividing expenses by appropriate listing volumes. Monthly expenses were determined by calculating the periodic payment of the annual expense over twelve (12) months. The Retail Cost Program was utilized to apply appropriate expense based factors to these components and develop the monthly cost per listing.

DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs – Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fee.

ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. Costs do not reflect the emergence of widespread competition.

DIRECTORY ASSISTANCE CALL COMPLETION SERVICE

RECURRING

COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to determine the costs to U S WEST Communications, Inc., for providing Directory Assistance Call Completion service in Arizona. The study results are expressed in Long Run Incremental Cost (LRIC) format. The Directory Assistance Call Completion cost per call is in addition to the Directory Assistance cost per call.

B. DESCRIPTION OF SERVICE

Directory Assistance Call Completion offers automatic call completion on local and intralata Directory Assistance calls.

C. STUDY METHODOLOGY

The cost components included in this study are switch software RTU, database hardware, hardware maintenance, software right to use (RTU) and software maintenance, interoffice facility and billing. The costs per call for the equipment related, database related and interoffice facility components were determined by dividing expenses by appropriate call volumes. The billing cost is provided on a per call basis. The Retail Cost Program is utilized to apply appropriate loading factors, investment based factors and expense based factors to these components.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historical investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs – Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most

closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs vary directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as shared cost.

Total Direct + Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fee.

E. ASSUMPTIONS

a. Costs are based on a least cost scorched node scenario and represent the cost of fully replacing the network required to provision the service, beginning from the existing grid of network nodes used by U S WEST today.

b. Costs do not reflect the emergence of widespread competition.

c. All network investments are forward-looking:

i. SONET is the forward-looking technology in the interoffice network.

CALL WAITING DELUXE SERVICE
RECURRING AND NONRECURRING
COST STUDY

A. PURPOSE, SCOPE, AND APPLICATION

The purpose of this study is to estimate U S WEST's long run incremental costs it will incur to provide the Call Waiting Deluxe feature in the State of Arizona.

This study develops for U S WEST, in Arizona, average long run incremental costs. Costs are stated on a service element basis.

B. DESCRIPTION OF SERVICE

Call Waiting Deluxe is a central office based service which enables a customer to handle and dispose of call waiting calls in any of the following ways: 1) Put the current caller on hold and take the new call, 2) Conference the incoming call with the existing call, 3) Send a pre-recorded message telling the caller to hold, 4) Send the new caller directly to Voice Messaging, or 5) Drop the current call. This service is available and provided only in switches where Call Waiting ID is also equipped.

C. STUDY METHODOLOGY

RECURRING

The costs that are identified are direct costs that occur as a result of providing CLASS. These include digital central office switch costs in the subscriber's serving wire center.

Central office switching feature costs are calculated by first determining incremental switching feature investments. These feature investments are obtained through the use of the U S WEST Communications Inc. (USWC), Switching Cost Model (SCM) for digital stored program controlled central offices. A detailed description of this program is provided in the work papers.

The switch investments include processor time, memory and hardware appropriate for each feature. The investments are converted to monthly costs using monthly cost factors, e.g. land and building, which are applied through the use of the Windows Personal Cost Calculator (WINPC3) cost program.

The WINPC3 model develops Long Run Incremental Costs (LRIC) from investments and/or expenses associated with U S WEST products and services. A detailed description of this program is provided in the work papers.

The investments are converted to monthly costs using monthly cost factors, which are represented as investment based and expense based. Investment based factors include as an example, Capital, Ad Valorem taxes, and etc. Capital costs consist of depreciation, income tax and cost of money. Expense based factors could include as an example, administration, business fee taxes and etc.

NONRECURRING

Nonrecurring costs represent the one-time costs that apply for specific work activities to install and disconnect service. We study the various activities involved in providing the service in order to develop the nonrecurring cost. Following is a description of the required data inputs:

Time Estimates: The time estimate is the average amount of time required to perform a particular work function. We obtain the time estimates from Field experts, who represent the groups doing the work.

Probabilities: A probability is the percentage of time U S WEST performs a particular work function for a particular service offering. We develop the probabilities from reports and from the input of field experts.

Labor Rates: Directly assigned labor rates were developed based on data from the general ledger journal file and the engineering and plant clearance rates in the Corporate Table System. The directly assigned labor rates consist of costs that can be directly attributed to the function being performed and are forward looking based on the wage and salary index and the percent change in the post-retirement benefits, the US WEST employee count and the Consumer Price Index. Components that make up labor rates include: basic wages and salaries, direct supervision and clerical support, benefits, and other costs where applicable (e.g., office expense, motor vehicle expense, general purpose tools, etc.)

Expense Factors: The program applies expense factors to the direct cost. The factors include Commercial Marketing, Network Support, Attributable, and in certain state jurisdictions, Common.

The Nonrecurring Cost Program (NRC) performs mechanized cost calculations associated with the one time labor expense resulting from a customer request for service. Inputs to the calculations include: labor time, probability of occurrence, labor rate, and expense factors. Formatting commands performed by the program generate Long Run Incremental (LRIC) results.

Regional negotiation times were used to develop the costs. Time estimates were obtained from field experts who actually perform the work being studied and/or Subject Matter Experts on staff representing the work group.

Probabilities related to service orders are developed from the Service Order Activity

Tracking (SOAT) Reports. Historical data is used as the basis for estimating service order patterns in the future.

D. DESCRIPTION OF LONG RUN INCREMENTAL COSTS

Long Run Incremental Costs (LRIC) is the method U S WEST uses to estimate product and service costs. It provides a measurement of costs over a period of time long enough to fully adjust to changes of output (including changes in the size of facilities, levels of investment, etc.) in order to optimally accommodate this change. This methodology is forward looking in nature (i.e. LRIC uses the latest technology costs or replacement costs). Since LRIC is forward looking, it does *not* measure historic investment decisions of the corporation.

The U S WEST incremental format disaggregates the cost results on a unitized basis into the components shown below:

Total Direct Costs -- Total direct costs are the total forward-looking direct costs of providing a product or service to the total universe of U S WEST customers. It most closely reflects the cost of replacing all the facilities directly required to provide that product or service. It does not include costs that are required but which also benefit the provision of other products and services. It reflects the forward looking cost of the entire service provided in the most efficient manner, holding constant the production of all other services produced by the firm. This cost has frequently been referred to as TSLRIC.

Network Support Costs – Are network administration costs plus engineering costs that can be directly identified to the provision of a group of services. The level of these costs varies directly with the total volume of the group of services being provided and is not directly dependent on the quantity of any individual service in that group. This cost is often referred to in economic terms as the shared cost.

Total Direct plus Network Support Costs – Are the sum of the Total Direct Costs for a service and the Network Support Costs associated with a service. This cost has frequently been referred to as TSLRIC + SC.

Typically, the costs identified by these cost categories include capital costs for depreciation, return, and income taxes. They also include ongoing operating costs for: maintenance expense, network support expenses, general support expenses, commercial marketing expense, expensed right to use fees, Ad Valorem taxes and business fees.

E. STUDY ASSUMPTIONS

1. All costs displayed are represented on a per line basis.
2. Recurring costs are weighted between two switch types.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO.E-1051-98-_____ AFFIDAVIT OF Jerrold L. Thompson
STATE OF COLORADO	)	
COUNTY OF DENVER	)	
	) :)	SS

Jerrold L. Thompson, of lawful age being first duly sworn, deposes and states:

1. My name is Jerrold L. Thompson. I am Executive Director-Service Cost Information of U S WEST Communications in Denver, CO.

2. Attached hereto and made a part hereof for all purposes is my testimony.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Jerrold L. Thompson

Jerrold L. Thompson

SUBSCRIBED AND SWORN to before me this 7th day of December, 1998.

Rebecca J. Albritton

Notary Public

NOTARY PUBLIC
REBECCA J. ALBRITTON
STATE OF COLORADO

My Commission Expires:

7-24-02

REDACTED

RECEIVED

BEFORE THE ARIZONA CORPORATION COMMISSION

1999 DEC -1 P 4: 09

AZ CORP COMMISSION
DOCUMENT CONTROL

EXHIBIT
Q-16
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-01051B-99-0105

SUPPLEMENTAL TESTIMONY OF

GEORGE REDDING

U S WEST COMMUNICATIONS

DECEMBER 1, 1999

1 **Q. PLEASE STATE YOUR NAME , TITLE, EMPLOYER AND ADDRESS.**

2 A. My name is George Redding. I am employed by U S WEST Communications
3 ("U S WEST" or "Company") as Director-Regulatory Finance. My address is 1801
4 California, Denver, Colorado.
5
6 **Q. ARE YOU THE SAME GEORGE REDDING WHO FILED DIRECT TESTIMONY IN THIS**
7 **PROCEEDING?**
8 A. Yes, I am.
9
10 **Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY?**
11 A. There are several issues that have occurred since I filed my direct testimony in January
12 of this year. There were also several issues raised by interrogatories that have been
13 received during this period. My testimony here responds to these issues and
14 supplements the revenue requirement calculation that I filed in January.
15
16 **Q. DIDN'T YOU FILE SUPPLEMENTAL TESTIMONY IN MARCH OF 1999?**
17 A. Yes, I did.
18
19 **Q. DOES THIS TESTIMONY BUILD OFF OF THAT SUPPLEMENT?**
20 A. No, it does not. This testimony will address all pertinent issues raised in that testimony,
21 but the modifications I am making to the revenue requirement are modifications to the
22 original revenue requirement I presented in January of 1999. In other words, the March
23 testimony and accompanying exhibits can be discarded.
24
25 **Q. HAVE YOU UPDATED YOUR EXHIBITS?**

1 A. Yes. I have prepared a revised Exhibit GAR-1, which shows the impact of the revisions.
2 Behind that are two main Exhibits - GAR-1A and GAR-1B - which summarize the
3 individual adjustments.
4
5 Based on the number of adjustments and the relatively small size of a number of them,
6 both individually and collectively, I chose to make only the major adjustments that
7 exceeded $1.5M in revenue requirement value. These are the adjustments summarized
8 on Exhibit GAR-1A and individually explained by Exhibits GAR-1A1 through GAR-1A7.
9 The adjustments that were not included are summarized on Exhibit GAR-1B.
10
11 **Q. WHAT IS THE IMPACT OF THESE REVISIONS?**
12 A. They revised the revenue requirement downward by $18.0M. The revised revenue
13 requirement is $207.7M.
14
15 **Q. CAN THE AMOUNTS IN YOUR EXHIBITS BE DIRECTLY TRACED TO THE**
16 **REFERENCED INTERROGATORIES?**
17 A. No. All of the adjustments on both Exhibits GAR-1A and GAR-1B have been adjusted to
18 reflect end of period values. This is consistent with the original revenue requirement
19 which also reflects end of period values.
20
21 **Q. ARE THE FINAL DEPRECIATION CHANGES INCLUDED IN THIS REVISION?**
22 A. No, the final depreciation is not included. It was not available at the time of this filing. A
23 final revision will be provided as soon as the depreciation change is known. This revision
24 is being filed to allow the parties to examine the changes that have occurred thus far.
25
26 **Q. DID ALL OF THE REVISIONS RESULT FROM THE INTERROGATORY PROCESS?**

A. No. There were issues that resulted from other cases and also issues initiated by U S WEST.

Q. PLEASE DESCRIBE THEM.

A. The first has to do with the long term number portability ("LNP") surcharge. The final rate for LNP was set by the FCC in July of 1999. A portion of the costs to provide LNP are allocated to the intrastate jurisdiction in the separations process, but all of the revenue allowed by the FCC for recovery of these costs is recorded in the interstate jurisdiction. To prevent any double recovery of these costs in the ratemaking environment, the Company is allocating a portion of those revenues to the intrastate jurisdiction for ratemaking purposes. The adjustment was calculated by multiplying the number of customer lines that would have been LNP compatible at June 30, 1998, the end of the test year, by the FCC tariff per line. Then approximately 82% of this amount was allocated to the intrastate jurisdiction to arrive at the amount in the adjustment.

Q. WHAT OTHER ADJUSTMENTS REQUIRE EXPLANATION?

A. There is one adjustment that relates to an order by the Commission. It arises from Decision No. 61304, related to payphones. In their order the Commission ordered U S WEST to refund back to April 1997. The Company firmly believes that this portion of the order amounted to retroactive ratemaking and has, therefore, appealed the order. While the order said that the amounts ordered could be addressed in the rate case, I have made no adjustment for the refund portion of this issue until a court order is issued. An adjustment has been calculated for the going forward portion of the order. As it is less than $1.5M, it is included on Exhibit GAR-1B.

Q. ARE THERE ANY FURTHER REVISIONS NOT RELATED TO INTERROGATORIES?

A. There are three further adjustments. In its review of its filing, U S WEST found an error in its income to revenue multiplier ("multiplier"). It had to do with the state tax portion of the multiplier. While the correct rate was used, Federal income taxes are no longer deductible in calculating state income taxes. This adjustment corrects this error. The correction is shown on Exhibit GAR-3 Revised.

Another adjustment relates to a separations change. This change was made late in the calendar year of 1998. The portion of that change that affected the test year is reflected in my adjustment.

The last adjustment not related to interrogatories is an adjustment to correct an accounting error related to Internet Access. Internet Access is a service provided by Interprise America. It is not provided by U S WEST Communications, Inc. During 1998, certain expenses relating to Internet Access were inadvertently allocated to USWC. The error was discovered before the end of the 1998 calendar year and the erroneous accounting entries were reversed. However, the error was not discovered prior to the end of the test period. As a result, it was mistakenly included in the Company's rate case filing. The adjustment to remove Internet Access from the rate case filing is shown on Exhibit GAR-1B.

Q. ARE ALL THE REST OF THE ADJUSTMENTS RELATED TO ISSUES RAISED IN THE INTERROGATORY PROCESS?

A. Yes, they are. I have referenced pertinent interrogatories in my explanation of each adjustment. Each of the adjustments are explained on Exhibits GAR-1A1 through GAR-1A7.

Q. IS THERE A DETAILED EXPLANATION FOR EACH OF THE ADJUSTMENTS ON EXHIBIT GAR-1B?

A. No, there is not. As I explained at the beginning of my supplemental testimony, the amounts are insignificant. I included Exhibit GAR-1B so that the parties would know that I had considered all of these items raised in the interrogatory process.

Q. ARE THERE ANY CHANGES TO THE R14 FILING PACKAGE?

A. Yes, there are. In my March filing I submitted some minor changes in proposed rates on the H series of schedules. I am resubmitting those changes with this filing. These particular schedules are identical to those filed in March. The revenue requirement update reflected in this filing impacts the A and B series of schedules. Those schedules, reflecting the updates, are also attached.

Q. DOES THAT CONCLUDE YOUR SUPPLEMENTAL TESTIMONY?

A. Yes, it does.

U S WEST
Arizona Intrastate Operations
Revenue Requirement Summary
Test Year Ending June 30, 1998
$(000)

		Original Cost		Fair Value
1. Adjusted Rate Base		1,473,960		1,736,699
2. Adjusted Net Operating Income		73,596		73,596
3. Current Rate of Return (L2/L1)		4.99%		4.24%
4. Required Operating Income (L1*L5)		158,322		186,544
5. Required Rate of Return		10.74%		10.74%
6. Operating Income Deficiency		84,726		112,948
7. Gross Revenue Conversion Factor		1.6808		1.6808
8. Increase in Gross Revenue Requirements (L6*L7)	$	142,406	$	189,840
9. Three Year Revenue Requirement		83,336		83,336
10. Total Increase in Revenue Requirement (L8+L9)	$	225,742	$	273,176
11. Revisions to Revenue Requirement	$	(18,013)		
12. Revised Increase in Revenue Requirement	$	207,729		

U S WEST
Arizona Intrastate Operations
Revision Summary
Test Year Ending June 30, 1998
$(000)

Summary of Revisions to Requirement	December 1999 Correction Adjustments
Revenue Multiplier Update	2,432
Payphone Correction (UTI 10-9, RUCO 18-2)	(1,712)
OPEB Adjustment (UTI 13-59)	5,432
Separations Adjustment	(3,785)
Remove VDSL (UTI 15-14)	(2,883)
End of Period Miscellaneous Revenues (UTI 32-6)	(7,091)
LNP	(10,406)
Total Adjustments	(18,013)

U S WEST

Arizona Intrastate Operations
Accounting Adjustment

Test Year Ending June 30, 1998

Impact on Revenue Multiplier Correction

(In Thousands of Dollars)

Operating Revenues	11,885
Operating Expenses	11,899
Total Operating Income Taxes	(213)
Net Operating Income	198
Rate Base	15,233
Revenue Requirement	2,432

This adjustment reflects the impact of the revised Revenue Multiplier on the original January 8, 1999 filing. This revision corrects the State and Federal tax factors in the Multiplier.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Payphone Correction
(End of Period)

Test Year Ending June 30, 1998

(In Thousands of Dollars)

Operating Revenues	(20,494)
Operating Expenses	(235)
Total Operating Income Taxes	(8,144)
Net Operating Income	(12,115)
Rate Base	0
Revenue Requirement	20,494
Original Revenue Requirement	22,206
Incremental Revenue Requirement	(1,712)

This adjustment reflects the incremental change of the correction to the P-01 End of Period Revenue adjustment for payphone toll revenues and replaces adjustment AA-12 as originally provided. Refer to UTI 10-9 and RUCO 18-2

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

OPEB End of Period Adjustment

Test Year Ending June 30, 1998

(In Thousands of Dollars)

Operating Revenues	0
Operating Expenses	25,818
Total Operating Income Taxes	(11,250)
Net Operating Income	(14,568)
Rate Base	6,156
Revised Revenue Requirement	25,762
Less Original Revenue Requirement (1-8-99)	20,330
Incremental Revenue Requirement	5,432

This adjustment reflects the results when restating OPEB on an end of period basis. Refer to UTI 13-59.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Test Year Ending June 30, 1998

Separations Retro
(End of Period)

(In Thousands of Dollars)

Operating Revenues	34
Operating Expenses	(2,854)
Total Operating Income Taxes	1,157
Net Operating Income	1,731
Rate Base	(4,709)
Revenue Requirement	(3,785)

A retroactive adjustment was made in the Separations process to rerun all months of 1998 updating the translation of circuit types and investment allocations. This adjustment reflects the impact of June 1998 on an annualized basis.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

VDSL Adjustment
(End of Period)

Test Year Ending June 30, 1998

(In Thousands of Dollars)

Operating Revenues	0
Operating Expenses	(1,810)
Total Operating Income Taxes	784
Net Operating Income	1,026
Rate Base	(6,313)
Revenue Requirement	(2,883)

This adjustment removes from the part 64 products VDSL expense and investment on an end-of-period basis. Refer to UTI 15-14.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Miscellaneous Revenues End of Period Adjustment

Test Year Ending June 30, 1998

(In Thousands of Dollars)

Operating Revenues	7,091
Operating Expenses	81
Total Operating Income Taxes	2,818
Net Operating Income	4,192
Rate Base	0
Revenue Requirement	(7,091)

This adjustment synchronizes Miscellaneous Revenues with the end of period rate base. Refer to UTI 32-6.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Test Year Ending June 30, 1998

LNP Intrastate Revenue

(In Thousands of Dollars)

Operating Revenues	10,406
Operating Expenses	119
Total Operating Income Taxes	4,135
Net Operating Income	6,152
Rate Base	0
Revenue Requirement	(10,406)

This adjustment computes the annualized impact of including Interstate LNP Revenue to the Intrastate jurisdiction based on the Federal Tariff finalized in July of 1999.

U S WEST
Arizona Intrastate Operations
Revisions Not Made Summary
Test Year Ending June 30, 1998
$(000)

Summary of Revisions Not Made	December 1999 Correction Adjustments
CWC Salary Change (UTI 9-43)	(72)
1997 Income Tax True-Up Incremental Change	(775)
Inventory Adjustment (RUCO 12-5)	866
Service Quality Adjustment (RUCO 9-8, RUCO 12-3, RUCO 17-8)	1,052
Reclass of Restricted Stock (RUCO 18-4)	(362)
Payphone (APA 1-1; ACC Decision No. 61304)	776
Olympic Sponsorship (RUCO 14-1)	666
Affiliate Interest True-Up (UTI 32-37)	(541)
USWIT Payments for Software Licenses (UTI 13-15)	(925)
PCS Revenue Adjustment (UTI 23-19)	(692)
Wireless Billing & Collection Revenues (RUCO 8-9)	(1,215)
Pension Asset Incremental Change (UTI 20-6)	350
Prepaids (UTI 20-2)	237
Federal USF Decrease	1,590
U S WEST.net Referrals (UTI 29-20)	(690)
Remove Internet Access	(224)
Total Adjustments	41

U S WEST
Arizona Intrastate Operations
Income to Revenue Multiplier
Test Year Ending June 30, 1998
$(000)

1	Gross Intrastate Revenue	100.00%
2	Less: Uncollectible Revenue	1.032%
3	Total Revenue (L1-L2)	98.9680%
4	Less: Taxes on Local Revenue Service	0.1124%
5	Taxable Income (L3-L4)	98.8556%
6	Less: Effective State Income Tax (L5 * 8.00%)	7.9084%
7	Less: Effective Federal Income Tax (L5 * 32.20%)	31.8315%
8	Net Operating Earnings (L5-L6-L7)	59.1156%
9	Income to Revenue Multiplier (L1 / L8)	1.6916

The Revenue Multiplier has been corrected to show the appropriate Statutory Income Tax Rates. Specifically, Federal Income Taxes are no longer a statutory deduction for State Income Tax purposes.

U S WEST COMMUNICATIONS, INC.
ARIZONA INTRASTATE OPERATIONS
TEST YEAR ENDING JUNE 30, 1998
$(000)

Arizona Regulation R-14 Filing

Schedule A-1, Page 1 of 1
Title: Computation of Increase in Operating Revenue

Date: December 1, 1999

	A	B
	Test Year Ended June 30, 1998	
	Original Cost	Fair Value
1 Adjusted Rate Base (a)	1,473,960	1,736,699
2 Adjusted Net Operating Income (b)	73,596	73,596
3 Current Rate of Return (L.2/L.1)	4.99%	4.24%
4 Required Operating Income (L.1*L5)	158,322	186,544
5 Required Rate of Return (c)	10.74%	10.74%
6 Operating Income Deficiency (L.4-L.2)	84,726	112,948
7 Gross Revenue Conversion Factor (d)	1.6808	1.6808
8 Increase in Gross Revenue Requirements (L.6*L7)	142,406	189,840
9 Three Year Revenue Requirement	83,336	83,336
10 Adjusted Revenue Requirement (Out of Period Accounting Adjustments)	(18,013)	(18,013)
11 Total Increase in Revenue Requirement (L8+L9+L10)	207,729	255,163
Customer Classification	Projected Revenue Increase due to Rates	Percent Increase
12 Exchange and Network Services	25,754 (e)	3.39%
13 Competitive Services	44,047	46.61%
14 Services Catalog	0	0.00%
15 Private Line Transport Services	7,099	19.02%
16 Access Services	(5,814)	-8.46%
17 Advanced Communications Services	0	0.00%
18 Special Assembly	0	0.00%
19 Total Gross Revenues (Lines 12-19)	71,087	7.19%

Supporting Schedules:
(a) B-1
(b) C-1
(c) D-1
(d) C-3
(e) H-1

Recap Schedules:
None

U S WEST COMMUNICATIONS, INC.
ARIZONA INTRASTATE OPERATIONS
TEST YEAR ENDING JUNE 30, 1998
$(000)

Arizona Regulation R-14 Filing

Schedule A-2, Page 1 of 1
Title: Summary Results of Operations

Date: December 1, 1999

Description	A Prior Years 1996 (a)	B 1997 (a)	C Test Year Ended June 30, 1998 Actual (a)	D Pro Forma Adjusted (b)	3 Yr. Rev. Rqmt. Adjustments (b)	E Projected Year Ended YTD 09/98 Annualized Present Rates (c)	F Proposed Rates (c)
1 Gross Revenues	1,007,752	1,079,972	1,123,866	1,110,724	0	1,145,056	1,215,943
2 Uncollectible Revenue, Operating Expenses and Taxes	940,994	992,175	1,013,247	1,037,075	55,059	1,013,096	1,117,221
3 Operating Income (L.1-2)	66,758	87,797	110,620	73,596	(55,059)	131,960	98,722
4 Other Income and Deductions	(19,015)	(7,166)	6,168	7,215	0	20,228	20,228
5 Interest Expense	46,726	43,419	40,791	45,716	0	40,071	40,071
6 Net Income (L.3-4-5)	$39,047	$51,544	$63,661	$20,666	($55,059)	$71,661	$38,422
7 Earned per Average Common Share	N/A	N/A	N/A	N/A		N/A	N/A
8 Dividends per Common Share	N/A	N/A	N/A	N/A		N/A	N/A
9 Payout ratio	100.00%					N/A	N/A
10 Return on Average Invested Capital	6.02%	7.15%	8.05%	5.12%	-4.25%	8.62%	6.05%
11 Return on Year End Capital	4.82%	5.50%	5.87%	3.73%	-3.10%	6.28%	4.41%
12 Return on Average Common Equity	5.43%	6.95%	8.57%	2.78%	-7.40%	9.63%	5.16%
13 Return on Year End Common Equity	3.90%	5.04%	6.11%	1.98%	-5.28%	6.88%	3.69%
14 Times Bond Interest Earned (Before Federal Income Taxes)	2.03	2.80	3.58	2.36	-	4.01	3.18
15 Times Total Interest Earned (After Income Taxes)	1.84	2.19	2.56	1.45	-	2.79	1.96

Supporting Schedules:
(a) E-2
(b) C-1
(c) F-1

Note: (N/A) Not Available

U S WEST COMMUNICATIONS, INC.
ARIZONA INTRASTATE OPERATIONS
TEST YEAR ENDING JUNE 30, 1998
$(000)

Arizona Regulation R-14 Filing

Schedule B-1, Page 1 of 1
Title: Summary of Original Cost and Fair Value Rate Base Elements

Date: December 1, 1999

	A	B
	As of June 30, 1998	
	Original Cost Rate Base* (a)	Fair Value Rate Base* (b)
1 Plant in Service	3,447,574	3,937,682
2 Less - Depreciation Reserve	1,667,713	1,895,086
3 Net Plant in Service	1,779,861	2,042,597
4 Short Term Plant Under Construction	0	0
5 Materials and Supplies	16,737	16,737
6 Allowance for Cash Working Capital	(36,041)	(36,041)
7 Deferred Income Taxes	319,803	319,800
8 Customer Deposits	8,525	8,525
9 Land Development Agreement Deposits	21,629	21,629
10 Other Assets and Liabilities	63,359	63,359
11 Total Rate Base (L.3 thru 6 less 7 thru 9)	1,473,960	1,736,698

* Including Commission, Accounting, and Pro Forma Adjustments

Supporting Schedules:
(a) B-2
(b) B-3

Recap Schedule:
A-1

Summary of Revenues by Customer Classification
Present and Proposed Rates

	Customer Classification	Revenues in the Test Year		Proposed Change			
		Present Rates (a)	Proposed Rates (b)	Straight Reprice Amount (c)	Demand Reprice Amount (d)		% (e)
1.	Exchange & Network Services	$759,524,729	$785,278,866	$25,754,137	$25,754,137		3.39%
2.	Competitive Services	$94,502,427	$138,549,845	$44,047,418	$44,047,418		46.61%
3.	Services Catalog	$26,582,768	$26,582,768	$0	$0		0.00%
4.	Private Line Transport Services	$37,324,432	$44,423,571	$7,099,139	$7,099,139		19.02%
5.	Access Services	$68,690,308	$62,876,367	($5,813,941)	($5,813,941)		-8.46%
6.	Advanced Communications Services	$2,216,763	$2,216,763	$0	$0		0.00%
7.	Special Assemby	$167,622	$167,622	$0	$0		0.00%
8.	Total Gross Revenues (Lines 1-7)	$989,009,051	$1,060,095,803	$71,086,753	$71,086,753	(f)	7.19%

Supporting Schedules:
(a - m) H-2

Recap Schedule:
(d - f) A-1

Analysis of Revenues by Detailed Class of Service
Present and Proposed Rates

	Class of Service	Revenues in the Test Year: Present Rates (a)	Revenues in the Test Year: Proposed Rates (b)	Proposed Change: Straight Reprice Amount (c)	Proposed Change: Demand Reprice Amount (d)	Proposed Change: % (e)
	EXCHANGE & NETWORK SERVICES					
1.	Section 2 & 3 Service Charges & Residence Nonrecurring Decrease	$54,387,312	$46,653,282	($7,734,030)	($7,734,030)	-14.22%
2.	Zone Connection Charges	$5,052,547	$0	($5,052,547)	($5,052,547)	-100.00%
	EXCHANGE SERVICES					
3.	Basic Exchange Services	$525,790,096	$570,919,978	$45,129,882	$45,129,882	8.58%
4.	Public Access Line Service (PAL)	$5,973,223	$6,181,243	$208,020	$208,020	3.48%
5.	Obsolete Public Access Line Service (PAL)	$211,124	$0	($211,124)	($211,124)	-100.00%
6.	Ancillary Services	$167,764,484	$160,004,160	($7,760,325)	($7,760,325)	-4.63%
7.	Obsolete Ancillary Services	$345,943	$1,520,203	$1,174,260	$1,174,260	339.44%
8.	**TOTAL EXCHANGE & NETWORK SERVICES** (f) (Lines 1 - 7)	$759,524,729	$785,278,866	$25,754,137	$25,754,137	3.39%
	COMPETITIVE SERVICES					
	MESSAGE TELECOMMUNICATIONS SERVICES (MTS)					
9.	Two-Point MTS & Operater Services	$32,519,868	$77,784,184	$45,264,317	$45,264,317	139.19%
10.	METROPAC, Volume Disc and OCPs	$8,792,667	$4,725,010	($4,067,658)	($4,067,658)	-46.26%
11.	WATS Service	$886,623	$886,623	$0	$0	0.00%
12.	Obsolete MTS	$485	$2,855,396	$2,854,911	$2,854,911	588884.28%
13.	Total MTS Services (Lines 9 - 12)	$42,199,643	$86,251,213	$44,051,570	$44,051,570	104.39%
14.	Centron/Centrex	$10,993,621	$10,993,621	$0	$0	0.00%

Analysis of Revenues by Detailed Class of Service
Present and Proposed Rates

	Class of Service	Revenues in the Test Year		Proposed Change		
		Present Rates (a)	Proposed Rates (b)	Straight Reprice Amount (c)	Demand Reprice Amount (d)	% (e)
15.	Wire Maintenance Services	$40,479,986	$40,479,986	$0	$0	0.00%
16.	Miscellaneous Competitive Services	$455,855	$451,703	($4,152)	($4,152)	-0.91%
17.	Obsolete Competitive Services	$373,323	$373,323	$0	$0	0.00%
18.	**TOTAL COMPETITIVE SERVICES** (g) (Lines 13 - 17)	$94,502,427	$138,549,845	$44,047,418	$44,047,418	46.61%
19.	**SERVICES CATALOG** (h)	$26,582,768	$26,582,768	$0	$0	0.00%
20.	**PRIVATE LINE SERVICES** (i)	$37,324,432	$44,423,571	$7,099,139	$7,099,139	19.02%
21.	**ACCESS SERVICES** (j)	$68,690,308	$62,876,367	($5,813,941)	($5,813,941)	-8.46%
22.	**ADVANCED COMMUNICATIONS** (k)	$2,216,763	$2,216,763	$0	$0	0.00%
23.	**SPECIAL ASSEMBLY** (l)	$167,622	$167,622	$0	$0	0.00%
24.	**TOTAL GROSS REVENUES** (m) (Lines 8, 18 - 23)	$989,009,051	$1,060,095,803	$71,086,753	$71,086,753	7.19%

Supporting Schedules:
(a - m) H-2

Recap Schedule:
(f - m) H-1

BEFORE THE ARIZONA CORPORATION COMMISSION

CARL J. KUNASEK
CHAIRMAN
JIM IRVIN
COMMISSIONER
WILLIAM A. MUNDELL
COMMISSIONER

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	**DOCKET NO.T-01051B-99-0105 AFFIDAVIT OF GEORGE REDDING**
	:	**SS**
STATE OF COLORADO	)	
COUNTY OF DENVER	)	

George Redding, of lawful age being first duly sworn, deposes and states:

1. My name is George Redding. I am Director – Regulatory Accounting of U S WEST Communications in Denver, Colorado.

2. Attached hereto and made a part hereof for all purposes is my testimony.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

George Redding

SUBSCRIBED AND SWORN to before me this 22nd day of NOVEMBER, 1999.

WILLIAM R. CURTIS NOTARY PUBLIC STATE OF COLORADO

Notary Public

My Commission Expires:

My Commission Expires 10/28/2003

BEFORE THE ARIZONA CORPORATION COMMISSION

EXHIBIT
Q-17
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105

SUPPLEMENTAL DIRECT TESTIMONY

OF

PETER C. CUMMINGS

U S WEST COMMUNICATIONS

May 3, 2000

TESTIMONY OF PETER C. CUMMINGS
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EXECUTIVE SUMMARY

1. Current Responsibilities:

My name is Peter C. Cummings and my business address is 1600 Bell Plaza, Room 3005, Seattle, Washington 98191. I am employed by U S WEST Communications, Inc. (USWC) as Director - Finance and Economic Analysis.

My job responsibilities include financial analysis of capital costs and capital structure of U S WEST Communications. I develop cost of capital estimates for company cost studies, capital budgeting, and economic analysis. I also testify in state rate cases on rate of return, capital structure, and other financial issues.

2. Purpose of Testimony:

I am appearing before the Corporation Commission to present an analysis of the cost of capital and capital structure for U S WEST Communications, Inc. (USWC). The purpose of my supplemental direct testimony is to update my previous recommendation to the Commission for a fair rate of return on equity and total capital for USWC.

3. Summary of Testimony:

Update of Capital Structure

The updated capital structure for USWC – Arizona contains 47.6% debt and 52.4% equity and the embedded cost of debt is 7.39%.

Update of Fair Return on Equity Capital

The conclusion of my testimony is that a fair return on the equity capital invested in Arizona is in the range of 13.5% to 14.5% and my specific recommendation is that the Commission authorize a fair return on equity capital of 14.0%.

Overall Return Recommendation

When the fair return on equity capital is combined with the Company's capital structure and debt costs, the overall return requirement is 10.86%. I recommend that the Commission set the authorized rate of return at 10.86%.

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT POSITION.

A. My name is Peter C. Cummings and my business address is 1600 Bell Plaza, Room 3005, Seattle, Washington 98191. I am employed by U S WEST Communications, Inc. (USWC) as Director - Finance and Economic Analysis.

Q. ARE YOU THE SAME PETER C. CUMMINGS THAT FILED DIRECT TESTIMONY IN THIS DOCKET?

A. Yes, I am. My work experience and qualifications are described in that testimony.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL DIRECT TESTIMONY?

A. The purpose of this testimony is to update my previous recommendation to the Commission for a fair return on equity and total capital for USWC.

COST OF CAPITAL UPDATE

Capital Structure

Q. HAS USWC'S CAPITAL STRUCTURE CHANGED SINCE YOUR DIRECT TESTIMONY WAS FILED?

A. Yes. The updated capital structure of USWC – Arizona as shown in Exhibit PCC-2 contains 47.6% debt and 52.4% equity. In contrast, the August 1998 capital structure shown in my direct testimony Exhibit PCC-3 contained 41.24% debt and 58.76% equity. The change in capital structure from August 1998 to February 2000 is due to a decrease in book equity primarily due to amortization of the accumulated post retirement benefit obligation and a corresponding increase in short and long term debt financing. The embedded cost of debt is 7.39%.

Market Required Return Estimate for USWC

Q. GIVEN THE VOLATILE CAPITAL MARKET CONDITIONS FOR U S WEST AND QWEST RESULTING FROM THEIR PENDING MERGER, HAVE YOU MADE ANY

CHANGES IN YOUR APPROACH TO ESTIMATING THE MARKET REQUIRED RETURN FOR USWC?

A. Yes. U S WEST is now essentially trading as a derivative of Qwest stock subject to the pricing conditions of the merger agreement. Valuation of U S WEST is further complicated by a relatively large dividend payout until the merger is consummated and a very small dividend payout thereafter. Furthermore, speculation about further business combinations affecting U S WEST and Qwest has added significantly to the price volatility of both stocks. In this market environment the best approach to estimating the market required return for USWC is to specifically exclude U S WEST from the analysis and rely upon market required return estimates for other telephone companies and companies that are risk-comparable to USWC.

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR UPDATED ANALYSIS OF THE MARKET REQUIRED RETURN FOR USWC.

A. Using capital market data from the last two weeks in February, I updated the DCF and CAPM analyses for telephone companies and comparable risk companies using the same procedures as in my direct testimony. The results of these analyses are shown in Exhibits PC-3 through PC-6. As discussed above, I excluded

U S WEST from the DCF and CAPM analyses. The following table summarizes the market required return on equity estimates for USWC:

CAPM	Comparable Companies	13.3%
CAPM	Telephone Companies	13.6%
DCF	Comparable Companies	13.9%
DCF	Telephone Companies	14.3%

The market required return estimates range from 13.3% to 14.3% with a midpoint of 13.8% and an average of 13.8%.

Q. DID YOU ALSO UPDATE THE REASONABLENESS CHECKS ?

A. Yes. The expected return on the market has increased from 14.5% (as shown in my direct testimony) to 15.6%. The expected return on the market is the average of DCF and CAPM estimates of the required return on the Standard & Poor's 500 stocks. The current DCF estimate for the S&P 500 is 15.8% as shown in Exhibit PCC-7 and the CAPM estimate is 15.3% as shown in Exhibit PCC-8. The increase in market required return for equity investment in USWC is accompanied by an increase in the market required for equity investment in the market as a whole.

The updated equity risk premium reasonableness test in Exhibit PCC-9 shows a higher, but narrower range of 14.1% to 14.3%. The current market required return estimate for USWC of 13.8% is below the risk premium range.

Recommended Range for Cost of Equity and Fair Return on Equity

Q. WHAT IS YOUR UPDATED RECOMMENDATION FOR A FAIR RETURN ON EQUITY FOR USWC.

A. As explained in my direct testimony, the market required return on equity is not the same as the cost of equity. The cost of equity is slightly greater due to stock issuance costs. The market required return estimates for USWC need to be adjusted by a factor of 1.17% to reflect the cost of equity capital which includes stock issuance expenses. The adjustment is as follows:

Market Req Return	x	Adj Factor	=	Cost of Equity
13.3% to 14.3%		1.0117		13.5% to 14.5%

My recommended range for a fair return on equity is the range of cost of equity estimates of 13.5% to 14.5% and my specific recommendation for the Commission allowed return on equity is the midpoint of the range, 14.0%

OVERALL RATE OF RETURN RECOMMENDATION

Q. WHAT IS YOUR UPDATED RECOMMENDATION FOR A FAIR OVERALL RETURN ON RATE BASE FOR USWC?

A. Combining the fair return on book equity and USWC's capital structure and embedded debt cost, my recommendation for a fair overall return on rate base is 10.86% which is calculated as follows:

	Percent	Cost	Weighted Cost
Debt	47.6%	7.39%	3.52%
Equity	52.4%	14.0%	7.34%
Overall Return			10.86%

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC. A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105

SUPPLEMENTAL DIRECT TESTIMONY EXHIBITS

OF

PETER C. CUMMINGS

U S WEST COMMUNICATIONS

May 3, 2000

EXHIBIT OF PETER C. CUMMINGS

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Equity Risk Premium	PCC-9

RATE OF RETURN RECOMMENDATIONS

Return on Equity Range	13.5%	to	14.5%
Point Recommendation		14.0%	
Overall Return Range	10.59%	to	11.12%
Point Recommendation		10.86%	

U S WEST COMMUNICATIONS - Arizona
Capital Structure - February 2000

	$(000)	Cost	Percent of Capital
SHORT TERM DEBT			
Notes Payable	$62,313	5.92%	3.22%
Current Maturities	$88,684	7.09%	4.58%
Total Short Term Debt	$150,997	6.61%	7.80%
LONG TERM DEBT			
Funded and Other LT Debt	$750,608	7.56%	38.77%
Capital Leases	$19,376	6.68%	1.00%
Total Long Term Debt	$769,984	7.54%	39.77%
TOTAL DEBT	$920,981	7.39%	47.6%
COMMON EQUITY	$1,015,260		52.4%
TOTAL CAPITAL	$1,936,240		100.0%

DCF Model
Telephone Companies

Company	Price	Expected Dividends Qtr 1	Qtr 2	Qtr 3	Qtr 4	Yield	Growth Rate	Equity Cost
	A	B	C	D	E	F	G	H = F+G
Bell Atlantic	51.181	0.385	0.385	0.385	0.385	3.2%	11.0%	14.2%
BellSouth	39.819	0.209	0.209	0.209	0.209	2.2%	10.0%	12.2%
SBC Communications	37.594	0.274	0.274	0.274	0.274	3.1%	12.5%	15.6%
GTE Corp	60.919	0.470	0.470	0.470	0.470	3.3%	11.7%	15.0%
Mean								**14.3%**

Notes:

Expected dividends (current and future payments) are based upon historical increase patterns for each company

Dividend Yield is taken from the quarterly DCF calculation

$$\frac{D(1+K)^{.75} + D(1+K)^{.50} + D(1+K)^{.25} + D(1+K)^{0}}{\text{Price}}$$

10-day average closing prices from Microsoft Investor Web Site (for the period 2/15/00 thru 2/29/00)

Growth rate from Institutional Brokers Estimate System (IBES)

DCF Model
Comparable Risk Companies

Company	Price	Expected Dividends Qtr 1	Qtr 2	Qtr 3	Qtr 4	Yield	Growth Rate	Equity Cost
	A	B	C	D	E	F	G	H = F+G
Abbott Laboratories	33.213	0.190	0.190	0.190	0.190	2.4%	12.0%	14.4%
Albertsons	26.200	0.205	0.205	0.205	0.205	3.3%	14.0%	17.3%
Anheuser-Busch Cos	61.325	0.300	0.300	0.330	0.330	2.1%	10.0%	12.1%
Brown-Forman Cl B	49.388	0.310	0.310	0.310	0.339	2.7%	9.3%	12.0%
Deluxe Corp	23.463	0.370	0.370	0.370	0.370	6.7%	12.0%	18.7%
Dover Corp	38.250	0.115	0.115	0.131	0.131	1.4%	14.0%	15.4%
Dow Jones & Co	61.432	0.250	0.250	0.250	0.250	1.7%	11.0%	12.7%
DPL Inc	20.907	0.235	0.235	0.235	0.235	4.7%	6.0%	10.7%
Duke Energy	49.831	0.550	0.550	0.550	0.550	4.6%	9.0%	13.6%
Electronic Data Systems	68.338	0.150	0.150	0.150	0.150	0.9%	15.5%	16.4%
Emerson Electric	48.244	0.358	0.358	0.358	0.396	3.2%	10.8%	14.0%
FPL Group	39.575	0.540	0.540	0.540	0.540	5.7%	6.0%	11.7%
Gannett Co	63.642	0.210	0.210	0.235	0.235	1.5%	12.0%	13.5%
Gillette Co	36.922	0.148	0.170	0.170	0.170	1.9%	15.0%	16.9%
Illinois Tool Works	56.057	0.180	0.180	0.203	0.203	1.4%	13.0%	14.4%
International Bus. Mach.	110.763	0.120	0.136	0.136	0.136	0.5%	13.0%	13.5%
IPALCO Enterprises	17.031	0.160	0.160	0.160	0.160	3.9%	6.5%	10.4%
Johnson & Johnson	76.138	0.280	0.316	0.316	0.316	1.7%	13.0%	14.7%
Leggett & Platt Inc	16.400	0.100	0.100	0.100	0.100	2.6%	15.0%	17.6%
Eli Lilly and Company	59.313	0.260	0.260	0.260	0.260	1.9%	15.0%	16.9%
MBIA Inc	38.663	0.205	0.205	0.230	0.230	2.4%	12.0%	14.4%
McDonalds Corp	32.356	0.000	0.000	0.000	0.220	0.7%	12.5%	13.2%
Minnesota Mining Mfg Co	88.844	0.580	0.580	0.580	0.580	2.7%	11.0%	13.7%
Northern States Power	18.100	0.363	0.384	0.384	0.384	8.8%	6.0%	14.8%
OGE Energy Corp	18.444	0.333	0.333	0.333	0.333	7.5%	4.5%	12.0%
Otter Tail Power	37.845	0.510	0.510	0.510	0.510	5.6%	5.0%	10.6%
Pitney Bowes Inc	50.044	0.285	0.285	0.285	0.285	2.4%	14.0%	16.4%
Vulcan Materials	41.088	0.210	0.210	0.210	0.210	2.2%	12.0%	14.2%
Washington Post Cl B	490.088	1.350	1.350	1.350	1.485	1.2%	10.0%	11.2%
WPS Resources Corp	24.525	0.505	0.505	0.519	0.519	8.7%	2.8%	11.5%
Mean								**14.0%**
Truncated Mean (Eliminate the High and Low Estimates)								**13.9%**

Notes:
Expected dividends (current and future payments) are based upon historical increase patterns for each company
Dividend Yield is from the quarterly DCF formula: $\frac{D(1+K)^{.75} + D(1+K)^{.50} + D(1+K)^{.25} + D(1+K)^{0}}{\text{Price}}$

10-day average closing prices from Microsoft Investor Web Site for the period 2/15/00 through 2/29/00
Growth Rates are from IBES.

CAPM - Intermediate Term Bonds
Telephone Companies

Company	Risk Free Rate A	Average Beta B	Market Risk Premium C	Beta x MRP D = BxC	Equity Cost E = A+D
Bell Atlantic	6.57%	0.81	8.9%	7.2%	13.8%
BellSouth	6.57%	0.72	8.9%	6.4%	13.0%
SBC Communications	6.57%	0.84	8.9%	7.5%	14.1%
GTE Corp	6.57%	0.84	8.9%	7.5%	14.1%
	Mean	0.80			**13.8%**

Notes: The CAPM cost of equity estimate formula is:
K = Risk Free Rate + (Beta x Market Risk Premium)
Risk Free rate is the average of the 3-yr, 5-yr, and 10-yr
U.S. Treasury bond yields from the Federal Reserve
Statistical Release -- the H15 Report
(For the period 2/15/00 through 2/29/00)
Beta is average of Merrill Lynch and Value Line.
Market Risk Premium is an average of Ex-Post/Ex-Ante risk premiums.
EX-POST is the arithmetic mean risk premium for
Market Results 1926-1999 from Ibbotson Associates
(Stocks, Bonds, Bills & Inflation 2000 Yearbook)
EX-ANTE risk premium is the current S&P DCF equity
estimate minus the intermed. term Treasury bond yields

CAPM - Long Term Bonds
Telephone Companies

Company	Risk Free Rate A	Average Beta B	Market Risk Premium C	Beta x MRP D = BxC	Equity Cost E = A+D
Bell Atlantic	6.18%	0.81	8.9%	7.2%	13.4%
BellSouth	6.18%	0.72	8.9%	6.4%	12.6%
SBC Communications	6.18%	0.84	8.9%	7.5%	13.7%
GTE Corp	6.18%	0.84	8.9%	7.5%	13.7%
	Mean	0.80			**13.4%**

Notes: The CAPM cost of equity estimate formula is:
K = Risk Free Rate + (Beta x Market Risk Premium)
Risk Free rate is the 30 year U.S. Treasury bond yield from the Federal Reserve Statistical Release -- the H15 Report (For the period 2/15/00 through 2/29/00)
Beta is average of Merrill Lynch and Value Line.
Market Risk Premium is an average of Ex-Post/Ex-Ante risk premiums.
EX-POST is the arithmetic mean risk premium for Market Results 1926-1999 from Ibbotson Associates (Stocks, Bonds, Bills & Inflation 2000 Yearbook)
EX-ANTE risk premium is the current S&P DCF equity estimate minus the long term Treasury bond yield.

CAPM - Intermediate Term Bonds
Comparable Risk Companies

Company	Risk Free Rate	Average Beta	Market Risk Premium	Beta x MRP	Equity Cost
	A	B	C	D = BxC	E = A+D
Abbott Laboratories	6.57%	0.94	8.9%	8.4%	15.0%
Albertsons	6.57%	0.59	8.9%	5.3%	11.9%
Anheuser-Busch Cos	6.57%	0.71	8.9%	6.3%	12.9%
Brown-Foreman Cl B	6.57%	0.75	8.9%	6.7%	13.3%
Deluxe Corp	6.57%	0.90	8.9%	8.0%	14.6%
Dover Corp	6.57%	0.88	8.9%	7.8%	14.4%
Dow Jones & Co	6.57%	0.78	8.9%	6.9%	13.5%
DPL Inc	6.57%	0.51	8.9%	4.5%	11.1%
Duke Energy	6.57%	0.41	8.9%	3.6%	10.2%
Electronic Data Systems	6.57%	1.02	8.9%	9.1%	15.7%
Emerson Electric	6.57%	0.87	8.9%	7.7%	14.3%
FPL Group	6.57%	0.43	8.9%	3.8%	10.4%
Gannett Co	6.57%	0.94	8.9%	8.4%	15.0%
Gillette Co	6.57%	1.03	8.9%	9.2%	15.8%
Illinois Tool Works	6.57%	1.05	8.9%	9.3%	15.9%
International Bus. Mach.	6.57%	1.03	8.9%	9.2%	15.8%
IPALCO Enterprises	6.57%	0.40	8.9%	3.6%	10.2%
Johnson & Johnson	6.57%	0.97	8.9%	8.6%	15.2%
Leggett & Platt Inc	6.57%	1.15	8.9%	10.2%	16.8%
Eli Lilly and Company	6.57%	0.98	8.9%	8.7%	15.3%
MBIA Inc	6.57%	1.05	8.9%	9.3%	15.9%
McDonalds Corp	6.57%	0.84	8.9%	7.5%	14.1%
Minnesota Mining Mfg Co	6.57%	0.81	8.9%	7.2%	13.8%
Northern States Power	6.57%	0.53	8.9%	4.7%	11.3%
OGE Energy Corp	6.57%	0.38	8.9%	3.4%	10.0%
Otter Tail Power	6.57%	0.50	8.9%	4.5%	11.1%
Pitney Bowes Inc	6.57%	0.87	8.9%	7.7%	14.3%
Vulcan Materials	6.57%	0.76	8.9%	6.8%	13.4%
Washington Post Cl B	6.57%	0.71	8.9%	6.3%	12.9%
WPS Resources Corp	6.57%	0.50	8.9%	4.5%	11.1%
	Mean	0.78			**13.5%**
	Truncated Mean				**13.5%**
	(Eliminate the High and Low Estimates)				

Notes:
The CAPM cost of equity estimate formula is: K= Risk Free Rate + (Beta x Market Risk Premium)
Risk Free rate is the average of the 3-yr, 5-yr, and 10-yr U.S. Treasury bond yields from Federal Reserve Statistical Release -- the H15 Report (For the period 2/15/00 through 2/29/00)
Beta is average of Merrill Lynch and Value Line.
Market Risk Premium is an average of Ex-Post/Ex-Ante risk premiums.
EX-POST is the arithmetic mean risk premium for 1926-1999 from Ibbotson Associates 2000 Yearbook
EX-ANTE risk premium is the current S&P DCF equity estimate minus the intermediate term Treasury bondyields

CAPM - Long Term Bonds
Comparable Risk Companies

Company	Risk Free Rate A	Average Beta B	Market Risk Premium C	Beta x MRP D = BxC	Equity Cost E = A+D
Abbott Laboratories	6.18%	0.94	8.9%	8.4%	14.6%
Albertsons	6.18%	0.59	8.9%	5.3%	11.5%
Anheuser-Busch Cos	6.18%	0.71	8.9%	6.3%	12.5%
Brown-Foreman Cl B	6.18%	0.75	8.9%	6.7%	12.9%
Deluxe Corp	6.18%	0.90	8.9%	8.0%	14.2%
Dover Corp	6.18%	0.88	8.9%	7.8%	14.0%
Dow Jones & Co	6.18%	0.78	8.9%	6.9%	13.1%
DPL Inc	6.18%	0.51	8.9%	4.5%	10.7%
Duke Energy	6.18%	0.41	8.9%	3.6%	9.8%
Electronic Data Systems	6.18%	1.02	8.9%	9.1%	15.3%
Emerson Electric	6.18%	0.87	8.9%	7.7%	13.9%
FPL Group	6.18%	0.43	8.9%	3.8%	10.0%
Gannett Co	6.18%	0.94	8.9%	8.4%	14.6%
Gillette Co	6.18%	1.03	8.9%	9.2%	15.4%
Illinois Tool Works	6.18%	1.05	8.9%	9.3%	15.5%
International Bus. Mach.	6.18%	1.03	8.9%	9.2%	15.4%
IPALCO Enterprises	6.18%	0.40	8.9%	3.6%	9.8%
Johnson & Johnson	6.18%	0.97	8.9%	8.6%	14.8%
Leggett & Platt Inc	6.18%	1.15	8.9%	10.2%	16.4%
Eli Lilly and Company	6.18%	0.98	8.9%	8.7%	14.9%
MBIA Inc	6.18%	1.05	8.9%	9.3%	15.5%
McDonalds Corp	6.18%	0.84	8.9%	7.5%	13.7%
Minnesota Mining Mfg Co	6.18%	0.81	8.9%	7.2%	13.4%
Northern States Power	6.18%	0.53	8.9%	4.7%	10.9%
OGE Energy Corp	6.18%	0.38	8.9%	3.4%	9.6%
Otter Tail Power	6.18%	0.50	8.9%	4.5%	10.7%
Pitney Bowes Inc	6.18%	0.87	8.9%	7.7%	13.9%
Vulcan Materials	6.18%	0.76	8.9%	6.8%	13.0%
Washington Post Cl B	6.18%	0.71	8.9%	6.3%	12.5%
WPS Resources Corp	6.18%	0.50	8.9%	4.5%	10.7%
	Mean	0.78			**13.1%**
	Truncated Mean				**13.1%**
	(Eliminate the High and Low Estimates)				

Notes:
The CAPM cost of equity estimate formula is: K= Risk Free Rate + (Beta x Market Risk Premium)
Risk Free rate is the average of the 30yr U.S. Treasury bond yields from Federal Reserve
Statistical Release -- the H15 Report (For the period 2/15/00 through 2/29/00)
Beta is average of Merrill Lynch and Value Line.
Market Risk Premium is an average of Ex-Post/Ex-Ante risk premiums.
EX-POST is the arithmetic mean risk premium for 1926-1999 from Ibbotson Associates 2000 Yearbook
EX-ANTE risk premium is the current S&P DCF equity estimate minus the intermediate term Treasury bondyields

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

Source: S&P Compustat Data Base
Source Date: February 29, 2000

S&P Company Name	Current Dividend A	Current Price B	Expected Dividend Yield C= (calc)	Expected IBES LT Growth D	Market Required Return (Div Yld+Growth) E = C + D
ABBOTT LABORATORIES	0.680	33.000	2.2%	12.0%	14.2%
ADOBE SYSTEMS INC	0.100	102.000	0.1%	20.0%	20.1%
AETNA INC	0.800	41.125	2.1%	14.5%	16.6%
AFLAC INC	0.300	36.562	0.9%	15.0%	15.9%
AIR PRODUCTS & CHEMICALS INC	0.720	25.750	3.0%	11.5%	14.5%
ALBERTO-CULVER CO -CL B	0.260	21.375	1.3%	11.0%	12.3%
ALBERTSONS INC	0.720	24.500	3.1%	14.0%	17.1%
ALCAN ALUMINIUM LTD	0.600	33.000	1.9%	7.0%	8.9%
ALCOA INC	0.805	68.500	1.2%	9.5%	10.7%
ALLEGHENY TECHNOLOGIES INC	1.280	16.938	8.0%	12.0%	20.0%
ALLERGAN INC	0.280	50.312	0.6%	18.5%	19.1%
ALLSTATE CORP	0.600	19.688	3.2%	10.0%	13.2%
ALLTEL CORP	1.280	58.000	2.4%	15.0%	17.4%
AMERADA HESS CORP	0.600	50.562	1.2%	5.0%	6.2%
AMEREN CORP	2.540	30.000	8.6%	3.0%	11.6%
AMERICAN ELECTRIC POWER	2.400	28.125	8.7%	3.0%	11.7%
AMERICAN EXPRESS	0.900	134.188	0.7%	14.0%	14.7%
AMERICAN GENERAL CORP	1.600	52.188	3.2%	12.0%	15.2%
AMERICAN GREETINGS -CL A	0.800	17.250	4.9%	10.0%	14.9%
AMERICAN HOME PRODUCTS CORF	0.900	43.500	2.2%	12.5%	14.7%
AMERICAN INTERNATIONAL GROUF	0.200	88.438	0.2%	14.0%	14.2%
AMSOUTH BANCORPORATION	0.800	14.312	5.9%	10.0%	15.9%
ANADARKO PETROLEUM CORP	0.200	30.750	0.7%	15.0%	15.7%
ANHEUSER-BUSCH COS INC	1.200	64.000	2.0%	10.0%	12.0%
AON CORP	0.840	21.062	4.2%	12.0%	16.2%
APACHE CORP	0.280	36.500	0.8%	13.5%	14.3%
ARCHER-DANIELS-MIDLAND CO	0.200	10.062	2.1%	10.5%	12.6%
ARMSTRONG WORLD INDS INC	1.920	19.000	10.6%	10.0%	20.6%
ASHLAND INC	1.100	31.125	3.7%	8.0%	11.7%
ASSOC FST CAPITAL CP -CL A	0.260	19.875	1.4%	16.0%	17.4%
AT&T CORP	0.880	49.375	1.9%	13.0%	14.9%
ATLANTIC RICHFIELD CO	2.850	71.000	4.2%	9.0%	13.2%
AUTODESK INC	0.240	44.688	0.6%	18.0%	18.6%
AUTOMATIC DATA PROCESSING	0.350	43.562	0.9%	15.0%	15.9%
AVERY DENNISON CORP	1.080	60.688	1.9%	13.0%	14.9%
AVON PRODUCTS	0.720	27.062	2.8%	13.0%	15.8%
BAKER-HUGHES INC	0.460	25.875	1.9%	15.0%	16.9%
BALL CORP	0.600	26.812	2.4%	12.0%	14.4%
BANK OF AMERICA CORP	2.000	46.000	4.6%	12.0%	16.6%
BANK OF NEW YORK CO INC	0.640	33.250	2.0%	12.0%	14.0%
BANK ONE CORP	1.680	25.875	6.9%	12.0%	18.9%
BARD (C.R.) INC	0.800	39.500	2.1%	12.0%	14.1%

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

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Source Date: February 29, 2000

S&P Company Name	Current Dividend A	Current Price B	Expected Dividend Yield C= (calc)	Expected IBES LT Growth D	Market Required Return (Div Yld+Growth) E = C + D
BARRICK GOLD CORPORATION	0.200	16.312	1.3%	10.0%	11.3%
BAUSCH & LOMB INC	1.040	52.750	2.1%	15.0%	17.1%
BAXTER INTERNATIONAL INC	1.164	54.500	2.3%	13.0%	15.3%
BB&T CORP	0.800	23.500	3.6%	12.0%	15.6%
BEAR STEARNS COMPANIES INC	0.571	39.250	1.5%	12.5%	14.0%
BECTON DICKINSON & CO	0.370	31.000	1.3%	13.0%	14.3%
BELL ATLANTIC CORP	1.540	48.938	3.3%	11.0%	14.3%
BELLSOUTH CORP	0.760	40.562	2.0%	10.0%	12.0%
BEMIS CO	0.920	29.750	3.3%	12.0%	15.3%
BESTFOODS	1.060	41.938	2.7%	10.0%	12.7%
BIOMET INC	0.140	33.000	0.5%	15.0%	15.5%
BLACK & DECKER CORP	0.480	32.938	1.6%	15.0%	16.6%
BLOCK H & R INC	1.100	43.875	2.7%	15.0%	17.7%
BOEING CO	0.560	36.938	1.6%	15.0%	16.6%
BOISE CASCADE CORP	0.600	29.812	2.0%	3.0%	5.0%
BRIGGS & STRATTON	1.200	33.438	3.7%	8.0%	11.7%
BRISTOL MYERS SQUIBB	0.860	57.250	1.6%	13.0%	14.6%
BROWN-FORMAN -CL B	1.240	47.625	2.7%	9.3%	12.0%
BRUNSWICK CORP	0.500	17.688	3.0%	12.5%	15.5%
BURLINGTON RESOURCES INC	0.550	27.625	2.1%	15.0%	17.1%
CAMPBELL SOUP CO	0.900	28.375	3.3%	10.0%	13.3%
CAPITAL ONE FINL CORP	0.107	36.812	0.3%	23.0%	23.3%
CARDINAL HEALTH INC	0.100	41.812	0.3%	20.0%	20.3%
CARNIVAL CORP	0.420	28.812	1.6%	16.4%	18.0%
CAROLINA POWER & LIGHT	2.000	29.750	6.9%	5.0%	11.9%
CATERPILLAR INC	1.300	35.062	3.9%	10.0%	13.9%
CENTEX CORP	0.160	19.688	0.9%	12.5%	13.4%
CENTRAL & SOUTH WEST CORP	1.740	16.812	10.5%	3.0%	13.5%
CENTURYTEL INC	0.180	33.625	0.6%	15.0%	15.6%
CHAMPION INTERNATIONAL CORP	0.400	51.750	0.8%	5.5%	6.3%
CHASE MANHATTAN CORP	1.640	79.625	2.2%	12.0%	14.2%
CHEVRON CORP	2.600	74.688	3.6%	8.0%	11.6%
CHUBB CORP	1.280	49.188	2.8%	12.0%	14.8%
CIGNA CORP	1.200	73.812	1.7%	13.0%	14.7%
CINCINNATI FINANCIAL CORP	0.680	29.875	2.4%	8.0%	10.4%
CINERGY CORP	1.800	21.375	8.6%	4.0%	12.6%
CIRCUIT CITY STR CRCT CTY GP	0.070	40.438	0.2%	18.0%	18.2%
CITIGROUP INC	0.560	51.812	1.2%	13.5%	14.7%
CLOROX CO/DE	0.800	40.438	2.1%	13.0%	15.1%
CMS ENERGY CORP	1.460	16.750	9.2%	10.0%	19.2%
COASTAL CORP	0.250	42.062	0.6%	12.0%	12.6%
COCA-COLA CO	0.640	48.625	1.4%	14.0%	15.4%

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

Source: S&P Compustat Data Base
Source Date: February 29, 2000

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COCA-COLA ENTERPRISES	0.160	23.375	0.8%	22.5%	23.3%
COLGATE-PALMOLIVE CO	0.630	52.188	1.3%	13.0%	14.3%
COLUMBIA ENERGY GROUP	0.900	59.000	1.6%	10.5%	12.1%
COLUMBIA/HCA HLTHCR -VTG	0.080	19.312	0.4%	15.0%	15.4%
COMCAST CORP -CL A SPL	0.047	42.500	0.1%	15.5%	15.6%
COMERICA INC	1.440	36.812	4.1%	11.0%	15.1%
COMPAQ COMPUTER CORP	0.100	25.125	0.4%	20.0%	20.4%
COMPUTER ASSOCIATES INTL INC	0.080	64.250	0.1%	16.5%	16.6%
CONAGRA INC	0.814	16.375	5.2%	11.0%	16.2%
CONOCO INC	0.760	19.688	4.0%	7.5%	11.5%
CONSECO INC	0.600	14.625	4.4%	15.0%	19.4%
CONSOLIDATED EDISON INC	2.140	27.562	7.9%	3.5%	11.4%
CONSTELLATION ENERGY CORP	1.680	29.750	5.8%	5.0%	10.8%
COOPER INDUSTRIES INC	1.320	30.250	4.6%	10.0%	14.6%
COOPER TIRE & RUBBER	0.420	10.812	4.1%	9.0%	13.1%
COORS (ADOLPH) -CL B	0.660	43.875	1.6%	10.0%	11.6%
CORNING INC	0.720	188.000	0.4%	17.0%	17.4%
COUNTRYWIDE CREDIT IND INC	0.400	24.938	1.7%	13.0%	14.7%
CRANE CO	0.400	19.875	2.1%	12.0%	14.1%
CROWN CORK & SEAL CO INC	1.000	14.000	7.5%	10.0%	17.5%
CSX CORP	1.200	22.188	5.7%	10.0%	15.7%
CUMMINS ENGINE	1.200	33.312	3.7%	8.0%	11.7%
CVS CORP	0.230	35.000	0.7%	17.0%	17.7%
DANA CORP	1.240	21.375	6.1%	11.0%	17.1%
DANAHER CORP	0.060	40.812	0.2%	16.0%	16.2%
DARDEN RESTAURANTS INC	0.080	13.188	0.6%	11.5%	12.1%
DEERE & CO	0.880	35.750	2.6%	10.0%	12.6%
DELPHI AUTOMOTIVE SYS CORP	0.280	16.688	1.8%	10.0%	11.8%
DELTA AIR LINES INC	0.100	45.625	0.2%	6.0%	6.2%
DELUXE CORP	1.480	23.438	6.7%	12.0%	18.7%
DILLARDS INC -CL A	0.160	17.375	1.0%	10.0%	11.0%
DISNEY (WALT) COMPANY	0.210	33.500	0.7%	15.0%	15.7%
DOLLAR GENERAL	0.128	20.938	0.7%	23.0%	23.7%
DOMINION RESOURCES INC	2.580	36.688	7.3%	7.5%	14.8%
DONNELLEY (R R) & SONS CO	0.880	19.125	4.9%	12.0%	16.9%
DOVER CORP	0.460	38.562	1.3%	14.0%	15.3%
DOW CHEMICAL	3.480	108.500	3.3%	8.0%	11.3%
DOW JONES & CO INC	0.960	62.375	1.6%	11.0%	12.6%
DTE ENERGY CO	2.060	30.188	7.0%	5.0%	12.0%
DU PONT (E I) DE NEMOURS	1.400	50.500	2.9%	10.0%	12.9%
DUKE ENERGY CORP	2.200	48.500	4.7%	9.0%	13.7%
DUN & BRADSTREET CORP	0.740	26.188	3.0%	10.5%	13.5%

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

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EASTERN ENTERPRISES	1.720	57.875	3.1%	6.5%	9.6%
EASTMAN CHEMICAL CO	1.760	35.938	5.1%	8.0%	13.1%
EASTMAN KODAK CO	1.760	57.312	3.2%	10.0%	13.2%
EATON CORP	1.760	74.938	2.5%	10.0%	12.5%
ECOLAB INC	0.420	28.250	1.6%	15.0%	16.6%
EDISON INTERNATIONAL	1.080	26.250	4.3%	10.0%	14.3%
EL PASO ENERGY CORP/DE	0.800	37.062	2.3%	13.0%	15.3%
ELECTRONIC DATA SYSTEMS CORF	0.600	64.500	1.0%	15.5%	16.5%
EMERSON ELECTRIC CO	1.430	45.562	3.3%	10.8%	14.1%
ENGELHARD CORP	0.400	13.625	3.1%	12.8%	15.9%
ENRON CORP	0.500	68.750	0.8%	15.0%	15.8%
ENTERGY CORP	1.200	20.250	6.1%	5.0%	11.1%
EQUIFAX INC	0.370	21.188	1.9%	15.0%	16.9%
EXXON MOBIL CORP	1.760	75.312	2.4%	8.0%	10.4%
FANNIE MAE	1.080	53.000	2.2%	13.2%	15.4%
FIFTH THIRD BANCORP	0.960	52.062	2.0%	15.0%	17.0%
FIRST DATA CORP	0.080	45.000	0.2%	14.0%	14.2%
FIRST UNION CORP (N C)	1.880	29.500	6.7%	11.0%	17.7%
FIRSTAR CORP	0.650	17.812	3.9%	15.0%	18.9%
FIRSTENERGY CORP	1.500	18.500	8.3%	5.0%	13.3%
FLEETBOSTON FINANCIAL CORP	1.200	27.250	4.6%	11.0%	15.6%
FLORIDA PROGRESS CORP	2.180	42.625	5.2%	5.0%	10.2%
FLUOR CORP	1.000	28.438	3.7%	11.5%	15.2%
FORD MOTOR CO	2.000	41.625	5.0%	7.0%	12.0%
FORT JAMES CORP	0.600	18.812	3.4%	13.5%	16.9%
FORTUNE BRANDS INC	0.920	21.875	4.5%	11.9%	16.4%
FPL GROUP INC	2.080	38.625	5.5%	6.0%	11.5%
FRANKLIN RESOURCES INC	0.240	27.188	0.9%	14.0%	14.9%
FREEPRT MCMOR COP&GLD -CL B	0.200	13.750	1.6%	22.0%	23.6%
GANNETT CO	0.840	65.188	1.4%	12.0%	13.4%
GAP INC	0.089	48.312	0.2%	20.0%	20.2%
GENERAL DYNAMICS CORP	0.960	43.250	2.4%	12.0%	14.4%
GENERAL ELECTRIC CO	1.640	132.375	1.3%	14.0%	15.3%
GENERAL MILLS INC	1.100	32.938	3.5%	10.0%	13.5%
GENERAL MOTORS CORP	2.000	76.062	2.7%	7.0%	9.7%
GENUINE PARTS CO	1.040	22.562	4.8%	8.0%	12.8%
GEORGIA-PACIFIC GROUP	0.500	34.688	1.5%	7.0%	8.5%
GILLETTE CO	0.590	35.250	1.8%	15.0%	16.8%
GOLDEN WEST FINANCIAL CORP	0.210	28.500	0.8%	11.5%	12.3%
GOODRICH (B F) CO	1.100	23.938	4.9%	12.0%	16.9%
GOODYEAR TIRE & RUBBER CO	1.200	22.875	5.5%	8.0%	13.5%
GPU INC	2.120	24.875	8.7%	3.5%	12.2%

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Standard & Poor's 500 Companies

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GRAINGER (W W) INC	0.640	42.812	1.6%	12.3%	13.9%
GREAT ATLANTIC & PAC TEA CO	0.400	23.438	1.8%	12.0%	13.8%
GREAT LAKES CHEMICAL CORP	0.320	29.062	1.2%	11.5%	12.7%
GTE CORP	1.880	59.000	3.4%	11.7%	15.1%
GUIDANT CORP	0.025	67.375	0.0%	20.0%	20.0%
HALLIBURTON CO	0.500	38.188	1.4%	15.0%	16.4%
HARCOURT GENERAL INC	0.840	34.438	2.6%	15.0%	17.6%
HARLEY-DAVIDSON INC	0.180	68.125	0.3%	20.0%	20.3%
HARTFORD FINL SVCS GRP INC	0.960	31.250	3.2%	11.0%	14.2%
HASBRO INC	0.240	15.750	1.6%	14.5%	16.1%
HEINZ (H J) CO	1.470	31.938	4.8%	10.0%	14.8%
HERCULES INC	1.080	16.500	6.9%	10.5%	17.4%
HERSHEY FOODS CORP	1.040	43.938	2.5%	10.0%	12.5%
HEWLETT-PACKARD CO	0.640	134.500	0.5%	15.0%	15.5%
HILTON HOTELS CORP	0.080	7.000	1.2%	15.0%	16.2%
HOME DEPOT INC	0.160	57.812	0.3%	24.0%	24.3%
HOMESTAKE MINING	0.050	6.500	0.8%	18.5%	19.3%
HONEYWELL INTERNATIONAL INC	0.680	48.125	1.5%	15.0%	16.5%
HOUSEHOLD INTERNATIONAL INC	0.680	31.938	2.3%	15.0%	17.3%
HUNTINGTON BANCSHARES	0.800	20.875	4.0%	9.0%	13.0%
IKON OFFICE SOLUTIONS	0.160	7.000	2.4%	13.0%	15.4%
ILLINOIS TOOL WORKS	0.720	51.688	1.5%	13.0%	14.5%
IMS HEALTH INC	0.080	20.125	0.4%	20.0%	20.4%
INGERSOLL-RAND CO	0.680	38.312	1.9%	12.0%	13.9%
INTEL CORP	0.120	113.000	0.1%	20.0%	20.1%
INTERPUBLIC GROUP OF COS	0.340	40.188	0.9%	14.2%	15.1%
INTL BUSINESS MACHINES CORP	0.480	102.750	0.5%	13.0%	13.5%
INTL FLAVORS & FRAGRANCES	1.520	30.000	5.3%	9.0%	14.3%
INTL PAPER CO	1.000	36.812	2.8%	5.0%	7.8%
ITT INDUSTRIES INC	0.600	24.250	2.6%	13.8%	16.4%
JEFFERSON-PILOT CORP	1.320	52.062	2.7%	11.5%	14.2%
JOHNSON & JOHNSON	1.120	72.000	1.7%	13.0%	14.7%
JOHNSON CONTROLS INC	1.120	53.375	2.2%	14.0%	16.2%
JOSTENS INC	0.880	24.062	3.8%	10.0%	13.8%
KANSAS CITY SOUTHERN INDS	0.160	78.750	0.2%	15.5%	15.7%
KAUFMAN & BROAD HOME CORP	0.300	19.125	1.7%	15.0%	16.7%
KELLOGG CO	0.980	25.312	4.0%	9.0%	13.0%
KERR-MCGEE CORP	1.800	44.750	4.1%	5.0%	9.1%
KEYCORP	1.040	16.938	6.4%	10.0%	16.4%
KIMBERLY-CLARK CORP	1.040	51.500	2.1%	11.0%	13.1%
KNIGHT-RIDDER INC	0.920	46.875	2.1%	11.8%	13.9%
LEGGETT & PLATT INC	0.360	16.812	2.3%	15.0%	17.3%

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LEHMAN BROTHERS HOLDINGS INC	0.360	72.500	0.5%	11.0%	11.5%
LILLY (ELI) & CO	0.920	59.438	1.7%	15.0%	16.7%
LIMITED INC	0.600	34.000	1.9%	13.0%	14.9%
LINCOLN NATIONAL CORP	1.100	27.625	4.2%	12.0%	16.2%
LIZ CLAIBORNE INC	0.450	37.438	1.3%	11.0%	12.3%
LOCKHEED MARTIN CORP	0.880	17.438	5.3%	10.0%	15.3%
LOEWS CORP	1.000	44.500	2.4%	13.0%	15.4%
LONGS DRUG STORES INC	0.560	18.562	3.2%	10.0%	13.2%
LOUISIANA-PACIFIC CORP	0.560	11.812	5.0%	11.1%	16.1%
LOWES COS	0.140	47.812	0.3%	21.0%	21.3%
LUCENT TECHNOLOGIES INC	0.080	59.500	0.1%	20.0%	20.1%
MALLINCKRODT INC	0.660	24.625	2.8%	11.5%	14.3%
MARRIOTT INTL INC	0.220	27.562	0.9%	16.5%	17.4%
MARSH & MCLENNAN COS	1.800	77.375	2.5%	13.0%	15.5%
MASCO CORP	0.480	17.875	2.9%	15.0%	17.9%
MATTEL INC	0.360	9.625	4.0%	15.0%	19.0%
MAY DEPARTMENT STORES CO	0.890	26.188	3.6%	11.0%	14.6%
MAYTAG CORP	0.720	26.438	2.9%	13.0%	15.9%
MBIA INC	0.820	38.375	2.3%	12.0%	14.3%
MBNA CORP	0.280	22.875	1.3%	20.0%	21.3%
MCDONALDS CORP	0.195	31.625	0.7%	12.5%	13.2%
MCGRAW-HILL COMPANIES	0.860	50.875	1.8%	12.0%	13.8%
MCKESSON HBOC INC	0.240	19.375	1.4%	18.0%	19.4%
MEAD CORP	0.680	29.938	2.4%	9.0%	11.4%
MEDTRONIC INC	0.160	48.438	0.4%	18.0%	18.4%
MELLON FINANCIAL CORP	0.800	30.125	2.8%	12.0%	14.8%
MERCK & CO	1.160	61.562	2.0%	12.0%	14.0%
MEREDITH CORP	0.300	28.625	1.1%	13.0%	14.1%
MERRILL LYNCH & CO	1.080	102.500	1.1%	12.0%	13.1%
MGIC INVESTMENT CORP/WI	0.100	37.375	0.3%	13.0%	13.3%
MILACRON INC	0.480	13.875	3.7%	12.0%	15.7%
MILLIPORE CORP	0.440	53.438	0.9%	15.0%	15.9%
MINNESOTA MINING & MFG CO	2.240	88.188	2.7%	11.0%	13.7%
MOLEX INC	0.100	55.875	0.2%	16.0%	16.2%
MONSANTO CO	0.120	38.812	0.3%	20.0%	20.3%
MORGAN (J P) & CO	4.000	111.188	3.8%	9.5%	13.3%
MORGAN STANLEY DEAN WITTER	0.480	70.438	0.7%	14.0%	14.7%
MOTOROLA INC	0.480	170.375	0.3%	20.0%	20.3%
NABISCO GROUP HLDGS CORP	0.490	8.625	6.0%	9.5%	15.5%
NATIONAL CITY CORP	1.080	19.250	5.9%	10.0%	15.9%
NATIONAL SERVICE INDS INC	1.280	20.625	6.5%	10.0%	16.5%
NEW CENTURY ENERGIES INC	2.320	27.062	8.8%	5.0%	13.8%

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

Source: S&P Compustat Data Base
Source Date: February 29, 2000

S&P Company Name	Current Dividend A	Current Price B	Expected Dividend Yield C= (calc)	Expected IBES LT Growth D	Market Required Return (Div Yld+Growth) E = C + D
NEW YORK TIMES CO -CL A	0.420	42.250	1.1%	13.0%	14.1%
NEWELL RUBBERMAID INC	0.800	23.250	3.7%	15.0%	18.7%
NEWMONT MINING CORP	0.120	22.125	0.6%	20.0%	20.6%
NICOR INC	1.560	30.375	5.3%	6.0%	11.3%
NIKE INC -CL B	0.480	28.438	1.8%	15.0%	16.8%
NORDSTROM INC	0.320	21.312	1.6%	15.0%	16.6%
NORFOLK SOUTHERN CORP	0.800	13.562	6.2%	10.5%	16.7%
NORTEL NETWORKS CORP	0.150	115.781	0.1%	20.0%	20.1%
NORTHERN STATES POWER/MN	1.450	17.562	8.5%	6.0%	14.5%
NORTHERN TRUST CORP	0.540	56.500	1.0%	12.0%	13.0%
NORTHROP GRUMMAN CORP	1.600	45.438	3.7%	9.0%	12.7%
NUCOR CORP	0.520	49.688	1.1%	15.0%	16.1%
OCCIDENTAL PETROLEUM CORP	1.000	16.062	6.6%	12.0%	18.6%
OLD KENT FINANCIAL CORP	0.880	26.188	3.5%	11.0%	14.5%
OMNICOM GROUP	0.700	94.188	0.8%	15.8%	16.6%
OWENS CORNING	0.300	14.500	2.2%	10.0%	12.2%
PACCAR INC	0.800	43.062	1.9%	9.5%	11.4%
PAINE WEBBER GROUP	0.440	38.250	1.2%	10.5%	11.7%
PALL CORP	0.640	19.750	3.5%	14.5%	18.0%
PARKER-HANNIFIN CORP	0.680	36.250	2.0%	12.0%	14.0%
PAYCHEX INC	0.360	50.062	0.8%	27.0%	27.8%
PE CORP BIOSYSTEMS	0.170	105.000	0.2%	23.5%	23.7%
PECO ENERGY CO	1.000	37.312	2.8%	8.0%	10.8%
PENNEY (J C) CO	1.150	15.750	7.7%	10.0%	17.7%
PEOPLES ENERGY CORP	1.960	28.938	6.9%	4.5%	11.4%
PEP BOYS-MANNY MOE & JACK	0.270	6.188	4.7%	15.0%	19.7%
PEPSICO INC	0.540	32.125	1.8%	13.0%	14.8%
PERKINELMER INC	0.560	64.625	0.9%	15.0%	15.9%
PFIZER INC	0.320	32.125	1.1%	19.0%	20.1%
PG&E CORP	1.200	20.625	6.0%	7.0%	13.0%
PHARMACIA & UPJOHN INC	1.080	47.625	2.4%	13.0%	15.4%
PHELPS DODGE CORP	2.000	47.125	4.4%	6.5%	10.9%
PHILIP MORRIS COS INC	1.920	20.188	10.1%	12.0%	22.1%
PHILLIPS PETROLEUM CO	1.360	38.125	3.7%	9.0%	12.7%
PINNACLE WEST CAPITAL	1.400	27.625	5.2%	6.0%	11.2%
PITNEY BOWES INC	1.020	49.500	2.2%	14.0%	16.2%
PLACER DOME INC	0.100	8.750	1.2%	10.0%	11.2%
PNC BANK CORP	1.800	38.688	4.9%	10.0%	14.9%
POLAROID CORP	0.600	25.062	2.5%	10.0%	12.5%
POTLATCH CORP	1.740	38.000	4.7%	7.0%	11.7%
PPG INDUSTRIES INC	1.520	49.375	3.2%	9.5%	12.7%
PPL CORP	1.000	20.125	5.1%	3.5%	8.6%

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

Source: S&P Compustat Data Base
Source Date: February 29, 2000

S&P Company Name	Current Dividend A	Current Price B	Expected Dividend Yield C= (calc)	Expected IBES LT Growth D	Market Required Return (Div Yld+Growth) E = C + D
PRAXAIR INC	0.560	33.750	1.8%	12.0%	13.8%
PRICE (T. ROWE) ASSOCIATES	0.400	32.938	1.3%	15.0%	16.3%
PROCTER & GAMBLE CO	1.210	87.875	1.5%	13.0%	14.5%
PROGRESSIVE CORP-OHIO	0.260	59.500	0.5%	15.0%	15.5%
PROVIDIAN FINANCIAL CORP	0.200	64.688	0.3%	25.0%	25.3%
PUBLIC SERVICE ENTRP	2.160	29.000	7.6%	5.0%	12.6%
PULTE CORP	0.160	16.812	1.0%	10.0%	11.0%
QUAKER OATS CO	1.140	53.938	2.2%	10.0%	12.2%
RALSTON PURINA CO	0.400	28.312	1.5%	11.0%	12.5%
RAYTHEON CO -CL B	0.800	18.500	4.5%	10.0%	14.5%
REGIONS FINL CORP	1.000	20.250	5.2%	10.0%	15.2%
RELIANT ENERGY INC	1.500	20.562	7.6%	8.0%	15.6%
REYNOLDS METALS CO	1.400	63.500	2.3%	9.0%	11.3%
RITE AID CORP	0.460	6.875	7.1%	13.0%	20.1%
ROCKWELL INTL CORP	1.020	45.250	2.4%	12.0%	14.4%
ROHM & HAAS CO	0.760	40.250	2.0%	10.0%	12.0%
ROYAL DUTCH PET -NY REG	2.296	52.750	4.6%	10.0%	14.6%
RUSSELL CORP	0.560	13.812	4.3%	12.0%	16.3%
RYDER SYSTEM INC	0.600	18.500	3.4%	12.0%	15.4%
SAFECO CORP	1.480	21.000	7.4%	10.0%	17.4%
SARA LEE CORP	0.540	14.875	3.8%	11.0%	14.8%
SBC COMMUNICATIONS INC	0.975	38.062	2.7%	12.5%	15.2%
SCHERING-PLOUGH	0.500	35.000	1.5%	16.0%	17.5%
SCHLUMBERGER LTD	0.750	73.859	1.1%	20.0%	21.1%
SCHWAB (CHARLES) CORP	0.056	41.875	0.2%	25.0%	25.2%
SCIENTIFIC-ATLANTA INC	0.060	102.688	0.1%	21.0%	21.1%
SEAGRAM CO LTD	0.449	58.750	0.8%	15.0%	15.8%
SEARS ROEBUCK & CO	0.920	27.562	3.5%	10.0%	13.5%
SEMPRA ENERGY	1.560	18.000	8.9%	5.0%	13.9%
SERVICE CORP INTERNATIONAL	0.360	3.688	10.3%	11.0%	21.3%
SHARED MEDICAL SYSTEMS CORP	0.840	38.938	2.4%	20.0%	22.4%
SHERWIN-WILLIAMS CO	0.480	19.125	2.7%	12.0%	14.7%
SIGMA-ALDRICH	0.310	23.750	1.4%	12.0%	13.4%
SLM HLDG CORP	0.640	31.312	2.2%	13.0%	15.2%
SNAP-ON INC	0.920	21.812	4.4%	11.0%	15.4%
SOUTHERN CO	1.340	22.188	6.2%	6.0%	12.2%
SOUTHTRUST CORP	0.880	22.938	4.0%	11.0%	15.0%
SOUTHWEST AIRLINES	0.022	18.438	0.1%	13.5%	13.6%
SPRINGS INDUSTRIES -CL A	1.320	35.438	3.9%	9.0%	12.9%
SPRINT FON GROUP	0.500	61.000	0.9%	12.0%	12.9%
ST PAUL COS	1.040	22.375	4.9%	10.0%	14.9%
STANLEY WORKS	0.880	23.000	4.0%	11.0%	15.0%

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

Source: S&P Compustat Data Base
Source Date: February 29, 2000

S&P Company Name	Current Dividend A	Current Price B	Expected Dividend Yield C= (calc)	Expected IBES LT Growth D	Market Required Return (Div Yld+Growth) E = C + D
STATE STREET CORP	0.640	72.875	0.9%	14.4%	15.3%
SUMMIT BANCORP	1.320	23.938	5.8%	9.0%	14.8%
SUNOCO INC	1.000	24.688	4.2%	7.5%	11.7%
SUNTRUST BANKS INC	1.380	50.812	2.9%	12.0%	14.9%
SUPERVALU INC	0.540	17.188	3.3%	12.0%	15.3%
SYNOVUS FINANCIAL CP	0.360	16.375	2.4%	14.3%	16.7%
SYSCO CORP	0.400	32.812	1.3%	13.0%	14.3%
TANDY CORP	0.220	38.000	0.6%	18.0%	18.6%
TARGET CORP	0.400	59.000	0.7%	15.0%	15.7%
TEKTRONIX INC	0.480	58.000	0.9%	13.5%	14.4%
TEMPLE-INLAND INC	1.280	51.125	2.6%	7.0%	9.6%
TEXACO INC	1.800	47.438	3.9%	8.0%	11.9%
TEXAS INSTRUMENTS INC	0.170	166.125	0.1%	22.0%	22.1%
TEXAS UTILITIES CO	2.400	32.625	7.6%	6.0%	13.6%
TEXTRON INC	1.300	61.000	2.3%	13.5%	15.8%
THOMAS & BETTS CORP	1.120	22.438	5.3%	13.0%	18.3%
TIME WARNER INC	0.180	85.250	0.2%	12.0%	12.2%
TIMES MIRROR COMPANY -SER A	0.800	51.000	1.7%	11.0%	12.7%
TIMKEN CO	0.720	14.312	5.3%	10.0%	15.3%
TJX COMPANIES INC	0.140	15.938	1.0%	16.5%	17.5%
TORCHMARK CORP	0.360	19.812	1.9%	10.5%	12.4%
TOSCO CORP	0.280	26.750	1.1%	11.0%	12.1%
TRANSOCEAN SEDCO FOREX INC	0.120	39.438	0.3%	16.5%	16.8%
TRIBUNE CO	0.360	38.938	1.0%	13.0%	14.0%
TRW INC	1.320	48.000	2.9%	10.0%	12.9%
TUPPERWARE CORP	0.880	17.188	5.4%	11.0%	16.4%
TYCO INTERNATIONAL LTD	0.050	37.875	0.1%	20.0%	20.1%
U S BANCORP/DE	0.780	18.312	4.5%	12.0%	16.5%
U S WEST INC	2.140	72.625	3.0%	7.0%	10.0%
UNICOM CORP	1.600	37.812	4.4%	7.0%	11.4%
UNILEVER N V -NY SHARES	1.180	45.500	2.7%	10.8%	13.5%
UNION CARBIDE CORP	0.900	53.688	1.8%	10.0%	11.8%
UNION PACIFIC CORP	0.800	38.000	2.2%	10.0%	12.2%
UNION PACIFIC RESOURCES GRP	0.200	8.938	2.4%	10.8%	13.2%
UNION PLANTERS CORP	2.000	27.375	7.6%	7.5%	15.1%
UNITED HEALTHCARE CORP	0.030	51.125	0.1%	15.0%	15.1%
UNITED TECHNOLOGIES CORP	0.800	50.938	1.7%	15.0%	16.7%
UNOCAL CORP	0.800	26.750	3.1%	8.0%	11.1%
UNUMPROVIDENT CORP	0.590	13.375	4.7%	13.0%	17.7%
UST INC	1.680	19.312	9.1%	9.0%	18.1%
USX-MARATHON GROUP	0.840	21.625	4.1%	13.0%	17.1%
USX-U S STEEL GROUP	1.000	21.875	4.8%	8.0%	12.8%

Discounted Cash Flow Analysis
Standard & Poor's 500 Companies

Source: S&P Compustat Data Base
Source Date: February 29, 2000

S&P Company Name	Current Dividend A	Current Price B	Expected Dividend Yield C= (calc)	Expected IBES LT Growth D	Market Required Return (Div Yld+Growth) E = C + D
VF CORP	0.880	24.688	3.7%	10.0%	13.7%
VULCAN MATERIALS CO	0.780	40.000	2.1%	12.0%	14.1%
WACHOVIA CORP	2.160	57.188	4.0%	11.0%	15.0%
WAL-MART STORES	0.200	48.875	0.4%	15.0%	15.4%
WALGREEN CO	0.135	25.812	0.6%	16.0%	16.6%
WARNER-LAMBERT CO	0.800	85.562	1.0%	18.0%	19.0%
WASHINGTON MUTUAL INC	1.040	22.125	5.0%	13.0%	18.0%
WASTE MANAGEMENT INC	0.040	15.000	0.3%	12.0%	12.3%
WELLS FARGO & CO	0.800	33.062	2.6%	13.0%	15.6%
WENDY'S INTERNATIONAL INC	0.240	15.750	1.6%	15.0%	16.6%
WESTVACO CORP	0.880	27.289	3.3%	7.0%	10.3%
WEYERHAEUSER CO	1.600	51.312	3.2%	8.0%	11.2%
WHIRLPOOL CORP	1.360	54.312	2.6%	10.0%	12.6%
WILLAMETTE INDUSTRIES	0.720	33.875	2.2%	10.0%	12.2%
WILLIAMS COS INC	0.600	41.812	1.5%	15.0%	16.5%
WINN-DIXIE STORES INC	1.020	16.125	6.6%	10.0%	16.6%
WORTHINGTON INDUSTRIES	0.600	13.250	4.9%	14.5%	19.4%
WRIGLEY (WM) JR CO	1.400	67.625	2.2%	11.0%	13.2%
XEROX CORP	0.800	21.750	3.9%	13.0%	16.9%
YOUNG & RUBICAM INC	0.100	50.500	0.2%	20.0%	20.2%
WEIGHTED AVERAGE REQUIRED RETURN			**1.7%**	**14.1%**	**15.8%**

Notes:
1. 102 companies were deleted from the sample. 96 do not pay dividends and 6 lack IBES long term growth rates.
2. Expected dividend yield is estimated using annual dividend increased by one half the IBES growth rate (dividend yield = annual dividend x (1 + .5 x growth rate) / price).
3. The S&P 500 is a market weighted index and the market required returns for individual companies are weighted by market value.

Standard & Poor's 500 Companies
Capital Asset Pricing Model Analysis
(Expected Return on the Market Model)

The Expected Return on the Market (Rm) is equal to the risk free rate of interest (Rf) plus Beta times the Market Risk Premium (MRP). $R_m = R_f + (\text{Beta} \times \text{MRP})$

			Refer to Note
Risk Free Rate			
Intermediate Term (3, 5, and 10 Yr Treasury Note Yields)		6.57%	(1)
Long Term (30 Year Treasury Bond Yields)		6.18%	(1)
Market Risk Premium			
Intermediate Term - Avg of Ex Post and Ex Ante		8.9%	
Ex Post (Ibbotson Data)	8.5%		(2)
Ex Ante (S&P 500 DCF - Risk Free Rate)	9.2%		(3)
Long Term - Avg of Ex Post and Ex Ante		8.9%	
Ex Post (Ibbotson Data)	8.1%		(2)
Ex Ante (S&P 500 DCF - Risk Free Rate)	9.6%		(4)
Beta			
By definition, the Beta of the market portfolio is	1.0		

CAPM Expected Return on the Market

Intermediate Term	6.57%	+	1.0	(8.9%)	=	15.5%
Long Term	6.18%	+	1.0	(8.9%)	=	15.1%
Average						15.3%

Notes:

1. Federal Reserve Statistical Release (H15 Reports) For the Period 2/15/00 thru 2/29/00
2. Market Results 1926-1999 from Ibbotson Associates (Stocks, Bonds, Bills & Inflation 2000 Yearbook)
3. 15.80% (Exhibit PCC-07) - 6.57% = 9.2%
4. 15.80% (Exhibit PCC-07) - 6.18% = 9.6%

Equity Risk Premium Test

		Notes				
Ex-Post Equity Risk Premium		(1)				
1. Common Stock Total Returns			13.3%			
2. Corporate Bonds Total Returns			5.9%			
3. Ex-Post Equity Risk Premium	(Line 1 - Line 2)		**7.4%**			
Ex-Ante Equity Risk Premium						
4. DCF Estimate for the S&P 500 Index		(2)	15.8%			
5. Cost of Single A LT Debt		(3)	8.3%			
6. Ex-Ante Equity Risk Premium	(Line 4 - Line 5)		**7.5%**			
Cost of Single A LT Debt		(3)	8.3%			
Adjustment to Equity Risk Premiums for Risk/Beta						
7. Beta Range from CAPM Estimate		(4)	0.78	to	0.80	
8. Ex-Post Equity Risk Premium	ERP	x	Beta	=	Adj-ERP	
9. (Risk-adjusted)	7.4%	x	0.78	=	5.8%	
10.	7.4%	x	0.80	=	5.9%	
11. Ex-Ante Equity Risk Premium	ERP	x	Beta	=	Adj-ERP	
12. (Risk-adjusted)	7.5%	x	0.78	=	5.9%	
13.	7.5%	x	0.80	=	6.0%	

Calculation of the Return Range for the Equity Risk Premium Test

	Equity Risk Premium Range	=	Cost of Single A LT Debt	+	Adjusted Risk Premium	=	
14.			8.3%	+	5.8%	=	**14.1%**
15.			8.3%	+	6.0%	=	**14.3%**

Notes:

1. Market Results 1926-1999 from Ibbotson Associates (Stocks, Bonds, Bills & Inflation 2000 Yearbook)
2. Ex-Ante DCF Estimate from Exhibit PCC-7
3. Average Seasoned Single A Public Utility Bond Yield from Moody's February 2000
4. Beta Range from CAPM (Exhibits PCC-5, PCC-6)

Telephone Cos Avg	=	0.80
Comparables Avg	=	0.78

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	**DOCKET NO. T-1051B-99-105**

STATE OF WASHINGTON)
: ss AFFIDAVIT OF PETER C. CUMMINGS
COUNTY OF KING)

Peter C. Cummings, of lawful age being first duly sworn, depose and states:

1. My name is Peter C. Cummings. I am Director – Finance & Economic Analysis of U S WEST Communications in Seattle, Washington.

2. Attached hereto and made a part hereof for all purposes is my testimony consisting of pages 1 through 6, and my exhibits numbered PCC-1 Through PCC-9.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Peter C. Cummings

SUBSCRIBED AND SWORN to before me this 27th day of April, 2000.

Lee Annette Fortier
Notary Public residing at
Seattle, Washington.

LEE ANNETTE FORTIER NOTARY PUBLIC COMMISSION EXPIRES 9/15/01 STATE OF WASHINGTON

My Commission Expires: 9/15/01

BEFORE THE ARIZONA CORPORATION COMMISSION

EXHIBIT
Q-18
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105

SUPPLEMENTAL DIRECT TESTIMONY

OF

ANN KOEHLER-CHRISTENSEN

U S WEST COMMUNICATIONS

May 3, 2000

TESTIMONY OF ANN KOEHLER-CHRISTENSEN
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II. EXHIBITS

Exhibit

Witness Qualification Statement AKC-1

1985 PHOENIX METRO DIRECTORY COVER AKC-2

1997 PRESCOTT DIRECTORY COVER AKC-3

1998 EAST VALLEY DIRECTORY COVER AKC-4

EXECUTIVE SUMMARY

1. Current Responsibilities:

My name is Ann Koehler-Christensen. I am employed by U S WEST Communications as a manager in the Regulatory Finance organization. My business address is 1600 7th Avenue, Room 3008, Seattle, Washington 98191.

I am responsible for the contractual relationships between U S WEST Communications and U S WEST Dex. This involves all issues including Yellow Pages imputation.

2. Purpose of Testimony:

The purpose of my testimony is to demonstrate the value of the services provided to U S WEST Communications by U S WEST Dex and the current amount of fees booked to Account 5230, Directory Revenue in this test period. DEX continues to provide directory services to U S WEST at no cost to U S WEST or to U S WEST customers. In fact, the value of the services DEX provided to U S WEST in this test period exceeded the value provided in the 1984 test year referenced in the Settlement Agreement. I will also explain the reason fees paid by DEX have been reduced. In large measure, the fees have been reduced because U S WEST provides commensurately less to DEX than it has in the past. I demonstrate that the current

booked fees and the value of services U S WEST receives from DEX are already reflected in the financial filings included in this rate case. Consequently, there is no need for any further adjustment to U S WEST's revenue requirement to reflect additional directory imputation.

3. Summary of Testimony:

DEX incurs all the costs of publishing and delivering directories to U S WEST customers. At the time of the Settlement Agreement DEX incurred these costs and DEX continues to incur these costs. The cost to DEX to publish and deliver directories has increased over the years from approximately $3.3 million to $13 million. However, the cost to U S WEST and to U S WEST customers was low in 1984 and is zero today.

The fees have decreased because the services provided under the Publishing Agreement are fewer and have less value today than previously. Both court decisions and federal legislation have contributed to the availability of listings and the ability of any publisher to publish directories in any market. This is a change in the publishing environment has drastically lowered the market value of publishing rights. U S WEST charges DEX market price for its listings and the Publishing Agreement between U S WEST and DEX reflects market conditions and values, since DEX has the same agreements with competitive Local Exchange Carriers as well as with independent Local Exchange Carriers.

U S WEST is receiving fees at a fair market rate for the full value of the services U S WEST provides to DEX. DEX continues to provide both White and Yellow Pages directories ("the services") at no cost to U S WEST or to U S WEST customers.

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Ann Koehler-Christensen. I am employed by U S WEST Communications as a manager in the Regulatory Finance organization. My business address is 1600 7th Avenue, Room 3008, Seattle, Washington 98191.

Q. WHY ARE YOU FILING SUPPLEMENTAL TESTIMONY?

A. I am filing supplemental testimony in order to update the test year information included in my January 8, 1999 testimony. Since this information is scattered throughout my testimony, I am replacing my original testimony entirely with this supplemental testimony.

Q. BRIEFLY OUTLINE YOUR EMPLOYMENT BACKGROUND.

A. My employment and educational background are shown on the Witness Qualification Statement, Exhibit AKC-1.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to demonstrate the value of the services provided to U S WEST Communications ("U S WEST") by U S WEST Dex ("DEX") and the current amount of fees booked to Account 5230, Directory Revenue in this test period. DEX continues to provide directory services to U S WEST at no cost to U S WEST or to U S WEST customers. In fact, the value of the services DEX provided to U S WEST in this test period exceeded the value provided in the 1984 test year referenced in the Settlement Agreement. I will also explain the reason fees paid by DEX have been reduced. In large measure, the fees have been reduced because U S WEST provides commensurately less to DEX than it has in the past. I demonstrate that the current booked fees and the value of services U S WEST receives from DEX are already reflected in the financial filings included in this rate case. Consequently, there is no need for any further adjustment to U S WEST's revenue requirement to reflect additional directory imputation.

SERVICES

Q. WHAT SERVICES DID DEX PROVIDE UNDER THE TERMS OF THE PUBLISHING AGREEMENT IN 1984?

A. Under the terms of the Publishing Agreement in effect in 1984, DEX was obligated to publish and deliver White Pages directories to U S WEST customers at no charge to U S WEST or it's customers.

Q. ARE THESE THE SAME SERVICES PROVIDED IN THE CURRENT PUBLISHING AGREEMENT?

A. Yes. However, the current agreement also obligates DEX to deliver Yellow Pages directories at no charge to U S WEST or it's customers and also to offer complimentary Yellow Pages listings to each of U S WEST's business customers.

Q. WHAT IS THE APPROXIMATE VALUE OF THE SERVICES PROVIDED BY DEX TO U S WEST?

A. The cost of publishing the White Pages and of delivering the White and Yellow Pages to U S WEST customers between in 1999 was approximately $12.8 million.

Q. WHO INCURRED THESE COSTS DURING THE TEST YEAR?

A. All the costs were incurred by DEX and were not passed on to U S WEST.

Q. HOW IS THE BENEFIT REFLECTED IN U S WEST'S FINANCIAL STATEMENTS?

A. If DEX had not published and distributed Arizona directories to U S WEST's customers under the terms of the Publishing Agreement, U S WEST would have had to incur these costs. U S WEST would have incurred an additional $12.8 million in order to meet this obligation. This means that not only would U S WEST's expenses have been $12.8 million higher, the revenue requirement would have been approximately $12.8 million higher as well.

Q. HOW DID YOU DETERMINE DEX'S COST OF PUBLISHING AND DELIVERING ARIZONA DIRECTORIES?

A. First, I obtained manufacturing (paper and printing) and distribution (delivery) expense for each Arizona directory from DEX for the 1999 test period.

Q. WERE DEX'S TOTAL MANUFACTURING AND DISTRIBUTION COSTS $12.8 MILLION FOR THE TEST PERIOD?

A. No, DEX's Arizona manufacturing and distribution costs for the test period were $40,267,486. To arrive at the $12.8 million, I went through several steps. First I excluded nine Arizona directories published by DEX that are not published on behalf of USWC and are not covered by the publishing agreement. Of DEX's remaining Arizona directories published in the test period, two were separately bound White Pages books and three were separately bound Yellow Pages books, and twelve were co-bound White and Yellow Pages directories. I obtained a count of the number of white pages and the number of yellow pages in each of these directories and I allocated the manufacturing expenses for each based on the proportion of white and yellow pages to arrive at White Pages manufacturing expense.

Q. DID YOU PERFORM ANY OTHER ALLOCATIONS?

A. Yes, because DEX directories include listings of customers of competitive and independent Local Exchange Carriers as well as of U S WEST customers, I

further allocated the manufacturing costs as well as the distribution costs. I obtained the number of U S WEST listings and the number of non-U S WEST listings included in each of DEX's Arizona directories. I allocated the White Pages manufacturing costs to U S WEST based on the percentage of U S WEST customers published in each directory. I allocated the distribution costs in the same way. After performing these two allocations, I arrived at $12.6 million for White Pages manufacturing and White and Yellow Pages distribution costs for U S WEST customers.

Q. WHAT OTHER COSTS DID YOU INCLUDE?

A. Manufacturing expense includes only printing and paper costs. DEX has a work group responsible for preparing the White Pages for printing. DEX's costs for this work group were **$970,000**. Arizona's portion of this is approximately **$200,000**.

Q. HOW DOES THE VALUE OF THE SERVICES PROVIDED BY DEX TO U S WEST IN THIS TEST YEAR COMPARE TO THE VALUE OF THE SERVICES PROVIDED IN 1984?

A. I estimate the 1984 value at approximately $2.4 million. The level of detail is no longer available to allow me to restate the 1984 expenses as I have done for the

test year. I've estimated the 1984 expenses by taking the same percentage of 1984 manufacturing and distribution expense as the $12.6 million is of the test year manufacturing and distribution expense. In 1984, as now, the cost to U S WEST was zero for manufacturing and distribution, although U S WEST did incur the costs to prepare camera-ready White Pages for printing. All the costs are now incurred by DEX and these costs have increased over fourfold. In this way, both U S WEST and U S WEST's customers receive the full value of high quality DEX directories without incurring any expense or risk. Under the terms of the Publishing Agreement, DEX continues to provide U S WEST customers with directories and DEX incurs all the risk of increased costs.

FEES

Q. **THE DIRECTORY SETTLEMENT AGREEMENT USED THE 1984 RATE CASE DIRECTORY AMOUNT AS ITS BASIS. PLEASE EXPLAIN THE SOURCES OF THE $43 MILLION IN THAT CASE.**

A. The $43 million in the 1984 test year consisted of $49.2 million of booked directory revenue [1] less $11.1 million of booked directory expense [2] plus a $4.9 million pro forma adjustment. The sum of these three equals $43 million.

[1] Booked to Account 523, Directory Revenue. The equivalent account is now Account 5230.

[2] Booked to Account 630, Directory Expense. There is no equivalent account today.

Q. PLEASE DESCRIBE THE VARIOUS SOURCES OF THESE REVENUES.

A. The $49.2 million of directory revenues on U S WEST's 1984 Arizona books included revenues from several sources. These were:

- $28.3 million of the revenues from Publishing Fees paid by DEX
- $16 million of Yellow Pages advertising revenues sold to advertisers in 1983, but paid to U S WEST in 1984
- $4.9 million in revenues that were received from U S WEST customers for non-standard listings as well as from U S WEST listings sold to other publishers.

The $11.1 million in directory expenses on the books related to the 1983 directories for which U S WEST booked $16 million in revenues. In other words, there was a net revenue impact of $5 million that occurred in the transition year of 1984 that did not continue past that year. Finally, there was a pro forma adjustment made to reflect the increase in the Publishing Fees for 1985 that had already been negotiated.

Q. HOW DO THESE AMOUNTS COMPARE TO REVENUES RECEIVED IN THE TEST YEAR USED IN THIS CASE?

A. The total Account 5230, Directory Revenue, included in this test year is $18,652,343. There are no Yellow Pages revenues or expenses on U S WEST's books. 1984 was the last year that Yellow Pages advertising and Yellow Pages expense appeared on U S WEST's books. After the 1984 transition year, all

1 Yellow Pages revenues and expenses, along with any risk, were incurred by
2 DEX rather than by U S WEST. Regulated revenues paid by DEX have gone
3 from $28.3 million in 1984 to $855,753 in the current test period. The revenues
4 on U S WEST's books from non-standard listings and from listings sold to other
5 directory publishers have grown from $4.9 million in 1984 to nearly $18 million in
6 the current test year.
7
8 **Q. WILL YOU PLEASE EXPLAIN THE REVENUES U S WEST RECEIVES FROM**
9 **NON-STANDARD LISTINGS AND FROM OTHER DIRECTORY PUBLISHERS?**
10
11 A. U S WEST sells non-standard White Pages listings to customers. These include
12 listings such as additional listings, e-mail address listings, and privacy listings.
13 U S WEST receives the revenue for these listings and DEX incurs the expense
14 of publishing the extra listings and any special handling required of privacy
15 listings, for example. U S WEST also makes its subscriber listings available to
16 all other publishers in addition to DEX. The revenues from the licensing of
17 U S WEST's subscriber listings are included in these directory revenues and the
18 benefit derived from this revenue is already reflected on U S WEST's books.
19
20 **Q. WHAT DID U S WEST PROVIDE TO DEX IN RETURN FOR THE $28.2**
21 **MILLION IN PUBLISHING FEES IN 1984?**
22

A. In 1984, the following services were provided by U S WEST to DEX under the Publishing Agreement:

- Negotiation of Yellow Pages heading information for DEX
- Access to U S WEST's Listings database
- Advanced List Service orders taken and provided to DEX to meet DEX directory closes
- Negotiation of directory delivery quantities
- Maintenance and provision of delivery routing information
- White Pages composition services and delivery of camera-ready White Pages to DEX
- Community Service Pages composition services and delivery of camera-ready pages to DEX
- Government Pages composition services and delivery of camera-ready pages to DEX
- Generic Phone Service Pages composition services and delivery of camera-ready pages to DEX
- Premium Phone Service Pages composition services and delivery of camera-ready pages to DEX
- Foreign Directory ordering services
- Use of Mountain Bell's name on Dex's directory covers (now U.S WEST)
- Placement of DEX directories in U S WEST's Public Pay Stations
- Subscriber Lists
- U S WEST granted DEX the right to publish directories for U S WEST

Q. DOES U S WEST CONTINUE TO PROVIDE ALL THESE SERVICES TO DEX?

A. No, U S WEST only provides the last three items on the preceding list for DEX.

- Placement of DEX directories in U S WEST's Public Pay Stations
- Subscriber Lists
- U S WEST granted DEX the right to publish directories for U S WEST

Q. PLEASE EXPLAIN THE CURRENT PUBLIC PAY STATIONS ARRANGEMENT.

A. Public Pay Stations were deregulated in 1997. As a result, all revenues and expenses associated with Public Pay Stations have been removed from regulated tariffs. This removal of Public Pay Station is not related to the directory publishing agreements between U S WEST and DEX, but is simply another change that was necessary as a result of legal, regulatory and competitive changes in this industry.

Q. WHAT IS THE VALUE OF THE SUBSCRIBER LISTS U S WEST PROVIDES TO DEX?

A. DEX pays U S WEST market value for the subscriber lists. The test year revenues from DEX for Arizona subscriber lists are **$855,750.**

Q. HOW HAS A MARKET VALUE BEEN ESTABLISHED?

A. U S WEST has the same listings agreements with DEX as it has with approximately fifty publishers throughout its fourteen-state territory. U S WEST licenses Arizona listings to four independent publishers as well as to DEX. U S WEST charges all publishers the same licensing fees and provides the lists on the same terms and conditions.

1 **Q. DOES DEX CONTINUE TO PAY U S WEST PUBLISHING FEES FOR THE**
2 **RIGHT TO PUBLISH DIRECTORIES FOR U S WEST?**
3
4 A. No, DEX compensates U S WEST by providing high quality White and Yellow
5 Pages directories to U S WEST customers at no cost. DEX does not pay any
6 additional fees to U S WEST for the right to publish directories that include
7 U S WEST subscriber listings.
8
9 **Q. PLEASE EXPLAIN WHY DEX NO LONGER PAYS U S WEST.**
10
11 A. U S WEST can not grant exclusive publishing rights to any publisher because all
12 publishers have the right to obtain and publish the listings of any local exchange
13 carrier ("LEC"). In 1984, U S WEST was under no obligation to make its
14 subscriber lists available to other publishers. In 1991, however, the Feist
15 Decision [3] established that neither White nor Yellow Pages listings, nor Yellow
16 Pages Headings could be copyrighted. This decision effected the publishing
17 business in two ways. First, it meant that any publisher could obtain listings in
18 order to publish directories, if not directly from the LEC, then by copying the
19 listings from directories published by another publisher. This also had the effect
20 of lowering the value of listings licensed from LECs. The Federal Telecom Act of
21 1996 now requires LECs to make their listings available to all publishers desiring

[3] Feist Publications, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340 (1991)

access to the listings. These decisions have led to lower prices associated with the sale or licensing of subscriber listings and the right to publish directories.

Q. IS THERE ANY EVIDENCE OF A MARKET PRICE FOR THE RIGHT TO PUBLISH DIRECTORIES?

A. Yes, the market price is zero. DEX currently has publishing agreements with thirteen competitive LECs and approximately one hundred independent LECs. Seven of these thirteen competitive LECs are certified to provide service in Arizona and eight of the independent LECs are Arizona LECs. These publishing agreements are virtually the same as the publishing agreement between DEX and U S WEST. In other words, DEX does not pay publishing fees.

Q. DO OTHER PUBLISHERS PAY U S WEST FOR THE RIGHT TO PUBLISH U S WEST'S SUBSCRIBER LISTINGS?

A. No, U S WEST licenses its subscriber listings to fifty independent publishers. These publishers pay U S WEST the same licensing fees as DEX pays U S WEST for the subscriber lists, but they do not pay U S WEST publishing fees. Four independent publishers license Arizona listings, although at least eight publishers include U S WEST subscriber listings in directories they publish

in Arizona. Basically, DEX does not pay publishing fees to publish their directories and other publishers do not pay publishing fees to U S WEST.

Q. DOES DEX PLACE U S WEST'S NAME ON THE FRONT OF ITS DIRECTORY COVERS?

A. Although DEX is under no obligation to place U S WEST's name on their directory covers, DEX has a relatively new policy to include on their covers the names of up to five LECs [4] with listings in the directory. U S WEST is one of the top five LECs for a majority of DEX directories.

Q. WHY DID DEX INSTITUTE THIS NEW POLICY?

A. Since mid-1988 DEX's policy has been to place only their own name on the covers of their directories. With the advent of local exchange competition, several competitive LECs attempted to have DEX include their names on the directory covers. When DEX declined, these LECs turned to regulators. The Montana Commission ordered DEX to place the names of local exchange carriers on the covers of their directories. To my knowledge, at least one other state commission had issued a similar order that was under appeal. About the same time, DEX was also negotiating publishing agreements with several

[4] DEX includes up to the top five local exchange carriers that have publishing agreements with DEX. The top five are selected by directory on the basis of the percentage of primary listings appearing in the directory.

different competitive LECs. DEX revised their policy and committed to printing the names of up to five LECs on their directory covers.

Q. IS THERE VALUE TO DEX TO PLACE THE NAMES OF SEVERAL LOCAL EXCHANGE CARRIERS ON THEIR COVERS?

A. I suppose a case could be made that there is some value to DEX, but I believe a stronger case can be made that the value is greater for the LECs, including U S WEST, than it is to DEX.

Q. IF DEX ONLY RECENTLY STARTED INCLUDING LEC NAMES ON THEIR COVERS, WHAT DID DEX DO PREVIOUSLY?

A. From 1984 through mid-1988, DEX published their Arizona directories with Mountain Bell's name on the cover. U S WEST DIRECT (now DEX) was created in 1984 and their name was new and an unknown. The three telephone companies, Mountain Bell, Northwestern Bell and Pacific Northwest Bell, had name recognition. Although at divestiture these three companies combined to make up the new U S WEST RBOC, they retained their individual names and continued to do business with their established names and reputations. In this way, DEX was able to capitalize on both the name recognition and the business relationship that Mountain Bell had had with its Yellow Pages advertisers.

Exhibit AKC-2 is a copy of a 1985 Phoenix Metro directory cover to illustrate the cover appearance between 1984 and mid-1988.

In mid-1988 DEX made the decision to publish its directories without Mountain Bell's name on the cover. By 1988, however, the U S WEST DIRECT name was well known and the publisher had established its own relationship with advertisers. Mountain Bell was still doing business as Mountain Bell, not U S WEST, however the directories were published with only the U S WEST DIRECT name on the cover. The Bell logo still appeared on the covers, but it should be understood that the Bell logo was owned by the parent company, U S WEST, Inc., not by Mountain Bell, nor the other two telephone companies. This style directory cover was used by DEX from mid-1988 into early 1997. Exhibit AKC-3 is a copy of a 1997 Prescott directory cover in this style.

In the fall of 1996, U S WEST DIRECT became U S WEST DEX. The name U S WEST DEX and it's new logo, the "your directory expert" detective with the magnifying glass were first used on the directory covers starting in 1997. At that time the Bell logo was dropped. In 1998 DEX began including LEC names on the cover in many locations, as I previously described. Exhibit AKC-4 is a copy of a current East Valley directory cover.

Q. SHOULD DEX COMPENSATE U S WEST FOR ITS U S WEST NAME ASSOCIATION?

A. No, DEX has established its own name recognition and no longer relies on its former or current relationship with U S WEST. This becomes apparent by viewing the changes in the cover formats from 1984 -1988 (AKC-2) to 1988 - 1997 (AKC-3) to 1998, the current cover format (AKC-4).

Q. WHAT ABOUT THE FACT THAT DEX HAS U S WEST IN ITS NAME?

A. DEX has as much right and ownership to the U S WEST part of their name as U S WEST Communications does. Over the last fifteen year, in fact, DEX has contributed greatly to the name recognition of U S WEST. There is no need for DEX to compensate U S WEST for a name that belongs to both companies as well as to other U S WEST companies.

Q. PLEASE SUMMARIZE WHY THE FEES PAID BY DEX ARE LOWER NOW THAN THEY WERE IN 1984.

A. Fees paid by DEX are lower now than they were in 1984 for two reasons. First, DEX receives fewer services from U S WEST under the current publishing agreement than in 1984, so the fees have been reduced. Second, changes in

1 market and legal conditions have reduced the value of services provided by
2 U S WEST under the Publishing Agreement.
3
4 **Q. DOES U S WEST RECEIVE FULL VALUE IN FEES FOR THE SERVICES**
5 **PROVIDED UNDER PUBLISHING AGREEMENTS TODAY?**
6
7 A. Yes. DEX provides the same quality White and Yellow Pages directories to
8 U S WEST's customers at no cost to U S WEST or its customers under the
9 terms of a publishing agreement that is virtually the same as DEX has with many
10 competitive and independent LECs. DEX pays U S WEST market rates for
11 subscriber listings, as do many independent directory publishers. Mr. Redding
12 has reflected all the fees and the benefit of the cost savings in the financials filed
13 in this case.
14
15 **CONCLUSION**
16
17 **Q. WHO INCURS THE COSTS OF PUBLISHING AND DELIVERING**
18 **DIRECTORIES TO U S WEST CUSTOMERS?**
19
20 A. DEX incurs all the costs of publishing and delivering directories to U S WEST
21 customers. At the time of the Settlement Agreement DEX incurred these costs
22 and DEX continues to incur these costs. The cost to DEX to publish and deliver

directories has increased over the years from approximately $2.5 million to $13 million. However, the cost to U S WEST and to U S WEST customers was low in 1984 and is zero today.

Q. WHY HAVE THE FEES PAID BY DEX TO U S WEST DECREASED?

A. The fees have decreased because the services provided under the Publishing Agreement are fewer and have less value today than previously. Both court decisions and federal legislation have contributed to the availability of listings and the ability of any publisher to publish directories in any market. This change in the publishing environment has drastically lowered the market value of publishing rights. U S WEST charges DEX market price for its listings and the Publishing Agreement between U S WEST and DEX reflects market conditions and values, since DEX has the same agreements with competitive Local Exchange Carriers as well as with independent Local Exchange Carriers.

Q. IS ANY IMPUTATION APPROPRIATE?

A. No. U S WEST is receiving fees at a fair market rate for the full value of the services U S WEST provides to DEX. DEX continues to provide both White and Yellow Pages directories ("the services") at no cost to U S WEST or to U S WEST customers.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105

EXHIBITS

OF

ANN KOEHLER-CHRISTENSEN

U S WEST COMMUNICATIONS

May 3, 2000

WITNESS QUALIFICATION STATEMENT

NAME: Ann Koehler-Christensen

EMPLOYED BY: U S WEST Communications, Inc.

ADDRESS: 1600 7th Avenue, Room 3008, Seattle, Washington 98191

EDUCATION: Bachelor of Arts degree in German, University of Puget Sound, 1969

Master of Arts degree in Economics, New Mexico State University, 1994

WORK EXPERIENCE:

1970-1972	Service Representative, Business Office
1972-1988	Various Management positions in Accounting
1988-1996	Manager-Affiliated Interests, Public Policy
1996-Current	Manager-Regulatory Finance, Finance

PRINCIPLE DUTIES: Responsible for the analysis of information and contractual agreements concerning U S WEST's affiliated relationship with U S WEST Dex, Inc., including the imputation of revenues by regulatory commissions.

WITNESS EXPERIENCE: Issue: Directory

Arizona
Docket E-1051-93-183, Rebuttal Testimony filed 4/22/94
Docket T-1051B-99-105, Direct Testimony filed 1/8/99

Idaho
Docket USW-S-96-5, Rebuttal Testimony filed 1/23/97

Iowa
Docket No. RPU-93-9, Direct Testimony filed 12/6/93
Docket No. RPU-93-9, Surrebuttal Testimony filed 2/23/94

Montana
Docket No. 90.12.86, Direct Testimony filed 1/15/92

New Mexico
Docket No. 92-227-TC, Rebuttal Testimony filed 1/26/93

Oregon
Docket UT 125, Direct Testimony filed 12/18/95
Docket UT 125, Reply Testimony filed 10/7/96

Utah

Docket 94-049-08, Direct Testimony filed 3/10/95
Docket 94-049-08, Rebuttal Testimony filed 8/25/95
Docket 97-049-08, Direct Testimony filed 3/18/97
Docket 97-049-08, Rebuttal Testimony filed 8/22/97
Docket 97-049-08, Surrebuttal Testimony filed 9/3/97

Washington

Docket UT-950200, Rebuttal Testimony filed 10/3/95
Docket UT-980948, Direct Testimony filed 10/16/98
Docket UT-980948, Rebuttal Testimony filed 4/23/99
Docket UT-980948, Rejoinder Testimony filed 7/16/99

Metro
Phoenix
Area Code 602

Mountain Bell

September 1985

The White Pages

Published by
U S WEST DIRECT®

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Prescott
gdad • Chino Valley
ewey • Humboldt • Mayer
Prescott Valley

Area Code 520
April 1997/1998

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September 1998/1999

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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-1051B-99-105 AFFIDAVIT OF ANN KOEHLER-CHRISTENSEN
STATE OF WASHINGTON	)	
COUNTY OF KING	)	
	) :)	SS

Ann Koehler-Christensen, of lawful age being first duly sworn, deposes and states:

1. My name is Ann Koehler-Christensen. I am a Regulatory Manager in the Finance Department of U S WEST Communications in Seattle, Washington.

2. Attached hereto and made a part hereof for all purposes is my testimony.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct tot the best of my knowledge and belief.

Ann Koehler-Christensen

SUBSCRIBED AND SWORN to before me this 1st day of May, 2000.

FAYE G. VALLEY
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
11-24-03

Faye G. Valley
Notary Public
Residing at Kent

My Commission Expires:
11/24/03

BEFORE THE ARIZONA CORPORATION COMMISSION

EXHIBIT
Q-19
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105

SUPPLEMENTAL DIRECT TESTIMONY

OF

GEORGE REDDING

U S WEST COMMUNICATIONS

May 3, 2000

TESTIMONY OF GEORGE REDDING
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IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME , TITLE, EMPLOYER AND ADDRESS.

A. My name is George Redding. I am employed by U S WEST Communications ("U S WEST" or "Company") as Director-Regulatory Finance. My address is 1801 California, Denver, Colorado.

Q. ARE YOU THE SAME GEORGE REDDING WHO FILED DIRECT TESTIMONY IN THIS PROCEEDING ON JANUARY 8, 1999?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR THIRD SUPPLEMENTAL TESTIMONY?

A. In a hearing on April 4, 2000, the Chief Hearing Officer ordered U S WEST to update its filing to reflect a 1999 test year. This supplemental testimony outlines this update to the test year and discusses several differences between this test year and the original test year, which was the twelve months ending June 30, 1998.

Q. DOES THIS FILING COMPLETELY REPLACE YOUR ORIGINAL FILING DATED JANUARY 8, 1999 AND YOUR FIRST AND SECOND SUPPLEMENTS DATED MARCH AND DECEMBER OF 1999?

A. Not completely. As I stated in my December 1999 supplemental filing, the March 1999 supplemental filing was completely replaced by the December 1999 supplemental filing. That still holds true.

The original January 1999 filing and the December 1999 supplemental filing are still valid as far as discussion of issues is concerned. However, all amounts in those filings and the accompanying exhibits to those filings are completely replaced by this supplemental filing updating the test year.

Q. ARE YOU UPDATING THE R-14 FILING PACKAGE?

A. No, I am not. Due to the extreme time constraint imposed by the requirement to file the update to the test year by May 2, 2000, I have not attempted to update the filing package.

Q. ARE YOU UPDATING THE RCND FILING OR THE RATE OF RETURN ADVOCACY?

A. Both will be updated. Mr. Peter Cummings has provided me with an updated cost of capital and is filing supplemental testimony concurrent with my filing. Ms. Nancy Heller-Hughes will be filing updated RCND testimony and exhibits reflective of the update to the test year and the new depreciation rates and lives approved April 25, 2000. However, this update will require approximately six weeks. It will be filed as soon as possible.

Q. YOU MENTIONED NEW DEPRECIATION RATES AND LIVES. ARE THEY REFLECTED IN YOUR UPDATE?

A. Yes, they are. Mr. Dennis Wu, U S WEST's witness in the depreciation docket, will address the depreciation rates and lives granted in that docket and the impact of those rates and lives when applied to December 31, 1999 plant balances. This amounted to $99.7M. To this was added approximately $4.1M related to the change in rates and lives applied to deregulated investment and another $4.0M related to the change in rates and lives applied to the difference between state and FCC capitalized interest.

Q. WHAT IS THE REVISED ADDITIONAL REVENUE REQUIREMENT?

A. It is $201.2M based on calendar year 1999.

Q. HOW IS YOUR SUPPLEMENTAL TESTIMONY ORGANIZED?

A. First I will outline the revised exhibits that accompany this supplemental testimony. Then, I will describe the process necessary to perform the end of period adjustment to the revised test year. Following that, I will describe the other pro forma adjustments made to the test year. Finally, I will describe any differences in adjustments made to the revised 1999 test year as compared to the test year ended June 30, 1998.

ORGANIZATION OF EXHIBITS

Q. PLEASE OUTLINE THE ORGANIZATION OF YOUR EXHIBITS.

A. They will be organized as follows:

GAR-S1	Revenue Requirement Summary
GAR-S2	Capital Structure
GAR-S3	Income to Revenue Multiplier
GAR-S4 group	Rate Base & Associated Adjustments
GAR-S5	Income Statement Summary
GAR-S6 group	Commission Adjustments & Explanations
GAR-S7 group	Pro Forma Adjustments & Explanations
GAR-S8	Three Year Adjustment & Explanation
GAR-S9	Automatic Adjustment Mechanism Adjustment & Explanation

This follows the same general organization as used in my January 8, 1999 original exhibit.

END OF PERIOD ADJUSTMENT

Q. PLEASE DESCRIBE THE END OF PERIOD ADJUSTMENT AND THE STEPS NECESSARY TO PERFORM SUCH AN ADJUSTMENT.

A. Certainly. Because of the requirement of a fair value rate base, any revenue requirement filing in Arizona is based on an end of period rate base. In order to maintain a synchronization between the revenues, expenses, taxes and rate base, it is necessary to bring the revenue, expenses and taxes to end of period levels to match the rate base. It is what is commonly known as a volume adjustment.

The end of period adjustment eliminates accounting adjustments per se and all in-period pro forma annualization adjustments. Accounting adjustments are still made, but they are included in the development of the base for the end of period adjustment as I will describe more fully. In-period pro forma annualizations also become part of the end of period adjustment. For example, if a revenue change took place in October, a normal pro forma adjustment would annualize the price level change such that it would look like it had been in effect for the entire test year. With an end of period adjustment this annualization is not necessary as the new level of revenues is already included in the end of period amount used as the basis for the end of period adjustment.

Q. DID YOU INCLUDE AN END OF PERIOD ADJUSTMENT IN YOUR ORIGINAL FILING ON JANUARY 8, 1999?

A. Yes, I did. With some exceptions, that end of period adjustment was done in the same manner as in the Company's last rate case, Docket No. E-1051-93-183. The only major difference between the end of period adjustment I presented on the original test year ended June 30, 1998 and that used in Docket No. E-1051-93-183 is that I annualized the end of the test year for non-wage related expenses as well as for revenues, wage related expenses and taxes which had been done in the prior docket.

Q. HAVE YOU PERFORMED THE SAME ADJUSTMENT TO THE REVISED TEST YEAR?

A. Yes, I have.

Q. PLEASE DESCRIBE THE PROCESS REQUIRED TO PERFORM AN END OF PERIOD ADJUSTMENT.

A. Following the precedent of Docket No. E-1051-93-183, I annualized revenues, wage related and non-wage related expenses and taxes by multiplying the last month of the test year by twelve. For the updated test year, that month is

December 1999. In order for this adjustment to be done properly, two steps need to be taken before annualizing the December 1999 results.

The first step was to analyze December and remove any one time or unusual adjustments that were made in that month. This is very similar to the normal process of accounting adjustments. The difference is that these accounting adjustments are not made as discrete adjustments. Rather, they are used to adjust the starting point that will then be annualized to bring the test year to end of period volumes. For this reason, they are not shown as separate adjustments.

Once December is normalized, it must then be compared to a trend of operational results. This is done to ensure that the month being annualized is representative of the trends in operational results, both revenues and expenses. In the case of the updated test year, a few items were not in alignment with trend. When this occurs, additional analysis must be undertaken and alternatives to the annualization of December must be used.

Q. CAN YOU GIVE AN EXAMPLE WHERE YOU USED ALTERNATIVE METHODS?

A. In the case of wage related expenses, the normalized month of December was not in alignment with a trend based on the months of October 1999 through

February 2000. One of the items that was out of trend was customer operations wages and salaries. I substituted an amount developed from examining the trend for the normalized December in this case. After making this adjustment, the total of wage related expense to be annualized was in line with trend. The modified December amount was then annualized to obtain the end of period adjustment.

Q. DID YOU DO THIS WITH ALL LINE ITEMS?

A. An overall reasonableness check as described above was performed for all line items. In many cases, the normalized December amounts were in line with trend and no further analysis was necessary. It was only when the normalized December was not in line with trend that further analysis was done.

Q. IN THE LAST CASE YOU SET FORTH A NUMBER OF "ADJUSTMENTS NOT MADE" IN CASE SOME PARTIES CHOSE TO CONTEST THE END OF PERIOD ADJUSTMENT. HAVE YOU DONE THE SAME IN THIS UPDATE?

A. No, I have not. Time constraints precluded me from making these adjustments. I had only enough time to make the necessary adjustments to present a revenue requirement update using the end of period methodology described above.

COMMISSION & PRO FORMA ADJUSTMENTS

Q. WHAT COMMISSION ADJUSTMENTS HAVE YOU MADE?

A. They are identical in type to those made in the original filing. Non-employee concessions were removed, cash working capital and customer deposits adjustments were made to the rate base. Some amounts of merger costs related to the merger of the three telephone companies are still being amortized and were removed. An interest synchronization adjustment was made. All of these adjustments were in accordance with the Commission's order in Docket No. E-1051-93-183. One Commission adjustment was not made, namely that for Bellcore expenses. This adjustment was not necessary since Bellcore had been sold to an independent third party prior to the beginning of the test year.

Q. WHAT PRO FORMA ADJUSTMENTS, OTHER THAN THE END OF PERIOD ADJUSTMENT, HAVE YOU MADE IN THE UPDATE?

A. As mentioned earlier, I have made an adjustment for the new depreciation rates just ordered. I also made adjustments for wage and salary increases that will occur within twelve months of the end of the test year, an adjustment to include Post-Retirement Benefits Other than Pensions (PBOPs) and the inclusion of the pension asset. I also made a three year adjustment for the Bellcore gain. These same adjustments were made for the original test year.

Q. ARE THERE ANY OF THESE ADJUSTMENTS YOU WISH TO DISCUSS FURTHER?

A. Yes. My discussion of the PBOP issue on page 19 of my January 1999 testimony should be reviewed for the rationale for this adjustment. Likewise the discussion beginning at page 15 of my January 1999 testimony addresses the pension asset in some detail.

Q. IN YOUR ORIGINAL TESTIMONY YOU DISCUSSED CERTAIN ADJUSTMENTS YOU DID NOT MAKE, NAMELY DIRECTORY AND AFFILIATED INTERESTS. DID YOU MAKE ANY ADJUSTMENTS FOR THESE ISSUES IN THIS UPDATE?

A. No, I did not. I discussed affiliated interests at some length beginning at page 21 of my January 1999 testimony. Nothing that I discussed there has changed. Ms. Ann Koehler-Christensen discusses the directory issue in depth in her testimony. Because the modifications necessitated by a change in test year appear throughout her testimony, her supplemental direct testimony completely replaces her direct testimony filed on January 8, 1999.

DIFFERENCES IN ADJUSTMENTS CAUSED BY UPDATE

Q. WHAT ADJSUTMENTS ARE DIFFERENT FROM THOSE MADE TO THE ORIGINAL TEST YEAR?

A. One that requires some explanation is the three year adjustment made in my original test year for Y2K expenses. I did not make a similar adjustment in this update. When I was developing the original revenue requirement based on the test year ending June 30, 1998, it appeared that Y2K expenses would create an out-of-trend condition for Information Technology expenses. With the benefit of hindsight, this is not the case. Information Technology expenses have and are continuing to grow. The necessity to address the Y2K problem caused other projects to be deferred. Those projects are now being addressed.

Q. WHAT EVIDENCE TO YOU HAVE THAT INFORMATION TECHNOLOGY EXPENSES ARE NOT OUT OF TREND?

A. The Arizona information technology expenses for the last several years have been as follows:

1996	$ 76.3M
1997	101.5M
1998	122.8M
1999	129.0M
2000*	159.8M

*Annualized based on January through March actual results.

Furthermore, the Information Technology budget for the Company for 1999 was $1,192M; it is $1,375M for 2000. Based on this evidence I have treated all information technology expenses as a normal ongoing item; in other words, the projects may change, but the total level of expense is trending upward.

Q. ARE THERE OTHER ADJUSTMENTS THAT ARE NOT INCLUDED IN THE UPDATE THAT WERE IN THE ORIGINAL FILING?

A. There are two additional items, namely amortization of the depreciation reserve deficiency and Local Number Portability (LNP). In a recent decision, the Commission rejected the reserve deficiency amortization; therefore, it is not included in this filing.

An adjustment for LNP is no longer necessary. At the time of the original filing, LNP revenues were credited entirely to the interstate jurisdiction while expenses and investment associated with LNP were split between the interstate and intrastate jurisdiction. This burdened the intrastate jurisdiction with part of the cost of LNP, but none of the revenues. Therefore, an adjustment was included in the December 1999 supplement that allocated part of the revenue to the intrastate jurisdiction.

Such an adjustment is no longer necessary. Beginning in late 1999, the revenues, expenses and investment associated with the provision of LNP were removed entirely from the separation process. This means that none of the costs or revenues associated with LNP are included in the intrastate jurisdiction. Therefore no specific adjustment is needed; the amounts are already excluded from the base.

Q. ARE THERE ANY ADJUSTMENTS THAT ARE DIFFERENT FROM THE ORIGINAL FILING?

A. Yes, the adjustment related to the removal of cable services. In the initial filing the revenues, expenses and investment related to this product were inadvertently included in the Company's January 1999 filing. These items, which were never included in the determination of regulated rates, were removed in the December 1999 update, my second supplemental filing.

During 1999, several things have changed with relation to cable services. First, a separate subsidiary, Broadband Services, Inc. (BSI) was incorporated in 1999 to take over this line of business. All new investment related solely to the provision of cable services has been paid for by and recorded on the books of BSI. U S WEST currently has an open docket, Docket No. T-01051B-99-0499, in which it is requesting the transfer of the assets related solely to the provision of cable

services from U S WEST Communications to BSI. The adjustment I have made in this update excludes these assets that are pending transfer from the rate base. All revenues and expenses related to the provision of cable services have been excluded from the base prior to the end of period adjustment.

Q. DO YOU HAVE ANY NEW ADJUSTMENTS?

A. I have two. The first relates to the removal of revenues, expenses and investment related to the exchanges in Arizona that the Company is requesting permission to sell in Docket No. T-01051B-99-0737. This adjustment was required in the procedural order relating to the update.

The second adjustment relates to a new issue, namely that of reciprocal compensation. What the Company is requesting here is an automatic rider that adjusts up and down based on the net payments of reciprocal compensation. What I have included in my adjustment is the annualized value of the first three months of 2000 net expense. No reciprocal compensation is included in the base test year or the end of period adjustment.

Q. HOW WOULD SUCH AN AUTOMATIC RIDER WORK?

A. It could work several ways. The one U S WEST is suggesting would base each six months or quarter rider on the actual level of payments in the prior six months or quarter. The actuals for each base period would be reported to the Commission and subject to audit at any time.

Q. WHY IS THE COMPANY SUGGESTING A MECHANISM SUCH AS THIS?

A. Right now net reciprocal compensation is growing very rapidly. In the future, as agreements are modified or renegotiated, this level may drop. In other words, the situation is very volatile. An automatic mechanism would ensure that the Company received no more in rates than it is entitled to, whereas inclusion in the base revenue requirement would ensure that the Company would either over or under collect in the future.

Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL TESTIMONY?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105

EXHIBITS

OF

GEORGE REDDING

U S WEST COMMUNICATIONS

May 3, 2000

SUPPLEMENTAL EXHIBITS OF
GEORGE REDDING

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U S WEST
Arizona Intrastate Operations
Revenue Requirement Summary
Test Year Ending December 31, 1999
$(000)

		Original Cost	Fair Value
1.	Adjusted Rate Base	$ 1,422,099	
2.	Adjusted Net Operating Income	43,822	
3.	Current Rate of Return (L2/L1)	3.08%	
4.	Required Operating Income (L1*L5)	154,430	
5.	Required Rate of Return	10.86%	
6.	Operating Income Deficiency	110,608	
7.	Gross Revenue Conversion Factor	1.7056	
8.	Increase in Revenue Requirements (L6*L7)	$ 188,654	
9.	BellCore 3 Year Adjustment Revenue Requirement	(686)	
10.	Automatic Adj Mechanism Revenue Requirement	13,252	
11.	Increase in Gross Revenue Requirements (L8 + L9 + L10)	$ 201,220	

U S WEST
Arizona Intrastate Operations
Capital Structure
Test Year Ending December 31, 1999
$(000)

	Percent of Total Capital	Cost Rate	Weighted Cost
Total Debt	47.60%	7.39%	3.52%
Common Equity	52.40%	14.00%	7.34%
Total Capital	100.00%		10.86%

U S WEST
Arizona Intrastate Operations
Income to Revenue Multiplier
Test Year Ending December 31, 1999
$(000)

1	Gross Intrastate Revenue	100.00%
2	Less: Uncollectible Revenue (Note a)	1.851%
3	Total Revenue (L1-L2)	98.1491%
4	Less: Taxes on Local Revenue Service (Note b)	0.1066%
5	Taxable Income (L3-L4)	98.0425%
6	Less: Effective State Income Tax (L5 * 8.00%)	7.8434%
7	Less: Effective Federal Income Tax (L5 * 32.00%)	31.5697%
8	Net Operating Earnings (L5-L6-L7)	58.6294%
9	Income to Revenue Multiplier (L1 / L8)	1.7056

Notes:
a. Based on Test Year End of Period Adjustment.
b. Includes Franchise and License taxes and Sales tax assumed.

U S WEST
Arizona Intrastate Operations
Original Cost Rate Base Summary
Test Year Ending December 31, 1999
($000)

Original Cost	[a] Intrastate EOP Rate Base	[b] Commission Adjustments	[c] Proforma Adjustments	[d]=a+b+c Original Cost Rate Base	[e] Gain On BellCore Sale	[f] Automatic Adjustment Clause
1 Telephone Plant In Service	$ 3,699,107	$ -	$ (133,092)	$ 3,566,015	$ -	$ -
2 Short-Term Plant Under Construction	0	0	0	0	0	0
3 Materials and Supplies	18,386	0	0	18,386	0	0
4 Allowance for Cash Working Capital	(24,398)	(14,813)	0	(39,211)	0	0
5 Accumulated Depr & Amort Reserve	(1,818,488)	0	(104,538)	(1,923,025)	0	0
6 Accumulated Deferred Income Tax	(309,060)	0	68,525	(240,535)	0	0
7 Customer Deposits	(5,696)	(2,015)	0	(7,711)	0	0
8 Land Development Agreement Deposits	(18,040)	0	0	(18,040)	0	0
9 Other Assets & Liabilities	0	0	66,221	66,221	0	0
10 **End-of-Period Rate Base(L1.L9)**	$ 1,541,811	$ (16,828)	$ (102,883)	$ 1,422,100	$ -	$ -

NOTE: Fair Value is 50% Original Cost and 50% RCND

U S WEST
Arizona Intrastate Operations
Original Cost Rate Base Summary
Test Year Ending December 31, 1999
($000)

Original Cost	[a] Intrastate EOP Rate Base	[b] Commission Adjustments	[c] Proforma Adjustments	[d]=a+b+c Original Cost Rate Base	[e] Gain On BellCore Sale	[f] Automatic Adjustment Clause
1 Telephone Plant In Service	$ 3,699,107	$ -	$ (133,092)	$ 3,566,015	$ -	$ -
2 Short-Term Plant Under Construction	0	0	0	0	0	0
3 Materials and Supplies	18,386	0	0	18,386	0	0
4 Allowance for Cash Working Capital	(24,398)	(14,813)	0	(39,211)	0	0
5 Accumulated Depr & Amort Reserve	(1,818,488)	0	(104,538)	(1,923,025)	0	0
6 Accumulated Deferred Income Tax	(309,060)	0	68,525	(240,535)	0	0
7 Customer Deposits	(5,696)	(2,015)	0	(7,711)	0	0
8 Land Development Agreement Deposits	(18,040)	0	0	(18,040)	0	0
9 Other Assets & Liabilities	0	(686)	66,221	65,535	0	0
10 **End-of-Period Rate Base(L1.L9)**	$ 1,541,811	$ 13,252	$ (102,883)	$ 1,421,414	$ -	$ -

NOTE: Fair Value is 50% Original Cost and 50% RCND

U S WEST
Arizona Intrastate Operations
End of Period Rate Base - Summary of Rate Base Commission Adjustments
Test Year Ending December 31,1999
$(000)

		[a]	[b]	[c]=a+b
		Customer Deposits Adjustment	Cash Working Capital	Summary Commission Adjustments to Rate Base
1	Telephone Plant In Service	$ -	$ -	$ -
2	Short-Term Plant Under Construction	0	0	0
3	Materials and Supplies	0	0	0
4	Allowance for Cash Working Capital	0	(14,813)	(14,813)
5	Accumulated Depr & Amort Reserve	0	0	0
6	Accumulated Deferred Income Tax	0	0	0
7	Customer Deposits	(2,015)	0	(2,015)
8	Land Development Agreement Deposits	0	0	0
9	Other Assets & Liabilities	0	0	0
10	**End-of-Period Rate Base(L1.L9)**	$ (2,015)	$ (14,813)	$ (16,828)

U S WEST
Arizona Intrastate Operations
End of Period Rate Base - Summary of Proforma Adjustments included
Test Year Ending December 31, 1999
$(000)

		[a]	[b]	[c]	[d]	[e]	[f]=sum(a.e)
		Depreciation	Pension Asset	OPEB Adjustment	Removal of Cable Franchise	Access Line Sale	Summary Proforma Adjustment Included
1	Telephone Plant In Service	$ -	$ -	$ 1,478	$ (10,191)	$ (124,379)	$ (133,092)
2	Short-Term Plant Under Construction	0	0	0	0	0	0
3	Materials and Supplies	0	0	0	0	0	0
4	Allowance for Cash Working Capital	0	0	0	0	0	0
5	Accumulated Depr & Amort Reserve	(107,968)	0	31	3,400	0	(104,538)
6	Accumulated Deferred Income Tax	43,403	0	4,077	0	21,045	68,525
7	Customer Deposits	0	0	0	0	0	0
8	Land Development Agreement Deposits	0	0	0	0	0	0
9	Other Assets & Liabilities	0	66,221	0	0	0	66,221
	End-of-Period Rate Base(L1.L9)	$ (64,565)	$ 66,221	$ 5,585	$ (6,792)	$ (103,334)	$ (102,883)

U S WEST
Arizona Intrastate Operations
Income Statement Summary
Test Year Ending December 31, 1999
$(000)

		[a] Year Ending December 31, 1999 Intrastate	[b] Commission Adjustments	[c] Proforma Adjustments	[d]=a+b+c Adjusted Test Year	[e] BellCore 3 Year Adjustment	[f] Automatic Adjustment Clause
Revenues							
1	Local Service Revenues	$ 954,934	$ 2,249	$ (36,421)	$ 920,762	$ -	$ 7,932
2	Network Access Service Revenues	121,079	0	(5,827)	115,252	0	0
3	Long Distance Network Service Rev.	30,318	0	(7,905)	22,413	0	0
4	Miscellaneous	142,436	0	(10,594)	131,842	0	0
5	Total Oper. Rev. (L1 thru L4)	1,248,767	2,249	(60,747)	1,190,269	0	7,932
Expenses							
6	Maintenance	266,063	0	16,259	282,322	0	0
7	Engineering Expense	10,710	0	790	11,500	0	0
8	Network Operations	41,575	0	10,624	52,199	0	0
9	Network Administration	2,052	0	285	2,337	0	0
10	Access Expense	20,801	0	(17,752)	3,049	0	20,522
11	Other	472	0	829	1,301	0	0
12	Total Cost of Svcs & Products(L6 thru L11)	341,672	0	(14,474)	327,198	0	20,522
13	Customer Operations	190,243	0	29,048	219,291	0	0
14	Corporate Operations	186,490	0	20,485	206,976	0	0
15	Property & Other Taxes	51,586	3	(3,571)	48,017	0	23
16	Uncollectibles	18,644	42	(2,586)	16,101	0	380
17	Tot Selling, Gen. & Admin.(L13 thru L16)	446,964	45	43,377	490,385	0	403
18	Other Operating Income & Expense	18	463	366	847	(673)	0
19	Depreciation Expense	239,714	(13)	89,183	328,884	0	0
20	Universal Service Fund	(1,370)	0	1,370	0	0	0
21	Link Up America	(88)	0	(29)	(117)	0	0
22	Total Operating Expense(L12+L17 thru L21)	1,026,910	495	119,793	1,147,198	(673)	20,924
23	Income From Operations (L5-L22)	221,857	1,754	(180,539)	43,071	673	(12,993)
Taxes							
24	Federal Income Tax	55,903	(922)	(58,092)	(3,111)	217	(4,184)
25	State & Local Income Tax	17,011	(229)	(14,432)	2,350	54	(1,039)
26	**Net Operating Income (L23-L24-L25)**	$ 148,942	$ 2,905	$ (108,015)	$ 43,832	$ 402	$ (7,770)
Other							
27	Nonoperating Income & Expense	19,958	0	0	19,958	0	0
28	Nonoperating Income Tax	230	0	0	230	0	0
29	Net Operating Earnings (L26-L27-L28)	$ 128,754	$ 2,905	$ (108,015)	$ 23,644	$ 402	$ (7,770)
30	Interest Expense	45,442	4,616	0	50,058	0	0
31	Juris Diff & Nonreg Net Income	0	0	0	0	0	0
32	Extraordinary Items	0	0	0	0	0	0
33	**Net Income (L29-L30-L31-L32)**	$ 83,312	$ (1,711)	$ (108,015)	$ (26,414)	$ 402	$ (7,770)

U S WEST
Arizona Intrastate Operations
Income Statement Summary
Test Year Ending December 31, 1999
$(000)

		[a] Year Ending December 31, 1999 Intrastate	[b] Commission Adjustments	[c] Proforma Adjustments	[d]=a+b+c Adjusted Test Year	[e] BellCore 3 Year Adjustment	[f] Automatic Adjustment Clause
Revenues							
1	Local Service Revenues	$ 954,934	$ 2,249	$ (28,489)	$ 928,693	$ -	$ 7,932
2	Network Access Service Revenues	121,079	0	(5,827)	115,252	0	0
3	Long Distance Network Service Rev.	30,318	0	(7,905)	22,413	0	0
4	Miscellaneous	142,436	0	(10,594)	131,842	0	0
5	Total Oper. Rev. (L1 thru L4)	1,248,767	2,249	(52,815)	1,198,201	0	7,932
Expenses							
6	Maintenance	266,063	0	16,259	282,322	0	0
7	Engineering Expense	10,710	0	790	11,500	0	0
8	Network Operations	41,575	0	10,624	52,199	0	0
9	Network Administration	2,052	0	285	2,337	0	0
10	Access Expense	20,801	0	2,770	23,571	0	20,522
11	Other	472	0	829	1,301	0	0
12	Total Cost of Svcs & Products(L6 thru L11)	341,672	0	6,048	347,720	0	20,522
13	Customer Operations	190,243	0	29,048	219,291	0	0
14	Corporate Operations	186,490	0	20,485	206,976	0	0
15	Property & Other Taxes	51,586	3	(3,548)	48,040	0	23
16	Uncollectibles	18,644	42	(2,206)	16,481	0	380
17	Tot Selling, Gen. & Admin.(L13 thru L16)	446,964	45	43,779	490,788	0	403
18	Other Operating Income & Expense	18	463	(307)	174	(673)	0
19	Depreciation Expense	239,714	(13)	89,183	328,884	0	0
20	Universal Service Fund	(1,370)	0	1,370	0	0	0
21	Link Up America	(88)	0	(686)	(774)	0	0
22	Total Operating Expense(L12+L17 thru L21)	1,026,910	495	139,387	1,166,792	(673)	20,924
23	Income From Operations (L5-L22)	221,857	1,754	13,252	236,863	673	(12,993)
Taxes							
24	Federal Income Tax	55,903	(922)	(62,059)	(7,078)	217	(4,184)
25	State & Local Income Tax	17,011	(229)	(15,417)	1,365	54	(1,039)
26	**Net Operating Income (L23-L24-L25)**	$ 148,943	$ 2,905	$ 90,728	$ 242,576	$ 402	$ (7,770)
Other							
27	Nonoperating Income & Expense	19,958	0	0	19,958	0	0
28	Nonoperating Income Tax	230	0	0	230	0	0
29	Net Operating Earnings (L26-L27-L28)	128,755	2,905	90,728	222,388	402	(7,770)
30	Interest Expense	45,442	4,616	0	50,058	0	0
31	Juris Diff & Nonreg Net Income	0	0	0	0	0	0
32	Extraordinary Items	0	0	0	0	0	0
33	**Net Income (L29-L30-L31-L32)**	$ 83,313	$ (1,711)	$ 90,728	$ 172,330	$ 402	$ (7,770)

U S WEST
Arizona Intrastate Operations
Commission Adjustments Summary
Test Year Ending December 31, 1999
$(000)

		Removal of Merger Costs	Disallowance of Non Employee Concession	Customer Deposits Adjustment	Interest Synchronization	Subtotal Commission Adjustments
Revenues						
1	Local Service Revenues	$ -	$ 2,249	$ -	$ -	$ 2,249
2	Network Access Service Revenues	0	0	0	0	0
3	Long Distance Network Service Rev.	0	0	0	0	0
4	Miscellaneous	0	0	0	0	0
5	Total Oper. Rev. (L1 thru L4)	0	2,249	0	0	2,249
Expenses						
6	Maintenance	0	0	0	0	0
7	Engineering Expense	0	0	0	0	0
8	Network Operations	0	0	0	0	0
9	Network Administration	0	0	0	0	0
10	Access Expense	0	0	0	0	0
11	Other	0	0	0	0	0
12	Total Cost of Svcs & Products(L6 thru L11)	0	0	0	0	0
13	Customer Operations	0	0	0	0	0
14	Corporate Operations	0	0	0	0	0
15	Property & Other Taxes	0	3	0	0	3
16	Uncollectibles	0	42	0	0	42
17	Tot Selling, Gen. & Admin.(L13 thru L16)	0	45	0	0	45
18	Other Operating Income & Expense	0	0	463	0	463
19	Depreciation Expense	(13)	0	0	0	(13)
20	Universal Service Fund	0	0	0	0	0
21	Link Up America	0	0	0	0	0
22	Total Operating Expense(L12+L17 thru L21)	(13)	45	463	0	495
23	Income From Operations (L5-L22)	13	2,204	(463)	0	1,754
Taxes						
24	Federal Income Tax	9	710	(42)	(1,599)	(922)
25	State & Local Income Tax	2	176	(10)	(397)	(229)
26	**Net Operating Income (L23-L24-L25)**	$ 2	$ 1,318	$ (411)	$ 1,996	$ 2,905
Other						
27	Nonoperating Income & Expense	0	0	0	0	0
28	Nonoperating Income Tax	0	0	0	0	0
29	Net Operating Earnings (L26-L27-L28)	2	1,318	(411)	1,996	2,905
30	Interest Expense	(16)	0	(333)	4,965	4,616
31	Juris Diff & Nonreg Net Income	0	0	0	0	0
32	Extraordinary Items	0	0	0	0	0
33	**Net Income (L29-L30-L31-L32)**	$ 18	$ 1,318	$ (78)	$ (2,969)	$ (1,711)

U S WEST
Arizona Intrastate Operations
Commission Adjustments Summary
Test Year Ending December 31, 1999
$(000)

		Removal of Merger Costs	Disallowance of Non Employee Concession	Customer Deposits Adjustment	Interest Synchronization	Subtotal Commission Adjustments
Revenues						
1	Local Service Revenues	$ -	$ 2,249	$ -	$ -	$ 2,249
2	Network Access Service Revenues	0	0	0	0	0
3	Long Distance Network Service Rev.	0	0	0	0	0
4	Miscellaneous	0	0	0	0	0
5	Total Oper. Rev. (L1 thru L4)	0	2,249	0	0	2,249
Expenses						
6	Maintenance	0	0	0	0	0
7	Engineering Expense	0	0	0	0	0
8	Network Operations	0	0	0	0	0
9	Network Administration	0	0	0	0	0
10	Access Expense	0	0	0	0	0
11	Other	0	0	0	0	0
12	Total Cost of Svcs & Products(L6 thru L11)	0	0	0	0	0
13	Customer Operations	0	0	0	0	0
14	Corporate Operations	0	0	0	0	0
15	Property & Other Taxes	0	3	0	0	3
16	Uncollectibles	0	42	0	0	42
17	Tot Selling, Gen. & Admin.(L13 thru L16)	0	45	0	0	45
18	Other Operating Income & Expense	0	0	463	0	463
19	Depreciation Expense	(13)	0	0	0	(13)
20	Universal Service Fund	0	0	0	0	0
21	Link Up America	0	0	0	0	0
22	Total Operating Expense(L12+L17 thru L21)	(13)	45	463	0	495
23	Income From Operations (L5-L22)	13	(686)	(463)	0	(1,136)
Taxes						
24	Federal Income Tax	9	13,252	(42)	(1,599)	11,620
25	State & Local Income Tax	2	176	(10)	(397)	(229)
26	**Net Operating Income (L23-L24-L25)**	$ 2	$ (14,114)	$ (411)	$ 1,996	$ (12,527)
Other						
27	Nonoperating Income & Expense	0	0	0	0	0
28	Nonoperating Income Tax	0	0	0	0	0
29	Net Operating Earnings (L26-L27-L28)	2	(14,114)	(411)	1,996	(12,527)
30	Interest Expense	(16)	0	(333)	4,965	4,616
31	Juris Diff & Nonreg Net Income	0	0	0	0	0
32	Extraordinary Items	0	0	0	0	0
33	**Net Income (L29-L30-L31-L32)**	$ 18	$ (14,114)	$ (78)	$ (2,969)	$ (17,143)

U S WEST

Arizona Intrastate Operations
Commission Adjustment

Removal of 1991 Merger Costs

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		(13)
Total Operating Income Taxes		11
Net Operating Income		2
Rate Base		0
Revenue Requirement	$	(3)

In Docket No. (E1051-89-311), the Arizona Corporation Commission disallowed costs associated with the merger of the three operating companies owned by U S WEST (Mountain States Telephone and Telegraph, Pacific Northwest Bell, Northwestern Bell). The merger was effective January 1, 1991 and the costs are still being amortized. This adjustment removes the amortization of merger costs from the test period.

U S WEST

Arizona Intrastate Operations
Commission Adjustment

Disallowance of Non-Employee Concessions

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	2,249
Operating Expenses		45
Total Operating Income Taxes		886
Net Operating Income		1,318
Rate Base		0
Revenue Requirement	$	(2,248)

In Decisions 53849, 54843 & 58927, the Arizona Corporation Commission disallowed non-employee concession for retired employees and other special interest groups (i.e. clergy, etc.). This adjustment removes the non-employee concession from test year results.

U S WEST

Arizona Intrastate Operations
Commission Adjustment

Customer Deposits Adjustment

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		463
Total Operating Income Taxes		(52)
Net Operating Income		(411)
Rate Base		(2,015)
Revenue Requirement	$	328

In Decisions 53849 and 54843 (Docket Nos. E-1051-83-035 and E-1051-84-100) the Arizona Corporation Commission ordered U S WEST to reflect customer deposits as 100% intrastate and to bring the associated interest into regulated operating results. This adjustment reflects the order at end-of-period test year levels.

U S WEST

Arizona Intrastate Operations
Commission Adjustment

Cash Working Capital

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		0
Total Operating Income Taxes		0
Net Operating Income		0
Rate Base		(14,813)
Revenue Requirement	$	(2,744)

In Decision 54843 (Docket No. E-1051-84-100) the Arizona Corporation Commission adopted Staff's recommendation to exclude non-cash items in the lead-lag studies to determine the amount of cash working capital. This adjustment removes the non-cash items from the rate base.

U S WEST

Arizona Intrastate Operations
Commission Adjustment

Interest Synchronization

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		0
Total Operating Income Taxes		(1,996)
Net Operating Income		1,996
Rate Base		0
Revenue Requirement	$	(3,405)

In Decisions 54843, 53849 and 58927 (Docket Nos. E-1051-84-100, E-1051-83-035 and E-1051-93-183), the Arizona Corporation Commission ordered synchronization of interest expense. This adjustment synchronizes interest expense to the adjusted rate base for the test year.

U S WEST
Arizona Intrastate Operations
Proforma Adjustments Summary
Test Year Ending December 31, 1999
$(000)

		[a] End of Period Annualization	[b] Wage Adjustment	[c] Depreciation	[d] Pension Asset	[e] OPEB Adjustment	[f] Remove Cable Franchise	[g] Access Line Sale	[h]=sum(a.g) Summary Proforma Adj's
	Revenues								
1	Local Service Revenues	$ 12,444	$ -	$ -	$ -	$ -	$ -	$ (48,865)	$ (36,421)
2	Network Access Service Revenues	1,983	0	0	0	0	0	(7,810)	(5,827)
3	Long Distance Network Service Rev.	(3,306)	0	0	0	0	0	(4,599)	(7,905)
4	Miscellaneous	(7,192)	0	0	0	0	0	(3,402)	(10,594)
5	Total Oper. Rev. (L1 thru L4)	3,929	0	0	0	0	0	(64,676)	(60,747)
	Expenses								
6	Maintenance	1,168	6,527	0	0	8,564	0	0	16,259
7	Engineering Expense	208	143	0	0	439	0	0	790
8	Network Operations	2,315	1,099	0	0	7,210	0	0	10,624
9	Network Administration	103	50	0	0	132	0	0	285
10	Access Expense	(17,752)	0	0	0	0	0	0	(17,752)
11	Other	726	41	0	0	62	0	0	829
12	Total Cost of Svcs & Products(L6 thru L11)	(13,232)	7,860	0	0	16,408	0	(25,510)	(14,474)
13	Customer Operations	23,288	3,984	0	0	10,031	0	(8,255)	29,048
14	Corporate Operations	17,855	1,266	0	0	1,364	0	0	20,485
15	Property & Other Taxes	170	0	0	0	0	0	(3,741)	(3,571)
16	Uncollectibles	(1,469)	0	0	0	0	0	(1,117)	(2,586)
17	Tot Selling, Gen. & Admin.(L13 thru L16)	39,844	5,250	0	0	11,395	0	(13,113)	43,377
18	Other Operating Income & Expense	366	0	0	0	0	0	0	366
19	Depreciation Expense	0	0	107,968	0	0	0	(18,785)	89,183
20	Universal Service Fund	1,370	0	0	0	0	0	0	1,370
21	Link Up America	(29)	0	0	0	0	0	0	(29)
22	Total Operating Expense(L12+L17 thru L21)	26,319	13,110	107,968	0	27,803	0	(57,407)	119,793
23	Income From Operations (L5-L22)	(24,390)	(13,110)	(107,968)	0	(27,803)	0	(7,268)	(180,539)
	Taxes								
24	Federal Income Tax	(7,812)	(4,221)	(34,766)	0	(8,953)	0	(2,340)	(58,092)
25	State & Local Income Tax	(1,941)	(1,049)	(8,637)	0	(2,224)	0	(581)	(14,432)
26	**Net Operating Income (L23-L24-L25)**	$ (14,637)	$ (7,840)	$ (64,565)	$ -	$ (16,626)	$ -	$ (4,347)	$ (108,015)
	Other								
27	Nonoperating Income & Expense	0	0	0	0	0	0	0	0
28	Nonoperating Income Tax	0	0	0	0	0	0	0	0
29	Net Operating Earnings (L26-L27-L28)	(14,637)	(7,840)	(64,565)	0	(16,626)	0	(4,347)	(108,015)
30	Interest Expense	0	0	0	0	0	0	0	0
31	Juris Diff & Nonreg Net Income	0	0	0	0	0	0	0	0
32	Extraordinary Items	0	0	0	0	0	0	0	0
33	**Net Income (L29-L30-L31-L32)**	$ (14,637)	$ (7,840)	$ (64,565)	$ -	$ (16,626)	$ -	$ (4,347)	$ (108,015)

U S WEST
Arizona Intrastate Operations
Proforma Adjustments Summary
Test Year Ending December 31, 1999
$(000)

		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]=sum(a.g)
		End of Period Annualization	Wage Adjustment	Depreciation	Pension Asset	OPEB Adjustment	Remove Cable Franchise	Access Line Sale	Summary Proforma Adj's
	Revenues								
1	Local Service Revenues	$ 12,444	$ -	$ -	$ -	$ -	$ -	$ (48,865)	$ (36,421)
2	Network Access Service Revenues	1,983	0	0	0	0	0	(7,810)	(5,827)
3	Long Distance Network Service Rev.	(3,306)	0	0	0	0	0	(4,599)	(7,905)
4	Miscellaneous	(7,192)	0	0	0	0	0	(3,402)	(10,594)
5	Total Oper. Rev. (L1 thru L4)	3,929	0	0	0	0	0	(64,676)	(60,747)
	Expenses								
6	Maintenance	1,168	6,527	0	0	8,564	0	0	16,259
7	Engineering Expense	208	143	0	0	439	0	0	790
8	Network Operations	2,315	1,099	0	0	7,210	0	0	10,624
9	Network Administration	103	50	0	0	132	0	0	285
10	Access Expense	(17,752)	0	0	0	0	0	0	(17,752)
11	Other	726	41	0	0	62	0	0	829
12	Total Cost of Svcs & Products(L6 thru L11)	(13,232)	7,860	0	0	16,408	0	(25,510)	(14,474)
13	Customer Operations	23,288	3,984	0	0	10,031	0	(8,255)	29,048
14	Corporate Operations	17,855	1,266	0	0	1,364	0	0	20,485
15	Property & Other Taxes	170	0	0	0	0	0	(3,741)	(3,571)
16	Uncollectibles	(1,469)	0	0	0	0	0	(1,117)	(2,586)
17	Tot Selling, Gen. & Admin.(L13 thru L16)	39,844	5,250	0	0	11,395	0	(13,113)	43,377
18	Other Operating Income & Expense	366	0	0	0	0	0	0	366
19	Depreciation Expense	0	0	107,968	0	0	0	(18,785)	89,183
20	Universal Service Fund	1,370	0	0	0	0	0	0	1,370
21	Link Up America	(29)	(686)	0	0	0	0	0	(715)
22	Total Operating Expense(L12+L17 thru L21)	28,319	12,424	107,968	0	27,803	0	(57,407)	119,107
23	Income From Operations (L5-L22)	(24,390)	13,252	(107,968)	0	(27,803)	0	(7,268)	(154,177)
	Taxes								
24	Federal Income Tax	(7,812)	(4,221)	(34,766)	0	(8,953)	0	(2,340)	(58,092)
25	State & Local Income Tax	(1,941)	(1,049)	(8,637)	0	(2,224)	0	(581)	(14,432)
26	**Net Operating Income (L23-L24-L25)**	$ (14,637)	$ 18,522	$ (64,565)	$ -	$ (16,626)	$ -	$ (4,347)	(81,653)
	Other								
27	Nonoperating Income & Expense	0	0	0	0	0	0	0	0
28	Nonoperating Income Tax	0	0	0	0	0	0	0	0
29	Net Operating Earnings (L26-L27-L28)	(14,637)	18,522	(64,565)	0	(16,626)	0	(4,347)	(81,653)
30	Interest Expense	0	0	0	0	0	0	0	0
31	Juris Diff & Nonreg Net Income	0	0	0	0	0	0	0	0
32	Extraordinary Items	0	0	0	0	0	0	0	0
33	**Net Income (L29-L30-L31-L32)**	$ (14,637)	$ 18,522	$ (64,565)	$ -	$ (16,626)	$ -	$ (4,347)	$ (81,653)

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

End of Period Annualization Adjustment

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	3,929
Operating Expenses		28,319
Total Operating Income Taxes		(9,753)
Net Operating Income		(14,637)
Rate Base		0
Revenue Requirement	$	24,966

In Decision 58927 (Docket No. E-1051-93-183) the Arizona Corporation Commission ordered U S WEST to synchronize test year revenues and various expenses with the end-of period rate base. This adjustment synchronizes the entire income statement with the end-of-period rate base.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Test Year Ended December 31, 1999

Wage and Salary Increase

$(000)

Operating Revenues	$	0
Operating Expenses		13,110
Total Operating Income Taxes		(5,270)
Net Operating Income		(7,840)
Rate Base		0
Revenue Requirement	$	13,373

On March 1, 2000 U S WEST incurred additional salary expenses for management employees. Effective August 15, 2000 U S WEST will incur additional wage expenses for occupational employees. This adjustment reflects the salary and wage increases.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Depreciation

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		107,968
Total Operating Income Taxes		(43,403)
Net Operating Income		(64,565)
Rate Base		(64,565)
Revenue Requirement	$	98,169

This adjustment reflects the annual impact on the end of period 1999 investment of the April 25, 2000 order in U S WEST Communications' depreciation case , Docket No. T-01051B-97-0689

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Pension Asset

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		0
Total Operating Income Taxes		0
Net Operating Income		0
Rate Base		66,221
Revenue Requirement	$	12,267

This adjustment reflects inclusion of the shareholder funded Pension Asset in Rate Base.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

PBOB Adjustment

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		27,803
Total Operating Income Taxes		(11,177)
Net Operating Income		(16,626)
Rate Base		5,585
Revenue Requirement	$	29,394

This adjustment is required to reflect Post Employment Benefits other than Pensions based on SFAS 106.

U S WEST

Arizona Intrastate Operations
Proforma Adjustment

Remove Cable Services Investment

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		0
Total Operating Income Taxes		0
Net Operating Income		0
Rate Base		(6,792)
Revenue Requirement	$	(1,258)

This adjustment removes Cable Services Investment from U S WEST Communications regulated books. The request to transfer these investments is currently before the Commission in Docket No. T-01051B-99-0499.

U S West Communications

Arizona Intrastate Operations
Ratemaking Adjustment

Arizona Access Line Sale

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	(64,676)
Operating Expenses		(57,407)
Total Operating Income Taxes		(2,921)
Net Operating Income		(4,347)
Rate Base		(103,334)
Revenue Requirement	$	(11,726)

This adjustment removes the revenue, expenses, and investment of the exchanges being sold to Citizen's Utility Company. This sale is being addressed in Docket No. T-01051B-99-0737.

U S WEST

Arizona Intrastate Operations
Three Year Revenue Requirement Adjustment

Gain from Bellcore Sale

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	0
Operating Expenses		(673)
Total Operating Income Taxes		271
Net Operating Income		402
Rate Base		0
Revenue Requirement	$	(686)

In Decision 60382 Docket No.(E-1051-97-139) the Arizona Corporation Commission approved U S WEST's sale of its share in Bellcore. The Commission also deferred ratemaking treatment to the next general rate case. Consistent with that order, U S WEST proposes that 50% of the intrastate gain on the sale be amortized to the ratepayers over three years. This adjustment accounts for that proposed treatment.

U S WEST

Arizona Intrastate Operations
Automatic Adjustment Mechanism

Reciprocal Compensation

Test Year Ending December 31, 1999

$(000)

Operating Revenues	$	7,932
Operating Expenses		20,924
Total Operating Income Taxes		(2,078)
Net Operating Income		(7,770)
Rate Base		0
Revenue Requirement	$	13,253

This adjustment sets forth the initial revenue requirement related to reciprocal compensation under an automatic adjustment mechanism. If adopted, the amount shown should be adjusted to the calendar quarter immediately preceding implementation of rates in this docket.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-1051B-99-105 AFFIDAVIT OF GEORGE REDDING
STATE OF COLORADO	)	
	:	SS
COUNTY OF DENVER	)	

George Redding, of lawful age being first duly sworn, deposes and states:

1. My name is George Redding. I am Director – Regulatory Finance of U S WEST Communications in Denver, Colorado.

2. Attached hereto and made a part hereof for all purposes is my third supplemental testimony.

3. I hereby swear and affirm that my answers contained in the attached third supplemental testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

George Redding

SUBSCRIBED AND SWORN to before me this 28th day of April, 2000.

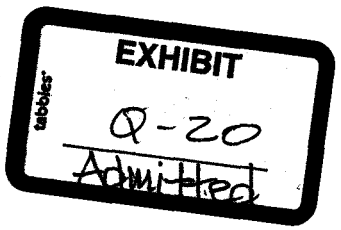
WILLIAM R. CURTIS NOTARY PUBLIC STATE OF COLORADO

Notary Public

My Commission Expires:

My Commission Expires 10/28/2003

BEFORE THE ARIZONA CORPORATION COMMISSION



IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-01051B-99-105

DIRECT TESTIMONY OF

KERRY DENNIS WU

ON BEHALF OF

U S WEST

MAY 3, 2000

TESTIMONY OF KERRY DENNIS WU

INDEX OF TESTIMONY

I. TESTIMONY

EXECUTIVE SUMMARY i

IDENTIFICATION OF WITNESS 1

PURPOSE OF TESTIMONY 2

TESTIMONY 2

II. EXHIBITS

U S WEST Statements with January 6, 2000 and April 25, 2000 Ordered Parameters, Lives and Rates KDW-1

Change in Depreciation Accruals Resulting from Changes in Depreciation Rates Using Investment 12/31/99 Balances – Intrastate Factors Applied KDW-2

EXECUTIVE SUMMARY

My testimony introduces the rates and lives the Commission ordered to be used in the Company's rate case. The attached exhibit KDW-1 shows the depreciation lives and rates that have been incorporated into the Company's updated filing.

Based on 1/1/97 investment balances, current depreciation rates increase depreciation expense by $79.2 million. Utilizing end-of-period 12/31/99 investment balances to conform with the new 1999 test period, the current depreciation rates result in a $99.7 million increase.

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is Kerry Dennis Wu. My title is Director - Capital Recovery for U S WEST Communications, Inc. (U S WEST). My business address is 1600 7th Avenue, Room 3006, Seattle, Washington 98191.

Q. PLEASE GIVE A BRIEF OUTLINE OF YOUR EDUCATIONAL BACKGROUND AND TELEPHONE COMPANY EXPERIENCE.

A. I graduated from Portland State University in 1974, where I earned Bachelor of Science degrees in Business Administration and Science. In 1995, I received a Masters of Business Administration from the University of Washington. In addition, I am a Certified Internal Auditor, a Certified Management Accountant and a Certified Public Accountant.

I began working for Pacific Northwest Bell (PNB) in 1974 as an internal auditor specializing in accounting and financial issues. I later managed Corporate Books and was responsible for closing the Company's books and preparation of Securities and Exchange Commission Filings. I subsequently managed Corporate Budget preparation. In the regulatory area, I supported U S WEST's rate of return advocacy by preparing testimony and related materials. In 1996, I worked for a London based mobile phone company, where I was responsible for mechanizing annual regulatory filings and developing tariffs. Upon returning to the States, I accepted a position with AirTouch Cellular as a budget analyst. In mid-1998, I was appointed the Director – Capital Recovery at U S WEST.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to show the depreciation lives and rates resulting from the Commission most recent depreciation decisions. Current depreciation rates have been incorporated into the Company's updated rate case filing.

TESTIMONY

Q. WHAT DEPRECIATION RATES DID THE COMMISSION ORDER TO USED IN THE RATE CASE?

A. The lives and rates are shown on the attached exhibit KDW-1.

Q. WHAT IS THE EFFECT OF CURRENT DEPRECIATION RATES ON ARIZONA'S ANNUAL INTRASTATE DEPRECIATION ACCRUAL.

A. Based on 1/1/97 investment balances, the current rates increase depreciation rates by $79.2 million. Utilizing end-of-period 12/31/99 investment balances to conform with the new December 1999 test period, current rates result in a $99.7 million increase. The application of the ordered depreciation rates to the 12/31/99 Arizona intrastate investment balances is shown on Exhibit KDW-2.

Q. WHY DOES THE DEPRECIATION EXPENSE EFFECT OF RECENTLY ORDERED DEPRECIATION RATES CHANGE FROM $79.2 MILLION TO $99.7 MILLION?

A. The $79.2 million amount was based on investment levels as of 1/1/97, the date of the filed study. Since that time, U S WEST has made substantial investments in Arizona. The updated test year calculation utilizes investment levels as of 12/31/99. The change from $79.2 million to $99.7 million represents the effect of three years of continuing investment in Arizona.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-01051B-99-105

EXHIBITS OF

KERRY DENNIS WU

ON BEHALF OF

U S WEST

MAY 3, 2000

SUMMARY OF DEPRECIATION RATES
ALL VINTAGE RECOVERY

		DEPRECIATION RATES IN EFFECT 12/31/1996				RATES EFFECTIVE IN 1997			
ACCOUNT NUMBER	CLASS OR SUBCLASS OF PLANT	REM LIFE YEARS	RESERVE %	FUTURE NET SALVAGE %	RATE %	REM LIFE YEARS	RESERVE %	FUTURE NET SALVAGE %	RATE %
		A	B	C	D	E	F	G	H
2112	MOTOR VEHICLES	3.9	41.0	18.0	10.5	3.6	66.4	16.0	4.9
2114	SPEC PURPOSE VEHICLE	8.4	24.0	23.0	5.9	9.8	0.0	0.0	10.2
2115	GARAGE WORK EQUIP	9.0	16.9	23.0	6.7	10.2	-55.1	-4.0	15.6
2116	OTHER WORK EQUIP	8.4	27.7	23.0	5.9	5.4	7.2	7.0	15.9
2121	BUILDINGS	28.0	15.4	-10.0	3.4	26.0	29.2	-6.0	3.0
2122	FURNITURE	10.1	20.4	3.0	7.6	5.5	-10.8	0.0	20.1
2123.1	OFFICE EQUIPMENT	7.1	28.8	5.0	9.3	3.3	26.3	0.0	22.3
2123.2	COMPANY COMM EQUIP	3.3	62.1	1.0	11.2	5.3	67.7	0.0	6.1
2124	GEN PURPOSE CMPTR	3.0	42.9	5.0	17.4	2.4	72.4	5.0	9.4
2211	ANALOG SW EQUIP	8.4	34.7	2.0	7.5	3.4	44.8	0.0	16.2
2212	DIGITAL SW EQUIP	10.4	16.3	3.0	7.8	5.4	37.5	3.0	11.0
2220	OPERATOR SYSTEMS	1.4	4.1	3.0	66.4	4.1	96.6	-3.0	1.6
2231	RADIO SYSTEMS	8.1	34.5	-8.0	9.1	6.6	64.0	-2.0	5.8
2232	CIRCUIT EQUIP								
	CIRCUIT DDS	4.0	50.5	-4.0	13.4	4.0	75.4	3.0	5.4
	CIRCUIT DIGITAL	7.9	27.8	3.0	8.8	5.1	47.8	2.0	9.8
	CIRCUIT ANALOG	5.0	39.1	3.0	11.6	3.3	89.3	0.0	3.2
2351	PUB TEL TERM EQUIP	2.7	94.6	1.0	1.6	3.6	77.8	30.0	0.0
2362	OTHER TERM EQUIP	4.7	45.9	3.0	10.9	6.4	49.9	2.0	7.5
2411	POLE LINES	15.6	55.9	-49.0	6.0	26.0	71.6	-138.0	6.4
2421	AERIAL CABLE MET	9.3	27.3	-23.0	10.3	5.2	61.5	-27.0	12.6
2421	AERIAL CABLE NON MET	15.5	4.0	-27.0	7.9	13.1	12.5	-27.0	8.7
2422	UNDGRD CABLE MET	13.8	24.9	-9.0	6.1	5.8	50.8	-6.0	9.5
2422	UNDGRD CABLE NON MET	18.7	7.8	-21.0	6.1	7.7	26.5	-6.0	10.3
2423	BURIED CABLE MET	14.8	25.7	-2.0	5.2	5.6	40.0	-7.0	12.0
2423	BURIED CABLE NON MET	20.0	10.0	-9.0	5.0	12.9	24.8	-7.0	6.4
2424	SUB CABLE MET	22.0	-80.9	0.0	8.2	1.4	-20.6	0.0	86.1
2424	SUB CABLE NON MET	13.9	36.8	0.0	14.0	0.0	0.0	0.0	0.0
2426	INTRA BLDG CA MET	14.1	53.1	-12.0	4.2	8.3	70.7	0.0	3.5
2426	INTRA BLDG NON MET	12.5	-14.0	-33.0	11.8	6.1	20.2	0.0	13.1
2431	AERIAL WIRE	12.0	12.2	-32.0	10.0	5.5	16.8	-30.0	20.6
2441	CONDUIT SYSTEMS	47.0	16.2	-11.0	2.0	44.0	21.1	-20.0	2.2

CHANGE IN ANNUAL DEPRECIATION ACCRUALS
RESULTING FROM CHANGES IN DEPRECIATION RATES
($000)

			RATES EFFECTIVE 12/31/1996			RATES EFFECTIVE IN 1997			
ACCOUNT NUMBER	CLASS OR SUBCLASS OF PLANT	INVESTMENT 1/1/97	RATE AMOUNT	AMORT AMOUNT	TOTAL	RATE AMOUNT	AMORT AMOUNT	TOTAL	CHANGE IN ACCRUALS
		I	J=D*I	K	L=J+K	M=H*I	N	O=M+N	P=O-L
2112	MOTOR VEHICLES	53,010	5,566	0	5,566	2,597	0	2,597	-2,969
2114	SPEC PURPOSE VEHICLE	26	2	0	2	3	0	3	1
2115	GARAGE WORK EQUIP	1,308	88	0	88	204	0	204	116
2116	OTHER WORK EQUIP	23,811	1,405	0	1,405	3,786	0	3,786	2,381
2121	BUILDINGS	153,169	5,208	0	5,208	4,595	0	4,595	-613
2122	FURNITURE	1,792	136	0	136	360	0	360	224
2123.1	OFFICE EQUIPMENT	6,039	562	0	562	1,347	0	1,347	785
2123.2	COMPANY COMM EQUIP	18,348	2,055	0	2,055	1,119	0	1,119	-936
2124	GEN PURPOSE CMPTR	164,621	28,644	0	28,644	15,474	0	15,474	-13,170
2211	ANALOG SW EQUIP	235,804	17,685	0	17,685	38,200	0	38,200	20,515
2212	DIGITAL SW EQUIP	607,055	47,350	0	47,350	66,776	0	66,776	19,426
2220	OPERATOR SYSTEMS	9,204	6,111	0	6,111	147	0	147	-5,964
2231	RADIO SYSTEMS	39,446	3,590	0	3,590	2,288	0	2,288	-1,302
2232	CIRCUIT EQUIP								
	CIRCUIT DDS	12,049	1,615	0	1,615	651	0	651	-964
	CIRCUIT DIGITAL	878,564	77,314	0	77,314	86,099	0	86,099	8,785
	CIRCUIT ANALOG	67,630	7,845	0	7,845	2,164	0	2,164	-5,681
2351	PUB TEL TERM EQUIP	15,068	241	0	241	0	0	0	-241
2362	OTHER TERM EQUIP	39,215	4,274	0	4,274	2,941	0	2,941	-1,333
2411	POLE LINES	42,411	2,545	0	2,545	2,714	0	2,714	169
2421	AERIAL CABLE MET	142,374	14,665	0	14,665	17,939	0	17,939	3,274
2421	AERIAL CABLE NON MET	5,616	444	0	444	489	0	489	45
2422	UNDGRD CABLE MET	315,966	19,274	0	19,274	30,017	0	30,017	10,743
2422	UNDGRD CABLE NON MET	74,447	4,541	0	4,541	7,668	0	7,668	3,127
2423	BURIED CABLE MET	1,010,069	52,524	0	52,524	121,208	0	121,208	68,684
2423	BURIED CABLE NON MET	16,552	828	0	828	1,059	0	1,059	231
2424	SUB CABLE MET	3	0	0	0	3	0	3	3
2424	SUB CABLE NON MET	0	0	0	0	0	0	0	0
2426	INTRA BLDG CA MET	38,068	1,599	0	1,599	1,332	0	1,332	-267
2426	INTRA BLDG NON MET	327	39	0	39	43	0	43	4
2431	AERIAL WIRE	6,438	644	0	644	1,326	0	1,326	682
2441	CONDUIT SYSTEMS	271,676	5,434	0	5,434	5,977	0	5,977	543
	TOTALS	4,250,106	312,228	0	312,228	418,526	0	418,526	106,298
	COMPOSITES				7.3			9.8	

SUMMARY OF RESERVES 1-1-1997

ACCOUNT	CATEGORY	1-1-97 INVESTMENT	BOOK RESERVE AMOUNT	BOOK RESERVE PERCENT	AVERAGE SERVICE LIFE	AVERAGE REM LIFE	AVERAGE NET SALVAGE	FUTURE NET SALVAGE	THEORETICAL RESERVE AMOUNT	THEORETICAL RESERVE PERCENT
		A$	B$	C=B/A	D	E	F	G	H$	I
2112	MOTOR VEHICLES	53,009,820	35,179,798	66.4	9.2	3.6	15	16	26,875,979	50.7
2114	SPEC PURPOSE VEHICLE	25,794	0	0.0	14.2	9.8	0	0	7,996	31.0
2115	GARAGE WORK EQUIP	1,308,374	-720,784	-55.1	12.3	10.2	-24	-4	15,700	1.2
2116	OTHER WORK EQUIP	23,811,229	1,722,644	7.2	10.3	5.4	9	7	10,786,487	45.3
2121	BUILDINGS	153,169,412	44,748,255	29.2	37.0	26.0	2	-6	56,825,852	37.1
2122	FURNITURE	1,791,709	-193,966	-10.8	9.4	5.5	3	0	774,018	43.2
2123.1	OFFICE EQUIPMENT	6,038,976	1,588,990	26.3	8.5	3.3	0	0	3,695,853	61.2
2123.2	COMPANY COMM EQUIP	18,347,890	12,430,681	67.7	8.5	5.3	0	0	6,898,807	37.6
2124	GEN PURPOSE CMPTR	164,621,049	119,184,148	72.4	6.2	2.4	6	5	96,467,935	58.6
2211	ANALOG SW EQUIP	235,804,048	105,603,265	44.8	9.8	3.4	6	0	158,931,928	67.4
2212	DIGITAL SW EQUIP	607,055,415	227,681,277	37.5	9.3	5.4	3	3	247,071,554	40.7
2220	OPERATOR SYSTEMS	9,204,282	8,887,798	96.6	11.0	4.1	-3	-3	5,945,966	64.6
2231	RADIO SYSTEMS	39,445,929	25,263,128	64.0	14.9	6.6	-1	-2	22,602,517	57.3
2232	CIRCUIT EQUIP									
	CIRCUIT DDS	12,048,810	9,084,651	75.4	8.1	4.0	8	3	6,217,186	51.6
	CIRCUIT DIGITAL	878,564,418	419,570,151	47.8	9.5	5.1	2	2	398,868,246	45.4
	CIRCUIT ANALOG	67,630,476	60,421,492	89.3	12.1	3.3	-1	0	49,032,095	72.5
2351	PUB TEL TERM EQUIP	15,068,490	11,722,281	77.8	7.2	3.6	30	30	5,273,972	35.0
2362	OTHER TERM EQUIP	39,214,535	19,553,010	49.9	9.0	6.4	8	2	12,783,938	32.6
2411	POLE LINES	42,410,540	30,357,356	71.6	34.0	26.0	-86	-138	40,629,297	95.8
2421	AERIAL CABLE MET	142,374,081	87,505,429	61.5	13.7	5.2	-21	-27	115,465,380	81.1
2421	AERIAL CABLE NON MET	5,616,138	704,138	12.5	15.0	13.1	-27	-27	904,198	16.1
2422	UNDGRD CABLE MET	315,966,087	160,576,546	50.8	18.1	5.8	-6	-6	227,495,583	72.0
2422	UNDGRD CABLE NON MET	74,447,014	19,746,787	26.5	13.0	7.7	-6	-6	32,161,110	43.2
2423	BURIED CABLE MET	1,010,068,793	404,260,231	40.0	13.6	5.6	-7	-7	635,333,271	62.9
2423	BURIED CABLE NON MET	16,551,957	4,108,316	24.8	18.0	12.9	-7	-7	5,015,243	30.3
2424	SUB CABLE MET	2,572	-529	-20.6	15.0	1.4	0	0	2,333	90.7
2424	SUB CABLE NON MET	0	0	0.0	0.0	0.0	0	0	0	0.0
2426	INTRA BLDG CA MET	38,068,059	26,932,096	70.7	19.9	8.3	2	0	22,498,223	59.1
2426	INTRA BLDG NON MET	326,996	66,176	20.2	9.2	6.1	0	0	110,198	33.7
2431	AERIAL WIRE	6,437,962	1,083,329	16.8	9.5	5.5	-25	-30	3,708,266	57.6
2441	CONDUIT SYSTEMS	271,676,174	57,401,705	21.1	57.0	44.0	-20	-20	74,439,272	27.4
	TOTAL	4,250,107,029	1,894,468,399	44.6					2,266,838,403	53.3

CHANGE IN ANNUAL DEPRECIATION ACCRUALS
RESULTING FROM CHANGES IN DEPRECIATION RATES
INTRA STATE FACTORS APPLIED ($000)

			RATES EFFECTIVE 12/31/1996			RATES EFFECTIVE IN 1997			
ACCOUNT NUMBER	CLASS OR SUBCLASS OF PLANT	INVESTMENT 1/1/97	RATE AMOUNT	AMORT AMOUNT	TOTAL	RATE AMOUNT	AMORT AMOUNT	TOTAL	CHANGE IN ACCRUALS
		I	J=D*I	K	L=J+K	M=H*I	N	O=M+N	P=O-L
2112	MOTOR VEHICLES	41,205	4,326	0	4,326	2,019	0	2,019	-2,308
2114	SPEC PURPOSE VEHICLE	20	2	0	2	2	0	2	1
2115	GARAGE WORK EQUIP	1,017	68	0	68	159	0	159	90
2116	OTHER WORK EQUIP	18,508	1,092	0	1,092	2,943	0	2,943	1,851
2121	BUILDINGS	119,059	4,048	0	4,048	3,572	0	3,572	-476
2122	FURNITURE	1,393	106	0	106	280	0	280	174
2123.1	OFFICE EQUIPMENT	4,694	437	0	437	1,047	0	1,047	610
2123.2	COMPANY COMM EQUIP	14,262	1,597	0	1,597	870	0	870	-728
2124	GEN PURPOSE CMPTR	127,960	22,265	0	22,265	12,028	0	12,028	-10,237
2211	ANALOG SW EQUIP	188,502	14,137	0	14,137	30,537	0	30,537	16,400
2212	DIGITAL SW EQUIP	485,280	37,852	0	37,852	53,381	0	53,381	15,529
2220	OPERATOR SYSTEMS	8,487	5,635	0	5,635	136	0	136	-5,499
2231	RADIO SYSTEMS	27,119	2,468	0	2,468	1,573	0	1,573	-895
2232	CIRCUIT EQUIP								
	CIRCUIT DDS	8,284	1,110	0	1,110	448	0	448	-663
	CIRCUIT DIGITAL	604,013	53,153	0	53,153	59,193	0	59,193	6,040
	CIRCUIT ANALOG	46,496	5,393	0	5,393	1,488	0	1,488	-3,906
2351	PUB TEL TERM EQUIP	11,301	181	0	181	0	0	0	-181
2362	OTHER TERM EQUIP	29,411	3,206	0	3,206	2,206	0	2,206	-1,000
2411	POLE LINES	31,329	1,880	0	1,880	2,005	0	2,005	125
2421	AERIAL CABLE MET	105,172	10,833	0	10,833	13,252	0	13,252	2,419
2421	AERIAL CABLE NON MET	4,149	328	0	328	361	0	361	33
2422	UNDGRD CABLE MET	233,404	14,238	0	14,238	22,174	0	22,174	7,936
2422	UNDGRD CABLE NON MET	54,994	3,354	0	3,354	5,664	0	5,664	2,310
2423	BURIED CABLE MET	746,138	38,799	0	38,799	89,536	0	89,536	50,737
2423	BURIED CABLE NON MET	12,227	612	0	612	782	0	782	171
2424	SUB CABLE MET	2	0	0	0	2	0	2	2
2424	SUB CABLE NON MET	0	0	0	0	0	0	0	0
2426	INTRA BLDG CA MET	28,121	1,181	0	1,181	984	0	984	-197
2426	INTRA BLDG NON MET	242	29	0	29	32	0	32	3
2431	AERIAL WIRE	4,756	476	0	476	980	0	980	504
2441	CONDUIT SYSTEMS	200,687	4,014	0	4,014	4,415	0	4,415	401
	TOTALS	3,158,229	232,821	0	232,821	312,066	0	312,066	79,245
	COMPOSITES				7.4			9.9	

SUMMARY OF RESERVES (INTRA STATE FACTORS APPLIED) 1-1-1997

ACCOUNT	CATEGORY	1-1-97 INVESTMENT	BOOK RESERVE AMOUNT	BOOK RESERVE PERCENT	AVERAGE SERVICE LIFE	AVERAGE REM LIFE	AVERAGE NET SALVAGE	FUTURE NET SALVAGE	THEORETICAL RESERVE AMOUNT	THEORETICAL RESERVE PERCENT
		A$	B$	C=B/A	D	E	F	G	H$	I
2112	MOTOR VEHICLES	41,204,533	27,345,257	66.4	9.2	3.6	15	16	20,890,698	50.7
2114	SPEC PURPOSE VEHICLE	20,050	0	0.0	14.2	9.8	0	0	6,215	31.0
2115	GARAGE WORK EQUIP	1,016,999	-560,265	-55.1	12.3	10.2	-24	-4	12,204	1.2
2116	OTHER WORK EQUIP	18,508,468	1,339,011	7.2	10.3	5.4	9	7	8,384,336	45.3
2121	BUILDINGS	119,058,584	34,782,819	29.2	37.0	26.0	2	-6	44,170,735	37.1
2122	FURNITURE	1,392,695	-150,770	-10.8	9.4	5.5	3	0	601,644	43.2
2123.1	OFFICE EQUIPMENT	4,694,096	1,235,122	26.3	8.5	3.3	0	0	2,872,787	61.2
2123.2	COMPANY COMM EQUIP	14,261,815	9,662,368	67.7	8.5	5.3	0	0	5,362,442	37.6
2124	GEN PURPOSE CMPTR	127,959,941	92,641,838	72.4	6.2	2.4	6	5	74,984,526	58.6
2211	ANALOG SW EQUIP	188,501,756	84,419,250	44.8	9.8	3.4	6	0	127,050,184	67.4
2212	DIGITAL SW EQUIP	485,280,099	182,008,413	37.5	9.3	5.4	3	3	197,509,000	40.7
2220	OPERATOR SYSTEMS	8,487,268	8,195,439	96.6	11.0	4.1	-3	-3	5,482,775	64.6
2231	RADIO SYSTEMS	27,119,076	17,368,401	64.0	14.9	6.6	-1	-2	15,539,231	57.3
2232	CIRCUIT EQUIP									
	CIRCUIT DDS	8,283,557	6,245,698	75.4	8.1	4.0	8	3	4,274,315	51.6
	CIRCUIT DIGITAL	604,013,037	288,454,479	47.8	9.5	5.1	2	2	274,221,919	45.4
	CIRCUIT ANALOG	46,495,952	41,539,776	89.3	12.1	3.3	-1	0	33,709,565	72.5
2351	PUB TEL TERM EQUIP	11,301,368	8,791,711	77.8	7.2	3.6	30	30	3,955,479	35.0
2362	OTHER TERM EQUIP	29,410,901	14,664,758	49.9	9.0	6.4	8	2	9,587,954	32.6
2411	POLE LINES	31,328,666	22,424,979	71.6	34.0	26.0	-86	-138	30,012,862	95.8
2421	AERIAL CABLE MET	105,171,734	64,640,260	61.5	13.7	5.2	-21	-27	85,294,276	81.1
2421	AERIAL CABLE NON MET	4,148,641	520,147	12.5	15.0	13.1	-27	-27	667,931	16.1
2422	UNDGRD CABLE MET	233,404,148	118,617,895	50.8	18.1	5.8	-6	-6	168,050,987	72.0
2422	UNDGRD CABLE NON MET	54,994,009	14,586,952	26.5	13.0	7.7	-6	-6	23,757,412	43.2
2423	BURIED CABLE MET	746,137,817	298,627,033	40.0	13.6	5.6	-7	-7	469,320,687	62.9
2423	BURIED CABLE NON MET	12,226,931	3,034,813	24.8	18.0	12.9	-7	-7	3,704,760	30.3
2424	SUB CABLE MET	1,900	-391	-20.6	15.0	1.4	0	0	1,723	90.7
2424	SUB CABLE NON MET	0	0	0.0	0.0	0.0	0	0	0	0.0
2426	INTRA BLDG CA MET	28,120,875	19,894,739	70.7	19.9	8.3	2	0	16,619,437	59.1
2426	INTRA BLDG NON MET	241,552	48,884	20.2	9.2	6.1	0	0	81,403	33.7
2431	AERIAL WIRE	4,755,723	800,255	16.8	9.5	5.5	-25	-30	2,739,296	57.6
2441	CONDUIT SYSTEMS	200,687,190	42,402,639	21.1	57.0	44.0	-20	-20	54,988,290	27.4
	TOTAL	3,158,229,382	1,403,581,508	44.4					1,683,855,075	53.3

PARAMETER REPORT

CATEGORY	FIRST ELG YEAR	P.L. OR AYFR	AVG. NET SALV.	FUTURE NET SALV.	CURVE SHAPE PARAMETERS c	G	S	COMMENTS
2112 MOTOR VEHICLES			15	16				
2112 PASSENGER CARS	1983	8.6	15.4	16.0	IOWA CURVE L3.0			
2112 LIGHT TRUCKS	1983	8.6	15.4	16.0	IOWA CURVE L3.0			
2112 HEAVY TRUCKS	1983	8.6	15.4	16.0	IOWA CURVE L3.0			
2114 SPEC PURPOSE VEHICLES	0	16.1	0	0	IOWA CURVE S6.0			
2115 GARAGE WORK EQUIP	0	13.7	-24	-4	IOWA CURVE L0.0			
2116 OTHER WORK EQUIP	0	11.5	9	7	IOWA CURVE L4.0			
2121 BUILDINGS			2	-6				
2121 LARGE BUILDINGS	1983	43.0	2.0	-6.0	IOWA CURVE R1.0			
2121 OTHER BUILDINGS	1983	43.0	2.0	-6.0	IOWA CURVE R1.0			
2122 FURNITURE	1983	9.5	3	0	IOWA CURVE O4.0			
2123.1 OFFICE EQUIPMENT	1983	7.0	0	0	IOWA CURVE L0.5			
2123.2 COMPANY COMM EQUIP			0	0				
2123.2 STAND ALONE	0	8.3	-0.1	0.0	IOWA CURVE L0.5			
2123.2 PBX & KEY INTRASYSTEMS	0	8.3	-0.1	0.0	IOWA CURVE L0.5			
2124 GEN PURPOSE CMPTR	1983	5.0	6	5	IOWA CURVE O1.0			
2211 ANALOG SW EQUIP	0	2000.0	6	0	CONSTANT RETIREMENT RATE	1.5		
2212 DIGITAL SW EQUIP	1983	10.0	3	3	IOWA CURVE O1.0			
2220 OPERATOR SYSTEMS	1983	10.7	-3	-3	IOWA CURVE S2.0			
2231 RADIO SYSTEMS	1983	15.1	-1	-2	IOWA CURVE S1.5			
2232 CIRCUIT DDS	1983	8.1	8	3	IOWA CURVE L1.0			
2232 CIRCUIT DIGITAL	1983	10.0	2	2	IOWA CURVE O2.0			
2232 CIRCUIT ANALOG	1983	8.0	-1	0	IOWA CURVE L0.0			
2351 PUB TEL TERM EQUIP	0	7.9	30	30	IOWA CURVE S6.0			
2362 OTHER TERM EQUIP	0	6.8	8	2	IOWA CURVE O3.0			
2411 POLE LINES	1982	46.4	-86	-138	IOWA CURVE O1.0			
2421 AERIAL CABLE MET	1982	12.0	-21	-27	IOWA CURVE R1.0			
2421 AERIAL CABLE NON MET	1982	14.5	-27	-27	IOWA CURVE SQ			
2422 UNDGRD CABLE MET	1982	15.0	-6	-6	IOWA CURVE R1.5			
2422 UNDGRD CABLE NON MET	1982	13.1	-6	-6	IOWA CURVE SQ			
2423 BURIED CABLE MET	1982	12.0	-7	-7	IOWA CURVE L1.5			
2423 BURIED CABLE NON MET	1982	17.6	-7	-7	IOWA CURVE SQ			
2424 SUB CABLE MET	1982	15.0	0	0	IOWA CURVE SQ			
2424 SUB CABLE NON MET	1982	9.0	0	0	IOWA CURVE SQ			
2426 INTRA BLDG CA MET	1982	19.0	2	0	IOWA CURVE L2.0			
2426 INTRA BLDG CABLE NON MET	1982	11.5	0	0	IOWA CURVE O1.0			
2431 AERIAL WIRE	0	8.9	-25	-30	IOWA CURVE L0.0			
2441 CONDUIT SYSTEMS	1982	56.6	-20	-20	IOWA CURVE SQ			

Change in Annual Depreciation Accruals Resulting from Changes in Depreciation Rates
Intrastate Factors Applied ($000)

Account Number and Class or Subclass of Plant	Intrastate Investment 12/31/1999 A	Previous Depreciation Rate@ B	Rate Amount C = A * B	Current Depreciation Rate* D	Rate Amount E = A * D	Change in Depreciation Accrual E - C
2112 MOTOR VEHICLES	47,502	10.5%	4,988	4.9%	2,328	(2,660)
2114 SPEC PURPOSE VEHICLES	18	5.9%	1	10.2%	2	1
2115 GARAGE WORK EQUIP	961	6.7%	64	15.6%	150	86
2116 OTHER WORK EQUIP	15,891	5.9%	938	15.9%	2,527	1,589
2121 BUILDINGS	115,383	3.4%	3,923	3.0%	3,461	(462)
2122 FURNITURE	1,208	7.6%	92	20.1%	243	151
2123.1 OFFICE EQUIPMENT	3,883	9.3%	361	22.3%	866	505
2123.2 COMPANY COMM EQUIPMENT	1,040	11.2%	116	6.1%	63	(53)
2124 GEN PURPOSE CMPTR	79,409	17.4%	13,817	9.4%	7,464	(6,353)
2211 ANALOG SW EQUIP	110,824	7.5%	8,312	16.2%	17,953	9,641
2212 DIGITAL SW EQUIP	655,053	7.8%	51,094	11.0%	72,056	20,962
2220 OPERATOR SYSTEMS	6,498	66.4%	4,315	1.6%	104	(4,211)
2231 RADIO SYSTEMS	23,571	9.1%	2,145	5.8%	1,367	(778)
2232 CIRCUIT DDS	5,667	13.4%	759	5.4%	306	(453)
2232 CIRCUIT DIGITAL	752,751	8.8%	66,242	9.8%	73,770	7,528
2232 CIRCUIT ANALOG	32,631	11.6%	3,785	3.2%	1,044	(2,741)
2362 OTHER TERM EQUIP	40,092	10.9%	4,370	7.5%	3,007	(1,363)
2351 PUB TEL TERM EQUIP	17,969	1.6%	288	0.0%	-	(288)
2411 POLE LINES	34,403	6.0%	2,064	6.4%	2,202	138
2421 AERIAL CABLE MET	121,417	10.3%	12,506	12.6%	15,299	2,793
2421 AERIAL CABLE NON MET	4,563	7.9%	360	8.7%	397	37
2422 UNDGRD CABLE MET	257,054	6.1%	15,680	9.5%	24,420	8,740
2422 UNDGRD CABLE NON MET	64,194	6.1%	3,916	10.3%	6,612	2,696
2423 BURIED CABLE MET	927,241	5.2%	48,217	12.0%	111,269	63,052
2423 BURIED CABLE NON MET	12,727	5.0%	636	6.4%	815	179
2424 SUB CABLE MET	2	8.2%	-	86.1%	2	2
2424 SUB CABLE NON MET	-	14.0%	-	0.0%	-	-
2426 INTRA BLDG CABLE MET	30,275	4.2%	1,272	3.5%	1,060	(212)
2426 INTRA BLDG CABLE NON MET	429	11.8%	51	13.1%	56	5
2431 AERIAL WIRE	6,494	10.0%	649	20.6%	1,338	689
2441 CONDUIT SYSTEMS	225,140	2.0%	4,503	2.2%	4,953	450
Total	3,594,290		255,464		355,134	99,670
Composites			7.1%		9.9%	

@ Exhibit KDW-1, Page 1 of 6, Column D
* Exhibit KDW-1, Page 1 of 6, Column H

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	**DOCKET NO. T-1051B-99-105**

STATE OF WASHINGTON)
: ss AFFIDAVIT OF KERRY DENNIS WU
COUNTY OF KING)

Kerry Dennis Wu, of lawful age being first duly sworn, depose and states:

1. My name is Kerry Dennis Wu. I am Director – Capital Recovery of U S WEST Communications in Seattle, Washington.

2. Attached hereto and made a part hereof for all purposes is my testimony consisting of pages 1 through 3, and my exhibits numbered KDW-1 and KDW-2.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Kerry Dennis Wu
Kerry Dennis Wu

SUBSCRIBED AND SWORN to before me this 2nd day of May, 2000.

Elizabeth M Weber
Notary Public residing at
Seattle, Washington.

My Commission Expires: 09/16/02

BEFORE THE ARIZONA CORPORATION COMMISSION

CARL J. KUNASEK
CHAIRMAN
JIM IRVIN
COMMISSIONER
WILLIAM A. MUNDELL
COMMISSIONER

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-1051B-99-105

SUPPLEMENTAL DIRECT TESTIMONY OF

NANCY HELLER HUGHES

U S WEST COMMUNICATIONS

JUNE 9, 2000

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NANCY HELLER HUGHES

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Report Titled "Reproduction Cost New Less Depreciation Study of the Properties of U S WEST Communications Located in the State of Arizona, As of January 1, 1999"	NHH-1

EXECUTIVE SUMMARY

1. CURRENT RESPONSIBILITIES

Ms. Hughes is an Executive Consultant in the Seattle office of R. W. Beck, Inc. She is also an Accredited Senior Appraiser (ASA) in Public Utilities certified by the American Society of Appraisers. At R. W. Beck, Ms. Hughes is responsible for managing projects and performing studies involving utility rates and regulation, cost of service, depreciation and valuation.

2. PURPOSE OF TESTIMONY

Ms. Hughes' testimony presents the results of an updated study conducted by R. W. Beck to determine the estimated Reproduction Cost New Less Depreciation (RCNLD) of the Arizona plant in service of U S WEST Communications, Inc. (U S WEST) as of December 31, 1999. The study is an update of the RCNLD study originally filed in January 1999 in this docket. The updated RCNLD study reflects a test year ending December 31, 1999 and the new depreciation rates recently approved for U S WEST by the Arizona Corporation Commission in Decision No. 62507.

3. SUMMARY OF TESTIMONY

The estimated RCNLD was developed using the same methodology used in previous RCNLD studies for U S WEST or its predecessor, Mountain States Telephone and Telegraph Company, which were accepted with approval by the Arizona Corporation Commission (ACC). The original cost of the property, by account and year of installation, was indexed to current cost using the U S WEST Telephone Plant Index prepared by Joel Popkin and Associates. This index represents the change in price levels from the date of investment to the date of valuation. Depreciation was deducted based upon estimates of life expectancy incorporated in the depreciation rates recently approved for U S WEST by the Arizona Corporation Commission.

The total estimated reproduction cost new and reproduction cost new less depreciation values of the Arizona plant in service of U S WEST as of December 31, 1999 are shown below.

Reproduction Cost New	$6,361,585,948
Reproduction Cost New Less Depreciation	$3,558,480,937
Condition Percent	56%

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is Nancy Heller Hughes. I am an Executive Consultant in the Seattle office of R. W. Beck, Inc. My business address is 1001 Fourth Avenue, Suite 2500, Seattle, Washington 98154-1004.

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS PROCEEDING?

A. Yes. I submitted testimony on behalf of U S WEST in this proceeding on January 8, 1999.

ASSIGNMENT

Q. WHAT WAS YOUR ASSIGNMENT BY THE COMPANY IN THIS CASE?

A. R. W. Beck was initially requested by U S WEST to perform a study to estimate the replacement cost new less depreciation (RCNLD) of its total plant in service located in the State of Arizona as of June 30, 1998. My earlier testimony presented the results of that study. For this supplemental testimony, R. W. Beck was requested by U S WEST to update the RCNLD study to reflect a test year ending December 31, 1999 and to reflect the new depreciation rates recently approved for U S WEST by the Arizona Corporation Commission (ACC) in Decision No. 62507 in Docket No. T-01051B-97-0689.

Q. IS A COPY OF YOUR UPDATED RCNLD STUDY PROVIDED WITH YOUR SUPPLEMENTAL TESTIMONY?

A. Yes. A copy of the updated study entitled "Reproduction Cost New Less Depreciation Study of the Properties of U S WEST Communications Located in the State of Arizona as of December 31, 1999" is provided in Exhibit NHH-1 to this testimony.

METHODOLOGY

Q. PLEASE DEFINE REPRODUCTION COST NEW LESS DEPRECIATION.

A. Reproduction cost new less depreciation (RCNLD) is defined as the cost of constructing an exact replica of the property at current price with the same or closely related materials, less accrued depreciation.

Q. WHAT GENERAL PROCEDURE DID YOU USE TO ESTIMATE THE RCNLD OF U S WEST'S ARIZONA PROPERTIES?

A. The trended original cost approach was used to estimate the RCNLD of U S WEST's Arizona properties. Under this approach, the original cost of the property, by account and year of installation, was indexed to current cost using a cost index that represents the change in price levels from the date of investment to the date of valuation. The trended costs are equal to the estimated reproduction cost new (RCN) of the property. The estimated RCNLD was then determined by subtracting an amount representing the accrued depreciation from the estimated RCN. The amount of accrued depreciation was developed based on the life expectancies and mortality characteristics reflected in U S WEST's authorized depreciation rates.

Q. HAS THE ACC APPROVED PREVIOUS VALUATION STUDIES PREPARED BY R. W. BECK ON BEHALF OF U S WEST?

A. Yes. The ACC has accepted the results of previous RCNLD valuation studies which R. W. Beck has prepared in connection with U S WEST rate filings, including RCNLD studies filed in U S WEST's last two rate cases.

Q. IN UPDATING THE RCNLD STUDY FOR THIS SUPPLEMENTAL TESTIMONY, DID YOU USE THE SAME METHODOLOGY AS WAS USED IN PREVIOUS VALUATION STUDIES OF U S WEST PROPERTY?

A. Yes. The estimated RCNLD as of December 31, 1999 was developed using the same basic procedure and data that were used in previous RCNLD studies performed for U S WEST, including the RCNLD study previously submitted in this proceeding. The RCNLD study was performed using a computer model that R. W. Beck originally developed on behalf of the ACC in connection with a Mountain Bell rate case in 1971. In subsequent rate cases, Mountain Bell or U S WEST has retained R. W. Beck to determine the estimated RCNLD of its Arizona properties using the same methodology approved by the ACC.

ANALYSIS

Q. PLEASE DESCRIBE EXHIBIT NHH-1.

A. Exhibit NHH-1 is a copy of the final report prepared by R. W. Beck presenting the results of the updated RCNLD study of U S WEST's Arizona properties. The report provides a step-by-step description of the analyses performed, describes the source of data used in the analyses, and presents our opinion as to the RCN and RCNLD values of the properties. A detailed summary of the RCN and RCNLD values by plant account is provided in Table 1 of the report. The detailed output from the computer model is provided in Appendix A of the report.

Q. WHAT IS THE SOURCE OF THE ORIGINAL COST DATA USED IN THE RCNLD STUDY?

A. Vintaged plant data, i.e., the original cost of the property by year of installation, is needed when using the trended original cost approach to determine the RCN of the property. Vintaged original cost data for each plant account as of December 31, 1999 was available from U S WEST's Generation Arrangement Data File for Arizona. This data is used to support the depreciation rates prescribed by the ACC. The total original cost as of December 31, 1999 for each account is equal to the plant investment shown on U S WEST's MR2 financial report for Arizona.

Q. WHAT COST INDICES WERE USED TO TREND THE ORIGINAL COST DATA TO REFLECT CURRENT COST?

A. The original cost of the property, by account and year of installation, was indexed to current cost using the U S WEST Telephone Plant Index (TPI) prepared by Joel Popkin and Associates, economic consultants. This index shows the change in cost over time for various types of telephone plant and equipment. A copy of the TPIs used in the study is provided in Appendix B of Exhibit NHH-1.

Q. HOW DID YOU DETERMINE THE AMOUNT OF DEPRECIATION RESERVE TO DEDUCT FROM THE RCN OF THE PROPERTY?

A. The amount of depreciation reserve to be deducted from the RCN was determined by applying a factor known as the "condition percent." The condition percent is defined as the ratio of the

present depreciable value to the depreciable value of the plant when new. Thus, the condition percent when multiplied by the RCN gives the RCN less depreciation (i.e., RCNLD), whereupon the dollar amount of the depreciation reserve may be derived, if desired. A more detailed description of how the condition percent was determined is provided in Exhibit NHH-1.

The use of the condition percent is based on the principle that the value of a piece of property, as affected by all the physical and functional conditions that will ultimately force its retirement from service, depends upon the number of years it can reasonably be expected to give service in the future. To illustrate, if the life expectancy of an existing item of property is estimated to be 15 years but a consistent estimate of its life expectancy if it were new is 20 years, then the remaining service to be expected from the property is 15/20 or 75% of the service to be expected from a new item. On this basis, the present condition percent is 75%.

Q. HOW DID YOU DETERMINE THE LIFE EXPECTANCIES OF THE PLANT IN EACH ACCOUNT?

A. The life expectancies for each plant account were determined based on the survivor curves and average service lives incorporated in U S WEST's authorized depreciation rates for Arizona. A copy of the depreciation parameters used in the study is provided in Appendix C of Exhibit NHH-1. A survivor curve shows the percentage of each vintage, or group of plant placed in service during a single year, which is still surviving in service at a given age. Once the survivor curve is defined, the computer model calculates the life expectancies of the plant when new and at the date of valuation. The condition percent is then equal to the life expec-

tancy of the plant at the date of valuation divided by the life expectancy of the plant when new.

CONCLUSION

Q. WHAT ARE THE RCN AND RCNLD VALUES OF THE ARIZONA PROPERTIES OF U S WEST?

A. Based on the results of our study as described in this testimony and the study report provided in Exhibit NHH-1, the total estimated RCN and RCNLD values of the Arizona plant in service of U S WEST as of December 31, 1999 are shown below:

Reproduction Cost New	$6,361,585,948
Reproduction Cost New Less Depreciation	$3,558,480,937
Condition Percent	56%

Q. HAVE YOU INCLUDED THE DETAILED CALCULATIONS SUPPORTING THIS DETERMINATION OF VALUE?

A. Yes. The detailed calculations supporting our determination of the RCN and RCNLD values are provided in Exhibit NHH-1.

Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL TESTIMONY?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-1051B-99-105

SUPPLEMENTAL EXHIBIT OF

NANCY HELLER HUGHES

U S WEST COMMUNICATIONS

JUNE 9, 2000

INDEX OF SUPPLEMENTAL EXHIBITS OF

NANCY HELLER HUGHES

DESCRIPTION	EXHIBIT
Report titled "Reproduction Cost New Less Depreciation Study of the Properties of U S WEST Communications Located in the State of Arizona as of December 31, 1999"	NHH-1

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-1051B-99-105 AFFIDAVIT OF NANCY HELLER HUGHES
STATE OF WASHINGTON	)	
COUNTY OF KING	)	
	:	SS

Nancy Heller Hughes, of lawful age being first duly sworn, deposes and states:

1. My name is Nancy Heller Hughes. I am an Executive Consultant of R. W. Beck, Inc., Seattle, Washington.

2. Attached hereto and made a part hereof for all purposes is my supplemental testimony consisting of pages 1 through 6, and one exhibit numbered NHH-1.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Nancy Heller Hughes

Nancy Heller Hughes

SUBSCRIBED AND SWORN to before me this 7th day of June 2000.

JEANETTE M. RUUD
COMMISSION EXPIRES
NOTARY
PUBLIC
JUNE 19, 2001
STATE OF WASHINGTON

Jeanette M. Ruud

Notary Public

My Commission Expires:

June 19, 2001

REPRODUCTION COST NEW LESS DEPRECIATION STUDY

Of the Properties of U S WEST COMMUNICATIONS Located in the State of Arizona

As of December 31, 1999

R·W·BECK

REPRODUCTION COST NEW LESS DEPRECIATION STUDY

Of the Properties of U S WEST COMMUNICATIONS Located in the State of Arizona

As Of December 31, 1999

INTRODUCTION

The Arizona Corporation Commission requires a utility to provide a calculation of its fair value rate base whenever it makes a rate filing. In past rate cases, the Arizona Corporation Commission has determined that the fair value of the plant investment included in rate base shall be equal to the average of the original cost less accrued depreciation (OCLD) and the reproduction cost new less depreciation (RCNLD) of the property in service. RCNLD is defined as the cost of constructing an exact replica of the property at current prices with the same or closely related materials, less accrued depreciation. This report presents the results of our study to estimate the RCNLD of the Arizona plant in service of U S WEST Communications, Inc. (U S WEST) as of December 31, 1999.

The estimated RCNLD was developed using the same procedure, the trended original cost approach, that was used in previous RCNLD studies for U S WEST or its predecessor, Mountain States Telephone and Telegraph Company (Mountain Bell), which were accepted with approval by the Arizona Corporation Commission. Under this approach, the original cost of the property is indexed to current cost using a cost index that represents the change in price levels from the date of investment to the date of valuation. The amount of accumulated depreciation in the RCNLD study is computed based on the life expectancies and mortality characteristics used to calculate U S WEST's depreciation rates for each plant account.

ORIGINAL COST DATA

Original cost data as of December 31, 1999 by vintage for each plant account or sub-account was obtained from U S WEST's Generation Arrangement Data File for Arizona. This data is used to support the depreciation rates prescribed by the

Arizona Corporation Commission. The original cost of the plant investment by year of placement is shown in Column B on the detailed output in Appendix A.

The total original cost as of December 31, 1999 shown in Column B for each account is equal to the plant investment shown on U S WEST's MR2A financial report.

COST INDICES

The original cost of the property as of December 31, 1999 was indexed to current cost using the U S WEST Telephone Price Index (TPI) prepared by Joel Popkin and Company, economic consultants. This index shows the change in cost over time for various types of telephone plant and equipment. A copy of the TPIs used in the study is provided in Appendix B. The TPI for each plant account, by vintage, is also shown in Column C of the detailed output in Appendix B. These TPIs represent the average annual index for each year.

The cost indices in Column C were converted into translators in Column D by dividing the index at the date for which the Replacement Cost New (RCN) is desired, December 31, 1999, by the index for the year of placement. For example, on page 1 of Appendix A, which shows the calculation for motor vehicles – passenger cars, the index at December 31, 1999 is 116.7 while the index for the year 1984 is 92.0. This indicates, for example, that a car which cost $10,000 in 1984 would cost $12,680 on December 31, 1999, or (116.7 divided by 92.0) 1.268 times as much. This 1.268, which is shown in the line of Column D for 1984, is used to "translate" the dollars spent for a passenger car in 1984 into the cost of an equivalent passenger car at prices forecast to be in effect on December 31, 1999.

REPRODUCTION COST NEW

The RCN of the plant investment shown in Column E of the detailed output was calculated by multiplying the original cost of the plant by vintage in Column B, by the corresponding translator in Column E. The average increase in cost for each account (RCN divided by original cost) is shown on the "total" line in Column D.

DEPRECIATION RESERVE

The amount of depreciation reserve to be deducted from the RCN was determined by applying a factor known as the "condition percent." The condition percent is defined as the ratio of the present depreciable value to the depreciable value of the plant when new. Thus, the condition percent when multiplied by the RCN gives the RCN less depreciation (RCNLD), whereupon the dollar amount of the depreciation reserve may be derived, if desired.

Mathematically, the condition percent is defined by the equation (N-X)/N, where N is equal to the probable average service life of the plant and X is equal to the age of the plant. Since by definition the probable average service life is equal to

the age plus the life expectancy, the formula for determining the condition percent can be written as follows:

$$\text{Condition Percent} = \frac{\text{Life Expectancy at Age X}}{\text{Life Expectancy When New}}$$

The use of the condition percent is based on the principle that the value of a piece of property, as affected by all the physical and functional conditions that will ultimately force its retirement from service, depends upon the number of years it can reasonably be expected to give service in the future. To illustrate, if the life expectancy of an existing item of property is estimated to be 15 years but a consistent estimate of its life expectancy if it were new is 20 years, then the remaining service to be expected from the property is 15/20 or 75 percent of the service to be expected from a new item. On this basis, the present condition percent is 75 percent.

The calculation of the condition percent is shown in Columns F through I on the detailed output provided in Appendix A. Column F shows the average age of each plant vintage as of December 31, 1999. In calculating the average age, it was assumed that all plant was placed into service at the middle of the year. Thus, the average age of plant placed in service during 1978, for example, is equal to 21 years (June 30, 1999 minus June 30, 1978). Columns G and H show the estimated life expectancies for each vintage as estimated in the calculation of the prescribed depreciation rates. Column G shows the estimated life expectancy for new plant which is the reference point as new plant is, by definition, in 100 percent condition. Column H shows the estimated life expectancy for each plant vintage given its age as of December 31, 1999. The condition percent in Column I is equal to Column H divided by Column G.

The life expectancies shown in Columns G and H for each plant vintage were determined based on the survivor curves and average service lives approved for U S WEST by the Arizona Corporation Commission in Decision No. 62507 (Docket No. T-01051B-97-0689). A survivor curve shows the percentage of each vintage, or group of plant placed in service during a single year, which is still surviving in service at a given age. U S WEST uses Iowa type survivor curves to describe the mortality characteristics of each plant account. The depreciation parameters used for each plant account are shown in Appendix C.

REPRODUCTION COST NEW LESS DEPRECIATION

The RCNLD value of the property shown in Column J for each account in Appendix A was calculated by applying the condition percent in Column I to the RCN value in Column E. The procedures described in this report were used in the computer model to determine the RCN and RCNLD, by plant account or sub-account, for all Arizona property of U S WEST for which vintage plant data was available. A summary of the output from the computer model is provided in Table 2 to this report.

The RCN value of land (Account 2111) and art works (Account 2122.2) was assumed to be equal to the original plant investment recorded on U S WEST's books as of December 31, 1999. TPIs were not available for these accounts and the nature of this plant does not lend itself to use of a trended cost approach. In addition, because land and art works are not depreciable plant accounts, there is no depreciation reserve. Thus, the RCNLD for land and art works is equal to the original cost of the plant.

Effective January 1, 1998, the Federal Communications Commission (FCC) raised the expense limit from $500 to $1,000 for certain items of furniture and equipment required to be capitalized under the Uniform System of Accounts. The FCC also required companies to amortize the embedded net investment in this plant over a five-year period. In response to the FCC's order, U S WEST reclassified the net investment for embedded furniture, tools, and equipment into separate sub-accounts. The RCN values for these embedded plant accounts were estimated based on the average telephone plant translator for plant installed prior to 1998 in the related primary accounts. The condition percent used to calculate the RCNLD for the embedded plant accounts is based on the book investment and reserve for these accounts as of December 31, 1999. The calculation of the RCN and RCNLD for embedded plant is shown in Table 3 to this report.

The RCNLD of nonregulated plant was assumed to be equal to the original cost less depreciation (i.e., net investment) recorded on U S WEST's books as of December 31, 1999. Because the vintage of plant in the nonregulated accounts is relatively new, it is reasonable to assume that the RCNLD and OCLD values would be comparable. The RCN and RCNLD values for nonregulated plant are shown in Table 4 to this report.

ASSUMPTIONS AND LIMITING CONDITIONS

This study was prepared at the request and for the use of U S WEST, and the conclusions, observations, and opinions contained herein constitute only the opinion of R. W. Beck. To the extent that information provided by U S WEST or prepared by others has been used in the preparation of this report, we have relied upon the same to be accurate, and for which no assurances are intended and no representations or warranties are made. The information was deemed reasonable for the purposes of this report.

The conclusions and opinions found in this report are made expressly to the following conditions and stipulations:

1. The vintage data contained in the Generation Arrangement Data File for Arizona as of December 31, 1999 prepared by U S WEST is assumed to be an accurate and acceptable estimate of the age distribution of the plant in service.
2. The U S WEST Telephone Plant Index prepared by Joel Popkin and Company, economic consultants, is assumed to be an accurate and reasonable indicator of the change in cost over time for various types of telephone plant and equipment.
3. The depreciation parameters that define the survivor curves used by U S WEST to determine its depreciation rates, which were approved by the Arizona Corporation Commission in Decision No. 62507, are assumed to be accurate and acceptable.

OPINION OF VALUE

The total estimated RCN and RCNLD value of the Arizona plant in service of U S WEST as of December 31, 1999 is shown in the table below. This estimate is based on the limiting conditions and assumptions described in this report. A detailed summary of the RCN and RCNLD values by plant account is provided in Table 1.

	Value as of December 31, 1999
Reproduction Cost New	$6,361,585,948
Reproduction Cost New Less Depreciation	$3,558,480,937
Condition Percent	56%

We appreciate the opportunity to perform this valuation study for U S WEST Communications, Inc.

Respectfully submitted,

R. W. BECK, INC.

Nancy Heller Hughes

Nancy Heller Hughes, ASA
Executive Consultant

June 7, 2000

Table 1

US WEST COMMUNICATIONS, INC.

REPRODUCTION COST NEW LESS DEPRECIATION
TELEPHONE PLANT IN SERVICE

As of December 31, 1999

	Original Cost	Reproduction Cost New	Depreciation	Reproduction Cost New Less Depreciation
Vintage Plant (1)	$4,890,129,675	$6,257,477,341	$2,769,795,340	$3,487,682,001
Land	10,221,552	10,221,552	0	10,221,552
Artwork	207,237	207,237	0	207,237
Embedded Plant (2)				
COE Accounts	0	0	0	0
Other Plant Accounts	22,074,120	16,276,086	8,464,245	7,811,841
Subtotal Embedded Plant	22,074,120	16,276,086	8,464,245	7,811,841
Unregulated and Other Plant (3)	77,403,732	77,403,732	24,845,426	52,558,306
Total Arizona Plant	$5,000,036,315	$6,361,585,948	$2,803,105,011	$3,558,480,937

(1) See Table 2
(2) See Table 3
(3) See Table 4

Table 2

US WEST COMMUNICATIONS, INC.

REPRODUCTION COST NEW LESS DEPRECIATION
VINTAGE PLANT

As of December 31, 1999

Account	Description	Original Cost 12/31/1999	Telephone Plant Translator	Reproduction Cost New	Condition Percent	Reproduction Cost New Less Depreciation
2112	Motor Vehicles	$67,008,716	1.079	$72,326,913	47.3%	$34,195,821
2114	Special Purpose Vehicles	25,794	1.219	31,447	47.3%	14,863
2115	Garage Work Equip	1,356,323	1.239	1,680,681	69.9%	1,174,744
2116	Other Work Equip	22,416,411	1.168	26,177,888	49.3%	12,898,281
2121	Buildings	162,763,559	2.059	335,131,472	64.3%	215,612,756
2122	Furniture	1,703,616	1.122	1,910,709	71.8%	1,371,520
2123	Company Comm Equip	6,944,455	0.957	6,646,073	49.9%	3,314,492
2124	Gen Purpose Computer	112,016,697	0.469	52,564,359	63.7%	33,473,069
2211	Analog SW Equip	138,599,056	1.206	167,207,907	80.9%	135,305,249
2212	Digital SW Equip	819,225,291	0.987	808,935,651	71.6%	578,904,730
2220	Operator Systems	7,080,061	1.021	7,228,640	54.9%	3,966,734
2231	Radio Systems	35,323,150	1.016	35,891,456	43.1%	15,470,156
2232	Circuit Equip	1,185,447,017	0.993	1,177,608,648	75.9%	893,501,712
2362	Other Term Equip	48,461,067	1.061	51,412,073	89.0%	45,731,434
2411	Pole Lines	46,616,809	4.341	202,360,271	61.0%	123,344,870
2421	Aerial Cable	170,704,495	1.723	294,160,265	30.4%	89,325,434
2422	Underground Cable	435,295,207	1.218	530,303,739	31.4%	166,582,300
2423	Buried Cable	1,273,669,392	1.352	1,722,089,520	45.3%	780,789,561
2424	Sub Cable	2,572	1.256	3,232	0.0%	0
2426	Intra Bldg Cable	41,603,544	1.825	75,914,620	33.2%	25,234,818
2431	Aerial Wire	8,798,956	1.346	11,843,641	55.6%	6,590,530
2441	Conduit Systems	305,067,487	2.216	676,048,139	47.5%	320,878,928
	Total Vintage Plant	$4,890,129,675		$6,257,477,341		$3,487,682,001

Table 3

US WEST COMMUNICATIONS, INC.

REPRODUCTION COST NEW LESS DEPRECIATION
EMBEDDED PLANT

As of December 31, 1999

Account	Sub Code	Description	Original Cost 6/30/1998	Telephone Plant Translator	Reproduction Cost New	Condition Percent	Reproduction Cost New Less Depreciation
2115	1264c	Garage Work Equipment	37,512	1.257	47,151	100.00%	47,151
2116	1564c	Other Work Equipment	4,740,516	1.205	5,712,893	86.42%	4,937,094
2122	2161c	Furniture	467,604	1.210	565,895	70.89%	401,167
2123.1	2261c	Office Equipment	675,540	1.021	689,435	46.38%	319,753
2123.2	124c, 114c	Comp Comm Equip	9,419,400	0.723	6,806,585	22.25%	1,514,488
2124	1361c	General Purpose Computers	6,733,548	0.364	2,454,127	24.13%	592,188
		Total Embedded Plant	$22,074,120	0.737	$16,276,086	48.00%	$7,811,841

Table 4

US WEST COMMUNICATIONS, INC.

REPRODUCTION COST NEW LESS DEPRECIATION
NONREGULATED AND OTHER ACCOUNTS

As of December 31, 1999

Account	Sub Codes	Description	Original Cost 6/30/1998	Telephone Plant Translator	Reproduction Cost New	Condition Percent	Reproduction Cost New Less Depreciation
2112	9464c	Motor Vehicles	$1,547,495	1.000	$1,547,495	79.02%	$1,222,885
2124	6361c	General Purpose Computers	6,821	1.000	6,821	90.75%	6,190
2212	5377c, 6377c, 9007c, 9277c, 9577c	Digital Electronic Switching	19,764,232	1.000	19,764,232	51.97%	10,270,807
2231	367c	Radio Systems	216,210	1.000	216,210	83.33%	180,175
2232	6257c, 9057c	Circuit Equipment	12,391,098	1.000	12,391,098	86.05%	10,662,581
2311	6048c, 9128c	Station Apparatus	25,501,769	1.000	25,501,769	89.96%	22,942,052
2351	9188c, 9288c, 9488c, 9688c, 9788c, 9988c	Public Tel. Term. Equip.	17,969,238	1.000	17,969,238	40.44%	7,266,747
2422	685c	Underground Cable	3,752	1.000	3,752	100.00%	3,752
2423	645c, 6845c	Buried Cable	3,117	1.000	3,117	100.00%	3,117
		Total Nonregulated Plant	$77,403,732		$77,403,732	67.90%	$52,558,306

Appendix A

DETAILED OUTPUT BY PLANT ACCOUNT

R·W·BECK

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Motor Vehicles
Plant Sub-Account:	Passenger Cars
Index Number:	2112
Field Code:	MVA
Survivor Curve:	L3
Average Service Life:	8.6

Year of Placing	Original Cost as of 12/31/1999	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 12/31/1999	Life Expectancy When New	Life Expectancy 12/31/1999	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1984	34,255	92.0	1.268	43,449	15.00	8.60	1.12	13.02%	5,657
1985	9,585	94.0	1.241	11,894	14.00	8.60	1.34	15.58%	1,853
1986	72,649	96.5	1.210	87,879	13.00	8.60	1.59	18.49%	16,249
1987	243,615	98.8	1.182	287,862	12.00	8.60	1.84	21.40%	61,602
1988	689,909	100.0	1.167	805,124	11.00	8.60	2.10	24.42%	196,611
1989	682,880	102.7	1.136	775,661	10.00	8.60	2.34	27.21%	211,057
1990	334,394	104.5	1.117	373,400	9.00	8.60	2.51	29.19%	108,995
1991	229,918	108.0	1.081	248,537	8.00	8.60	2.69	31.28%	77,742
1992	17,077	110.4	1.057	18,046	7.00	8.60	2.95	34.30%	6,190
1993	0	113.2	1.031	0	6.00	8.60	3.35	38.95%	0
1994	0	116.2	1.004	0	5.00	8.60	3.99	46.40%	0
1995	0	117.6	0.992	0	4.00	8.60	4.74	55.12%	0
1996	0	118.6	0.984	0	3.00	8.60	5.65	65.70%	0
1997	0	117.3	0.995	0	2.00	8.60	6.63	77.09%	0
1998	0	116.2	1.004	0	1.00	8.60	7.57	88.02%	0
1999	0	116.7	1.000	0	0.00	8.60	8.60	100.00%	0
	2,314,282		1.146	2,651,851				25.87%	685,957

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Motor Vehicles
Plant Sub-Account: Light Trucks
Index Number: 2112
Field Code: MVB
Survivor Curve: L3
Average Service Life: 8.6

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1980	10,441	73.4	1.590	16,600	19.00	8.60	0.30	3.49%	579
1981	0	83.6	1.396	0	18.00	8.60	0.50	5.81%	0
1982	20,244	88.4	1.320	26,725	17.00	8.60	0.68	7.91%	2,114
1983	148,606	90.4	1.291	191,840	16.00	8.60	0.90	10.47%	20,086
1984	1,787,285	92.0	1.268	2,267,132	15.00	8.60	1.12	13.02%	295,181
1985	49,118	94.0	1.241	60,979	14.00	8.60	1.34	15.58%	9,501
1986	97,499	96.5	1.209	117,908	13.00	8.60	1.59	18.49%	21,801
1987	649,079	98.8	1.181	766,675	12.00	8.60	1.84	21.40%	164,069
1988	4,122,139	100.0	1.167	4,810,536	11.00	8.60	2.10	24.42%	1,174,733
1989	6,012,363	102.7	1.136	6,831,965	10.00	8.60	2.34	27.21%	1,858,978
1990	4,585,754	104.5	1.117	5,121,124	9.00	8.60	2.51	29.19%	1,494,856
1991	5,781,578	108.0	1.081	6,247,316	8.00	8.60	2.69	31.28%	1,954,161
1992	4,383,380	110.4	1.057	4,633,519	7.00	8.60	2.95	34.30%	1,589,297
1993	4,462,088	113.2	1.031	4,600,050	6.00	8.60	3.35	38.95%	1,791,720
1994	2,281,980	116.2	1.004	2,291,799	5.00	8.60	3.99	46.40%	1,063,395
1995	281,045	117.6	0.992	278,894	4.00	8.60	4.74	55.12%	153,726
1996	5,438,004	118.6	0.984	5,350,886	3.00	8.60	5.65	65.70%	3,515,532
1997	3,289,100	117.3	0.995	3,272,276	2.00	8.60	6.63	77.09%	2,522,598
1998	4,283,235	116.2	1.004	4,301,665	1.00	8.60	7.57	88.02%	3,786,326
1999	10,820,302	116.7	1.000	10,820,302	0.00	8.60	8.60	100.00%	10,820,302
	58,503,240		1.060	62,008,193				51.99%	32,238,952

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Motor Vehicles
Plant Sub-Account: Heavy Trucks
Index Number: 2112
Field Code: MVC
Survivor Curve: L3
Average Service Life: 8.6

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1980	167,307	73.4	1.590	266,004	19.00	8.60	0.30	3.49%	9,284
1981	768,571	83.6	1.396	1,072,874	18.00	8.60	0.50	5.81%	62,334
1982	710,235	88.4	1.320	937,607	17.00	8.60	0.68	7.91%	74,165
1983	1,275,965	90.4	1.291	1,647,180	16.00	8.60	0.90	10.47%	172,460
1984	1,054,158	92.0	1.268	1,337,177	15.00	8.60	1.12	13.02%	174,100
1985	211,991	94.0	1.241	263,185	14.00	8.60	1.34	15.58%	41,004
1986	0	96.5	1.209	0	13.00	8.60	1.59	18.49%	0
1987	125,275	98.8	1.181	147,972	12.00	8.60	1.84	21.40%	31,666
1988	115,878	100.0	1.167	135,230	11.00	8.60	2.10	24.42%	33,023
1989	39,621	102.7	1.136	45,022	10.00	8.60	2.34	27.21%	12,251
1990	350,956	104.5	1.117	391,929	9.00	8.60	2.51	29.19%	114,404
1991	157,139	108.0	1.081	169,797	8.00	8.60	2.69	31.28%	53,113
1992	186,537	110.4	1.057	197,182	7.00	8.60	2.95	34.30%	67,633
1993	894,132	113.2	1.031	921,777	6.00	8.60	3.35	38.95%	359,032
1994	118,627	116.2	1.004	119,137	5.00	8.60	3.99	46.40%	55,280
1995	5,702	117.6	0.992	5,658	4.00	8.60	4.74	55.12%	3,119
1996	0	118.6	0.984	0	3.00	8.60	5.65	65.70%	0
1997	0	117.3	0.995	0	2.00	8.60	6.63	77.09%	0
1998	9,100	116.2	1.004	9,139	1.00	8.60	7.57	88.02%	8,044
1999	0	116.7	1.000	0	0.00	8.60	8.60	100.00%	0
	6,191,194		1.238	7,666,870				16.58%	1,270,911

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Special Purpose Vehicles
Plant Sub-Account:	Special Purpose Vehicles
Index Number:	2114
Field Code:	SPZ
Survivor Curve:	S6
Average Service Life:	16.1

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1975	8	48.2	2.863	23	24.00	16.10	0.00	0.00%	0
1976	14	51.7	2.669	37	23.00	16.10	0.00	0.00%	0
1977	55	55.6	2.482	137	22.00	16.10	0.08	0.50%	1
1978	193	60.5	2.281	440	21.00	16.10	0.23	1.43%	6
1979	258	66.5	2.075	535	20.00	16.10	0.30	1.86%	10
1980	330	75.2	1.835	606	19.00	16.10	0.38	2.36%	14
1981	642	83.4	1.655	1,062	18.00	16.10	0.51	3.17%	34
1982	609	89.4	1.544	940	17.00	16.10	0.69	4.29%	40
1983	1,062	91.5	1.508	1,602	16.00	16.10	1.03	6.40%	103
1984	1,191	92.8	1.487	1,771	15.00	16.10	1.51	9.38%	166
1985	697	94.6	1.459	1,017	14.00	16.10	2.21	13.73%	140
1986	361	95.4	1.447	522	13.00	16.10	3.08	19.13%	100
1987	297	97.4	1.417	421	12.00	16.10	4.03	25.03%	105
1988	830	100.0	1.380	1,145	11.00	16.10	5.15	31.99%	366
1989	1,704	105.7	1.306	2,225	10.00	16.10	6.12	38.01%	846
1990	61	112.1	1.231	75	9.00	16.10	7.08	43.98%	33
1991	512	118.0	1.169	599	8.00	16.10	8.05	50.00%	299
1992	162	122.4	1.127	183	7.00	16.10	9.18	57.02%	104
1993	0	124.7	1.107	0	6.00	16.10	10.14	62.98%	0
1994	16,808	128.1	1.077	18,107	5.00	16.10	11.11	69.01%	12,496
1995	0	132.0	1.045	0	4.00	16.10	12.08	75.03%	0
1996	0	135.1	1.021	0	3.00	16.10	13.04	80.99%	0
1997	0	136.5	1.011	0	2.00	16.10	14.17	88.01%	0
1998	0	138.1	0.999	0	1.00	16.10	15.13	93.98%	0
1999	0	138.0	1.000	0	0.00	16.10	16.10	100.00%	0
	25,794		1.219	31,447				47.26%	14,863

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Garage Work Equipment
Plant Sub-Account: Garage Work Equipment
Index Number: 2115
Field Code: GWZ
Survivor Curve: L0
Average Service Life: 13.7

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1975	213	48.2	2.863	610	24.00	13.70	5.29	38.61%	235
1976	455	51.7	2.669	1,215	23.00	13.70	5.50	40.15%	488
1977	1,991	55.6	2.482	4,942	22.00	13.70	5.71	41.68%	2,060
1978	8,274	60.5	2.281	18,873	21.00	13.70	5.96	43.50%	8,210
1979	12,554	66.5	2.075	26,052	20.00	13.70	6.19	45.18%	11,770
1980	17,913	75.2	1.835	32,872	19.00	13.70	6.42	46.86%	15,404
1981	38,218	83.4	1.655	63,238	18.00	13.70	6.70	48.91%	30,930
1982	39,105	89.4	1.544	60,363	17.00	13.70	6.95	50.73%	30,622
1983	72,807	91.5	1.508	109,807	16.00	13.70	7.21	52.63%	57,792
1984	86,174	92.8	1.487	128,147	15.00	13.70	7.51	54.82%	70,250
1985	52,754	94.6	1.459	76,956	14.00	13.70	7.79	56.86%	43,757
1986	28,365	95.4	1.447	41,031	13.00	13.70	8.07	58.91%	24,171
1987	24,091	97.4	1.417	34,133	12.00	13.70	8.37	61.09%	20,852
1988	69,246	100.0	1.380	95,559	11.00	13.70	8.72	63.65%	60,824
1989	145,582	105.7	1.306	190,069	10.00	13.70	9.04	65.99%	125,427
1990	5,278	112.1	1.231	6,497	9.00	13.70	9.37	68.39%	4,444
1991	45,296	118.0	1.169	52,973	8.00	13.70	9.76	71.24%	37,738
1992	11,612	122.4	1.127	13,092	7.00	13.70	10.12	73.87%	9,671
1993	46,705	124.7	1.107	51,686	6.00	13.70	10.49	76.57%	39,576
1994	166,895	128.1	1.077	179,793	5.00	13.70	10.93	79.78%	143,439
1995	127,154	132.0	1.045	132,934	4.00	13.70	11.35	82.85%	110,136
1996	127,561	135.1	1.021	130,299	3.00	13.70	11.81	86.20%	112,318
1997	134,101	136.5	1.011	135,575	2.00	13.70	12.31	89.85%	121,814
1998	21,800	138.1	0.999	21,784	1.00	13.70	12.98	94.74%	20,638
1999	72,179	138.0	1.000	72,179	0.00	13.70	13.70	100.00%	72,179
	1,356,323		1.239	1,680,681				69.90%	1,174,744

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Other Work Equipment
Plant Sub-Account: Other Work Equipment
Index Number: 2116
Field Code: OWZ
Survivor Curve: L4
Average Service Life: 11.5

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1963	10	23.1	5.662	57	36.00	11.50	0.00	0.00%	0
1964	52	23.7	5.519	287	35.00	11.50	0.00	0.00%	0
1965	155	24.3	5.383	834	34.00	11.50	0.00	0.00%	0
1966	245	25.1	5.211	1,277	33.00	11.50	0.00	0.00%	0
1967	1,060	26.0	5.031	5,333	32.00	11.50	0.00	0.00%	0
1968	1,160	27.5	4.756	5,517	31.00	11.50	0.00	0.00%	0
1969	4,262	28.7	4.557	19,424	30.00	11.50	0.00	0.00%	0
1970	11,085	30.0	4.360	48,331	29.00	11.50	0.00	0.00%	0
1971	7,388	31.6	4.139	30,581	28.00	11.50	0.00	0.00%	0
1972	13,753	32.7	4.000	55,012	27.00	11.50	0.00	0.00%	0
1973	14,919	34.0	3.847	57,394	26.00	11.50	0.00	0.00%	0
1974	25,885	39.6	3.303	85,499	25.00	11.50	0.00	0.00%	0
1975	18,224	48.2	2.714	49,454	24.00	11.50	0.23	2.00%	989
1976	18,069	51.7	2.530	45,714	23.00	11.50	0.36	3.13%	1,431
1977	37,807	55.6	2.353	88,942	22.00	11.50	0.49	4.26%	3,789
1978	94,521	60.5	2.162	204,353	21.00	11.50	0.60	5.22%	10,667
1979	96,869	66.5	1.967	190,533	20.00	11.50	0.74	6.43%	12,251
1980	115,658	75.2	1.739	201,171	19.00	11.50	0.90	7.83%	15,752
1981	220,977	83.4	1.568	346,568	18.00	11.50	1.05	9.13%	31,642
1982	231,732	89.4	1.463	339,044	17.00	11.50	1.23	10.70%	36,278
1983	460,273	91.5	1.430	657,964	16.00	11.50	1.43	12.43%	81,785
1984	597,312	92.8	1.409	841,901	15.00	11.50	1.65	14.35%	120,813
1985	402,706	94.6	1.383	556,807	14.00	11.50	1.85	16.09%	89,590
1986	236,602	95.4	1.371	324,398	13.00	11.50	2.05	17.83%	57,840
1987	684,041	97.4	1.343	918,609	12.00	11.50	2.19	19.04%	174,903
1988	1,350,624	100.0	1.308	1,766,616	11.00	11.50	2.35	20.43%	360,920
1989	1,218,993	104.8	1.248	1,521,415	10.00	11.50	2.68	23.30%	354,490
1990	863,283	108.8	1.202	1,037,844	9.00	11.50	3.23	28.09%	291,530
1991	1,324,054	112.0	1.168	1,546,306	8.00	11.50	3.88	33.74%	521,724
1992	3,017,109	115.1	1.136	3,428,652	7.00	11.50	4.71	40.96%	1,404,376
1993	1,107,763	118.1	1.108	1,226,887	6.00	11.50	5.61	48.78%	598,476
1994	1,617,552	119.6	1.094	1,769,028	5.00	11.50	6.58	57.22%	1,012,238
1995	553,437	122.3	1.070	591,902	4.00	11.50	7.48	65.04%	384,973
1996	1,707,641	125.0	1.046	1,786,876	3.00	11.50	8.51	74.00%	1,322,288
1997	2,273,826	127.2	1.028	2,338,180	2.00	11.50	9.55	83.04%	1,941,624
1998	235,521	129.8	1.008	237,335	1.00	11.50	10.47	91.04%	216,070
1999	3,851,843	130.8	1.000	3,851,843	0.00	11.50	11.50	100.00%	3,851,843
	22,416,411		1.168	26,177,888				49.27%	12,898,281

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Buildings
Plant Sub-Account: Large Buildings
Index Number: 2121
Field Code: BUA
Survivor Curve: R1
Average Service Life: 43

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1925	25,540	11.9	10.880	277,865	74.00	43.00	3.98	9.26%	25,730
1926	0	11.9	10.880	0	73.00	43.00	4.24	9.86%	0
1927	0	11.9	10.880	0	72.00	43.00	4.63	10.77%	0
1928	49,465	11.9	10.880	538,160	71.00	43.00	4.89	11.37%	61,189
1929	0	11.9	10.880	0	70.00	43.00	5.16	12.00%	0
1930	9,600	11.9	10.880	104,444	69.00	43.00	5.57	12.95%	13,526
1931	0	11.9	10.880	0	68.00	43.00	5.84	13.58%	0
1932	1,084	11.9	10.880	11,793	67.00	43.00	6.12	14.23%	1,678
1933	0	11.9	10.880	0	66.00	43.00	6.55	15.23%	0
1934	0	11.9	10.880	0	65.00	43.00	6.84	15.91%	0
1935	0	11.9	10.880	0	64.00	43.00	7.13	16.58%	0
1936	0	11.9	10.880	0	63.00	43.00	7.43	17.28%	0
1937	0	11.9	10.880	0	62.00	43.00	7.89	18.35%	0
1938	4,200	11.9	10.880	45,694	61.00	43.00	8.19	19.05%	8,705
1939	0	11.9	10.880	0	60.00	43.00	8.51	19.79%	0
1940	0	11.9	10.880	0	59.00	43.00	8.99	20.91%	0
1941	0	11.9	10.880	0	58.00	43.00	9.31	21.65%	0
1942	739	11.9	10.880	8,040	57.00	43.00	9.64	22.42%	1,803
1943	3,148	11.9	10.880	34,249	56.00	43.00	10.14	23.58%	8,076
1944	0	11.9	10.880	0	55.00	43.00	10.48	24.37%	0
1945	0	11.9	10.880	0	54.00	43.00	10.83	25.19%	0
1946	0	11.9	10.880	0	53.00	43.00	11.35	26.40%	0
1947	92,249	13.6	9.578	883,540	52.00	43.00	11.71	27.23%	240,588
1948	286,594	14.8	8.755	2,509,041	51.00	43.00	12.07	28.07%	704,288
1949	564,972	15.4	8.457	4,778,171	50.00	43.00	12.63	29.37%	1,403,349
1950	58,142	15.5	8.363	486,223	49.00	43.00	13.01	30.26%	147,131
1951	170,514	16.5	7.892	1,345,620	48.00	43.00	13.39	31.14%	419,026
1952	266,690	17.1	7.597	2,026,121	47.00	43.00	13.97	32.49%	658,287
1953	293,536	17.6	7.397	2,171,198	46.00	43.00	14.36	33.40%	725,180
1954	173,825	18.0	7.206	1,252,658	45.00	43.00	14.76	34.33%	430,037
1955	382,229	18.6	7.004	2,677,036	44.00	43.00	15.38	35.77%	957,576
1956	455,020	19.7	6.611	3,008,233	43.00	43.00	15.79	36.72%	1,104,623
1957	1,015,867	20.2	6.440	6,542,417	42.00	43.00	16.21	37.70%	2,466,491
1958	427,224	20.7	6.278	2,682,057	41.00	43.00	16.86	39.21%	1,051,635
1959	698,206	21.1	6.174	4,310,797	40.00	43.00	17.29	40.21%	1,733,371
1960	1,799,852	21.2	6.123	11,021,389	39.00	43.00	17.73	41.23%	4,544,119
1961	1,680,305	21.3	6.107	10,261,307	38.00	43.00	18.41	42.81%	4,392,865
1962	241,540	21.5	6.041	1,459,136	37.00	43.00	18.86	43.86%	639,977
1963	739,092	22.0	5.898	4,359,087	36.00	43.00	19.33	44.95%	1,959,410
1964	913,445	22.7	5.732	5,235,839	35.00	43.00	20.03	46.58%	2,438,854
1965	172,505	23.4	5.561	959,350	34.00	43.00	20.51	47.70%	457,610
1966	267,795	24.3	5.349	1,432,416	33.00	43.00	20.99	48.81%	699,162
1967	409,895	25.5	5.105	2,092,612	32.00	43.00	21.73	50.53%	1,057,397
1968	764,279	26.8	4.851	3,707,580	31.00	43.00	22.23	51.70%	1,916,819

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Buildings
Plant Sub-Account:	Large Buildings
Index Number:	2121
Field Code:	BUA
Survivor Curve:	R1
Average Service Life:	43

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1969	772,512	28.5	4.555	3,519,012	30.00	43.00	22.73	52.86%	1,860,150
1970	1,827,916	31.1	4.181	7,643,144	29.00	43.00	23.50	54.65%	4,176,978
1971	2,850,678	33.8	3.844	10,958,730	28.00	43.00	24.02	55.86%	6,121,547
1972	4,400,876	36.7	3.541	15,581,743	27.00	43.00	24.54	57.07%	8,892,501
1973	5,358,582	39.4	3.296	17,661,256	26.00	43.00	25.34	58.93%	10,407,778
1974	1,432,712	45.1	2.881	4,127,242	25.00	43.00	25.87	60.16%	2,482,949
1975	1,731,721	50.9	2.553	4,420,425	24.00	43.00	26.41	61.42%	2,715,025
1976	265,869	54.2	2.397	637,289	23.00	43.00	27.23	63.33%	403,595
1977	1,601,227	58.0	2.241	3,588,670	22.00	43.00	27.79	64.63%	2,319,357
1978	1,175,586	62.8	2.071	2,435,049	21.00	43.00	28.34	65.91%	1,604,941
1979	2,877,870	67.7	1.919	5,522,159	20.00	43.00	28.91	67.23%	3,712,548
1980	2,053,406	74.3	1.750	3,592,579	19.00	43.00	29.76	69.21%	2,486,424
1981	3,955,108	81.3	1.600	6,327,044	18.00	43.00	30.33	70.53%	4,462,464
1982	5,472,397	87.3	1.489	8,149,326	17.00	43.00	30.90	71.86%	5,856,106
1983	1,685,106	90.1	1.443	2,431,848	16.00	43.00	31.77	73.88%	1,796,649
1984	3,590,741	91.2	1.426	5,119,319	15.00	43.00	32.35	75.23%	3,851,263
1985	11,751,297	92.6	1.405	16,506,079	14.00	43.00	32.93	76.58%	12,640,355
1986	4,559,977	96.1	1.353	6,171,389	13.00	43.00	33.81	78.63%	4,852,563
1987	2,691,571	97.4	1.335	3,592,822	12.00	43.00	34.40	80.00%	2,874,258
1988	6,165,657	100.0	1.300	8,015,354	11.00	43.00	35.00	81.40%	6,524,498
1989	5,181,373	100.5	1.294	6,704,673	10.00	43.00	35.89	83.47%	5,596,390
1990	4,108,193	102.9	1.263	5,190,125	9.00	43.00	36.49	84.86%	4,404,340
1991	3,782,035	105.6	1.231	4,654,748	8.00	43.00	37.10	86.28%	4,016,117
1992	5,221,571	108.9	1.194	6,233,280	7.00	43.00	38.01	88.40%	5,510,220
1993	1,967,751	116.8	1.113	2,190,134	6.00	43.00	38.62	89.81%	1,966,959
1994	2,288,433	117.8	1.104	2,525,435	5.00	43.00	39.23	91.23%	2,303,955
1995	6,093,261	123.2	1.055	6,429,577	4.00	43.00	40.16	93.40%	6,005,225
1996	4,272,639	127.0	1.024	4,373,567	3.00	43.00	40.79	94.86%	4,148,766
1997	2,809,931	127.7	1.018	2,860,541	2.00	43.00	41.41	96.30%	2,754,701
1998	1,610,162	128.4	1.012	1,630,226	1.00	43.00	42.36	98.51%	1,605,936
1999	4,667,411	130.0	1.000	4,667,411	0.00	43.00	43.00	100.00%	4,667,411
	120,191,121		2.161	259,682,271				62.88%	163,290,470

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Buildings
Plant Sub-Account: Other Buildings
Index Number: 2121
Field Code: BUB
Survivor Curve: R1
Average Service Life: 43

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1926	2,619	11.9	10.880	28,494	73.00	43.00	4.24	9.86%	2,809
1927	6,423	11.9	10.880	69,880	72.00	43.00	4.63	10.77%	7,526
1928	2,702	11.9	10.880	29,397	71.00	43.00	4.89	11.37%	3,342
1929	2,496	11.9	10.880	27,156	70.00	43.00	5.16	12.00%	3,259
1930	0	11.9	10.880	0	69.00	43.00	5.57	12.95%	0
1931	0	11.9	10.880	0	68.00	43.00	5.84	13.58%	0
1932	0	11.9	10.880	0	67.00	43.00	6.12	14.23%	0
1933	0	11.9	10.880	0	66.00	43.00	6.55	15.23%	0
1934	0	11.9	10.880	0	65.00	43.00	6.84	15.91%	0
1935	0	11.9	10.880	0	64.00	43.00	7.13	16.58%	0
1936	5,691	11.9	10.880	61,916	63.00	43.00	7.43	17.28%	10,699
1937	0	11.9	10.880	0	62.00	43.00	7.89	18.35%	0
1938	2,791	11.9	10.880	30,365	61.00	43.00	8.19	19.05%	5,785
1939	0	11.9	10.880	0	60.00	43.00	8.51	19.79%	0
1940	1,077	11.9	10.880	11,717	59.00	43.00	8.99	20.91%	2,450
1941	0	11.9	10.880	0	58.00	43.00	9.31	21.65%	0
1942	4,668	11.9	10.880	50,786	57.00	43.00	9.64	22.42%	11,386
1943	0	11.9	10.880	0	56.00	43.00	10.14	23.58%	0
1944	7,532	11.9	10.880	81,945	55.00	43.00	10.48	24.37%	19,970
1945	0	11.9	10.880	0	54.00	43.00	10.83	25.19%	0
1946	3,399	11.9	10.880	36,980	53.00	43.00	11.35	26.40%	9,763
1947	0	13.6	9.578	0	52.00	43.00	11.71	27.23%	0
1948	0	14.8	8.755	0	51.00	43.00	12.07	28.07%	0
1949	55,377	15.4	8.457	468,343	50.00	43.00	12.63	29.37%	137,552
1950	16,323	15.5	8.363	136,504	49.00	43.00	13.01	30.26%	41,306
1951	3,975	16.5	7.892	31,369	48.00	43.00	13.39	31.14%	9,768
1952	7,508	17.1	7.597	57,040	47.00	43.00	13.97	32.49%	18,532
1953	6,133	17.6	7.397	45,364	46.00	43.00	14.36	33.40%	15,152
1954	80,437	18.0	7.206	579,664	45.00	43.00	14.76	34.33%	198,999
1955	95,499	18.6	7.004	668,851	44.00	43.00	15.38	35.77%	239,248
1956	55,188	19.7	6.611	364,859	43.00	43.00	15.79	36.72%	133,976
1957	107,435	20.2	6.440	691,906	42.00	43.00	16.21	37.70%	260,849
1958	132,113	20.7	6.278	829,388	41.00	43.00	16.86	39.21%	325,203
1959	32,239	21.1	6.174	199,047	40.00	43.00	17.29	40.21%	80,037
1960	362,119	21.2	6.123	2,217,435	39.00	43.00	17.73	41.23%	914,248
1961	428,964	21.3	6.107	2,619,602	38.00	43.00	18.41	42.81%	1,121,452
1962	191,787	21.5	6.041	1,158,580	37.00	43.00	18.86	43.86%	508,153
1963	152,363	22.0	5.898	898,621	36.00	43.00	19.33	44.95%	403,930
1964	88,272	22.7	5.732	505,972	35.00	43.00	20.03	46.58%	235,682
1965	62,843	23.4	5.561	349,488	34.00	43.00	20.51	47.70%	166,706
1966	81,735	24.3	5.349	437,194	33.00	43.00	20.99	48.81%	213,395
1967	58,179	25.5	5.105	297,018	32.00	43.00	21.73	50.53%	150,083
1968	146,007	26.8	4.851	708,292	31.00	43.00	22.23	51.70%	366,187
1969	178,069	28.5	4.555	811,155	30.00	43.00	22.73	52.86%	428,777

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Buildings
Plant Sub-Account: Other Buildings
Index Number: 2121
Field Code: BUB
Survivor Curve: R1
Average Service Life: 43

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1970	370,876	31.1	4.181	1,550,760	29.00	43.00	23.50	54.65%	847,490
1971	338,118	33.8	3.844	1,299,811	28.00	43.00	24.02	55.86%	726,075
1972	565,710	36.7	3.541	2,002,953	27.00	43.00	24.54	57.07%	1,143,085
1973	871,098	39.4	3.296	2,871,037	26.00	43.00	25.34	58.93%	1,691,902
1974	624,065	45.1	2.881	1,797,756	25.00	43.00	25.87	60.16%	1,081,530
1975	1,167,463	50.9	2.553	2,980,089	24.00	43.00	26.41	61.42%	1,830,371
1976	335,886	54.2	2.397	805,121	23.00	43.00	27.23	63.33%	509,883
1977	336,288	58.0	2.241	753,689	22.00	43.00	27.79	64.63%	487,109
1978	554,991	62.8	2.071	1,149,580	21.00	43.00	28.34	65.91%	757,688
1979	771,625	67.7	1.919	1,480,622	20.00	43.00	28.91	67.23%	995,422
1980	372,571	74.3	1.750	651,839	19.00	43.00	29.76	69.21%	451,138
1981	927,481	81.3	1.600	1,483,705	18.00	43.00	30.33	70.53%	1,046,457
1982	1,141,924	87.3	1.489	1,700,518	17.00	43.00	30.90	71.86%	1,221,992
1983	2,013,400	90.1	1.443	2,905,623	16.00	43.00	31.77	73.88%	2,146,674
1984	868,827	91.2	1.426	1,238,686	15.00	43.00	32.35	75.23%	931,864
1985	3,875,584	92.6	1.405	5,443,714	14.00	43.00	32.93	76.58%	4,168,796
1986	3,637,460	96.1	1.353	4,922,872	13.00	43.00	33.81	78.63%	3,870,854
1987	3,510,579	97.4	1.335	4,686,069	12.00	43.00	34.40	80.00%	3,748,855
1988	3,967,836	100.0	1.300	5,158,187	11.00	43.00	35.00	81.40%	4,198,764
1989	2,972,140	100.5	1.294	3,845,935	10.00	43.00	35.89	83.47%	3,210,202
1990	2,302,354	102.9	1.263	2,908,701	9.00	43.00	36.49	84.86%	2,468,324
1991	935,053	105.6	1.231	1,150,819	8.00	43.00	37.10	86.28%	992,926
1992	839,463	108.9	1.194	1,002,114	7.00	43.00	38.01	88.40%	885,869
1993	975,577	116.8	1.113	1,085,831	6.00	43.00	38.62	89.81%	975,184
1994	831,037	117.8	1.104	917,104	5.00	43.00	39.23	91.23%	836,674
1995	329,873	123.2	1.055	348,080	4.00	43.00	40.16	93.40%	325,107
1996	215,986	127.0	1.024	221,088	3.00	43.00	40.79	94.86%	209,724
1997	728,357	127.7	1.018	741,475	2.00	43.00	41.41	96.30%	714,041
1998	2,587,453	128.4	1.012	2,619,695	1.00	43.00	42.36	98.51%	2,580,662
1999	1,221,400	130.0	1.000	1,221,400	0.00	43.00	43.00	100.00%	1,221,400
	42,572,438		1.772	75,449,200				69.35%	52,322,286

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Furniture
Plant Sub-Account:	Furniture
Index Number:	2122
Field Code:	FEZ
Survivor Curve:	O4
Average Service Life:	9.5

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1963	0	27.0	4.644	0	36.00	9.50	2.84	7.31%	0
1964	0	27.1	4.627	0	35.00	9.50	3.36	8.76%	0
1965	0	27.2	4.610	0	34.00	9.50	3.82	10.10%	0
1966	0	27.8	4.511	0	33.00	9.50	4.33	11.60%	0
1967	0	29.2	4.295	0	32.00	9.50	4.80	13.04%	0
1968	0	30.3	4.139	0	31.00	9.50	5.30	14.60%	0
1969	0	31.5	3.981	0	30.00	9.50	5.76	16.11%	0
1970	0	33.4	3.754	0	29.00	9.50	6.26	17.75%	0
1971	802	34.5	3.635	2,915	28.00	9.50	6.71	19.33%	564
1972	1,947	35.1	3.573	6,956	27.00	9.50	7.20	21.05%	1,464
1973	0	37.8	3.317	0	26.00	9.50	7.64	22.71%	0
1974	8,900	44.5	2.818	25,080	25.00	9.50	8.12	24.52%	6,149
1975	4,531	48.7	2.575	11,667	24.00	9.50	8.55	26.27%	3,065
1976	945	50.6	2.478	2,342	23.00	9.50	9.01	28.15%	659
1977	7,070	54.3	2.309	16,327	22.00	9.50	9.42	29.98%	4,895
1978	3,490	58.8	2.133	7,443	21.00	9.50	9.86	31.95%	2,378
1979	450	64.7	1.938	872	20.00	9.50	10.25	33.88%	296
1980	7,881	68.9	1.820	14,344	19.00	9.50	10.65	35.92%	5,152
1981	24,923	75.2	1.668	41,560	18.00	9.50	11.04	38.02%	15,800
1982	22,817	80.4	1.560	35,588	17.00	9.50	11.37	40.08%	14,263
1983	15,580	83.7	1.498	23,342	16.00	9.50	11.70	42.24%	9,859
1984	20,115	86.8	1.445	29,060	15.00	9.50	11.97	44.38%	12,898
1985	26,114	90.1	1.392	36,345	14.00	9.50	12.23	46.63%	16,946
1986	15,207	92.9	1.350	20,527	13.00	9.50	12.43	48.88%	10,033
1987	4,607	95.5	1.313	6,049	12.00	9.50	12.58	51.18%	3,096
1988	20,160	100.0	1.254	25,281	11.00	9.50	12.67	53.53%	13,532
1989	299,670	103.9	1.207	361,681	10.00	9.50	12.69	55.93%	202,280
1990	0	107.4	1.168	0	9.00	9.50	12.62	58.37%	0
1991	0	109.7	1.143	0	8.00	9.50	12.46	60.90%	0
1992	81,008	111.2	1.128	91,353	7.00	9.50	12.22	63.58%	58,082
1993	8,526	113.1	1.109	9,453	6.00	9.50	11.85	66.39%	6,276
1994	31,279	116.5	1.076	33,669	5.00	9.50	11.44	69.59%	23,429
1995	9,792	119.3	1.051	10,293	4.00	9.50	10.94	73.23%	7,537
1996	285,895	122.1	1.027	293,622	3.00	9.50	10.48	77.74%	228,276
1997	72,399	124.2	1.010	73,099	2.00	9.50	10.04	83.39%	60,956
1998	729,508	125.0	1.003	731,842	1.00	9.50	9.73	90.68%	663,637
1999	0	125.4	1.000	0	0.00	9.50	9.50	100.00%	0
	1,703,616		1.122	1,910,709				71.78%	1,371,520

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Office Equipment
Plant Sub-Account: Office Equipment
Index Number: 2123.1
Field Code: OEZ
Survivor Curve: L0.5
Average Service Life: 7

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1959	0	87.0	1.202	0	40.00	7.00	0.00	0.00%	0
1960	0	87.4	1.197	0	39.00	7.00	0.00	0.00%	0
1961	0	87.8	1.191	0	38.00	7.00	0.00	0.00%	0
1962	0	88.3	1.185	0	37.00	7.00	0.00	0.00%	0
1963	0	88.7	1.179	0	36.00	7.00	0.00	0.00%	0
1964	0	89.1	1.174	0	35.00	7.00	0.00	0.00%	0
1965	0	89.5	1.169	0	34.00	7.00	0.00	0.00%	0
1966	0	90.0	1.162	0	33.00	7.00	0.00	0.00%	0
1967	0	90.4	1.157	0	32.00	7.00	0.00	0.00%	0
1968	0	90.8	1.152	0	31.00	7.00	0.00	0.00%	0
1969	0	91.3	1.146	0	30.00	7.00	0.00	0.00%	0
1970	0	91.7	1.141	0	29.00	7.00	0.00	0.00%	0
1971	0	92.2	1.134	0	28.00	7.00	0.00	0.00%	0
1972	0	92.6	1.130	0	27.00	7.00	0.00	0.00%	0
1973	0	93.0	1.125	0	26.00	7.00	0.18	2.57%	0
1974	4,794	93.5	1.119	5,363	25.00	7.00	0.55	7.86%	422
1975	0	93.9	1.114	0	24.00	7.00	0.83	11.86%	0
1976	1,667	94.4	1.108	1,847	23.00	7.00	0.91	13.00%	240
1977	4,349	94.8	1.103	4,799	22.00	7.00	1.07	15.29%	734
1978	1,675	95.3	1.098	1,838	21.00	7.00	1.20	17.14%	315
1979	3,990	95.8	1.092	4,357	20.00	7.00	1.33	19.00%	828
1980	10,963	96.2	1.087	11,920	19.00	7.00	1.44	20.57%	2,452
1981	17,262	96.7	1.082	18,672	18.00	7.00	1.54	22.00%	4,108
1982	21,352	97.2	1.076	22,978	17.00	7.00	1.65	23.57%	5,416
1983	0	97.6	1.072	0	16.00	7.00	1.76	25.14%	0
1984	188,754	98.1	1.066	201,261	15.00	7.00	1.90	27.14%	54,622
1985	3,678	98.6	1.061	3,902	14.00	7.00	2.05	29.29%	1,143
1986	78,773	99.0	1.057	83,229	13.00	7.00	2.22	31.71%	26,392
1987	73,456	99.5	1.051	77,221	12.00	7.00	2.42	34.57%	26,695
1988	168,236	100.0	1.046	175,975	11.00	7.00	2.62	37.43%	65,867
1989	1,668,506	102.3	1.022	1,706,019	10.00	7.00	2.84	40.57%	692,132
1990	1,322,201	102.3	1.022	1,351,928	9.00	7.00	3.08	44.00%	594,848
1991	114,269	102.6	1.019	116,496	8.00	7.00	3.36	48.00%	55,918
1992	227,485	103.7	1.009	229,459	7.00	7.00	3.65	52.14%	119,640
1993	22,445	103.7	1.009	22,640	6.00	7.00	3.95	56.43%	12,776
1994	58,226	104.0	1.006	58,562	5.00	7.00	4.31	61.57%	36,057
1995	655,465	104.2	1.004	657,981	4.00	7.00	4.66	66.57%	438,018
1996	100,004	104.7	0.999	99,908	3.00	7.00	5.07	72.43%	72,364
1997	457,409	105.0	0.996	455,666	2.00	7.00	5.56	79.43%	361,936
1998	14,226	105.0	0.996	14,172	1.00	7.00	6.23	89.00%	12,613
1999	258,340	104.6	1.000	258,340	0.00	7.00	7.00	100.00%	258,340
	5,477,525		1.020	5,584,533				50.92%	2,843,875

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Company Communications Equipment
Plant Sub-Account: Stand Alone
Index Number: 2123.2
Field Code: OECA
Survivor Curve: L0.5
Average Service Life: 8.3

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1982	0	98.0	0.678	0	17.00	8.30	2.37	28.55%	0
1983	0	102.7	0.647	0	16.00	8.30	2.53	30.48%	0
1984	0	94.4	0.703	0	15.00	8.30	2.71	32.65%	0
1985	0	85.3	0.778	0	14.00	8.30	2.90	34.94%	0
1986	0	86.8	0.765	0	13.00	8.30	3.11	37.47%	0
1987	0	86.7	0.766	0	12.00	8.30	3.33	40.12%	0
1988	3,210	100.0	0.664	2,131	11.00	8.30	3.57	43.01%	917
1989	4,092	111.0	0.598	2,448	10.00	8.30	3.85	46.39%	1,136
1990	3,272	114.5	0.580	1,897	9.00	8.30	4.13	49.76%	944
1991	2,033	114.8	0.578	1,176	8.00	8.30	4.42	53.25%	626
1992	2,801	100.7	0.659	1,847	7.00	8.30	4.74	57.11%	1,055
1993	25,923	96.7	0.687	17,800	6.00	8.30	5.08	61.20%	10,894
1994	12,454	83.0	0.800	9,963	5.00	8.30	5.44	65.54%	6,530
1995	2,637	80.0	0.830	2,189	4.00	8.30	5.83	70.24%	1,537
1996	3,003	69.1	0.961	2,886	3.00	8.30	6.29	75.78%	2,187
1997	0	68.1	0.975	0	2.00	8.30	6.84	82.41%	0
1998	0	66.8	0.994	0	1.00	8.30	7.50	90.36%	0
1999	5,151	66.4	1.000	5,151	0.00	8.30	8.30	100.00%	5,151
	64,576		0.735	47,488				65.23%	30,976

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Company Communication Equipment
Plant Sub-Account: PBX & Key Intrasystems
Index Number: 2123.2
Field Code: OECB
Survivor Curve: L0.5
Average Service Life: 8.3

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1978	38,639	74.7	0.889	34,346	21.00	8.30	1.86	22.41%	7,697
1979	873	78.3	0.848	740	20.00	8.30	1.97	23.73%	176
1980	1,724	81.1	0.819	1,412	19.00	8.30	2.09	25.18%	355
1981	3,260	88.4	0.751	2,449	18.00	8.30	2.22	26.75%	655
1982	21,419	98.0	0.678	14,512	17.00	8.30	2.37	28.55%	4,143
1983	157,399	102.7	0.647	101,765	16.00	8.30	2.53	30.48%	31,018
1984	33,322	94.4	0.703	23,438	15.00	8.30	2.71	32.65%	7,653
1985	28,603	85.3	0.778	22,265	14.00	8.30	2.90	34.94%	7,780
1986	567,820	86.8	0.765	434,369	13.00	8.30	3.11	37.47%	162,758
1987	3	86.7	0.766	2	12.00	8.30	3.33	40.12%	1
1988	72,682	100.0	0.664	48,261	11.00	8.30	3.57	43.01%	20,757
1989	55,921	111.0	0.598	33,452	10.00	8.30	3.85	46.39%	15,518
1990	51,101	114.5	0.580	29,634	9.00	8.30	4.13	49.76%	14,746
1991	23,524	114.8	0.578	13,606	8.00	8.30	4.42	53.25%	7,245
1992	134,813	100.7	0.659	88,894	7.00	8.30	4.74	57.11%	50,767
1993	69,199	96.7	0.687	47,516	6.00	8.30	5.08	61.20%	29,080
1994	118,364	83.0	0.800	94,691	5.00	8.30	5.44	65.54%	62,061
1995	581	80.0	0.830	482	4.00	8.30	5.83	70.24%	339
1996	22,790	69.1	0.961	21,900	3.00	8.30	6.29	75.78%	16,595
1997	0	68.1	0.975	0	2.00	8.30	6.84	82.41%	0
1998	191	66.8	0.994	190	1.00	8.30	7.50	90.36%	172
1999	126	66.4	1.000	126	0.00	8.30	8.30	100.00%	126
	1,402,354		0.723	1,014,051				43.35%	439,641

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: General Purpose Computer
Plant Sub-Account: General Purpose Computer
Index Number: 2124
Field Code: GCZ
Survivor Curve: O1
Average Service Life: 5

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1960	0	71.3	0.303	0	39.00	5.00	0.00	0.00%	0
1961	0	69.5	0.311	0	38.00	5.00	0.00	0.00%	0
1962	0	66.6	0.324	0	37.00	5.00	0.00	0.00%	0
1963	0	65.6	0.329	0	36.00	5.00	0.00	0.00%	0
1964	0	65.6	0.329	0	35.00	5.00	0.00	0.00%	0
1965	0	63.9	0.338	0	34.00	5.00	0.00	0.00%	0
1966	0	62.8	0.344	0	33.00	5.00	0.00	0.00%	0
1967	0	65.3	0.331	0	32.00	5.00	0.00	0.00%	0
1968	0	69.6	0.310	0	31.00	5.00	0.00	0.00%	0
1969	0	72.5	0.298	0	30.00	5.00	0.00	0.00%	0
1970	0	74.5	0.290	0	29.00	5.00	0.00	0.00%	0
1971	0	76.8	0.281	0	28.00	5.00	0.00	0.00%	0
1972	0	78.0	0.277	0	27.00	5.00	0.00	0.00%	0
1973	0	77.6	0.278	0	26.00	5.00	0.00	0.00%	0
1974	0	82.2	0.263	0	25.00	5.00	0.00	0.00%	0
1975	0	88.3	0.245	0	24.00	5.00	0.00	0.00%	0
1976	2,230	90.3	0.239	533	23.00	5.00	0.00	0.00%	0
1977	0	86.1	0.251	0	22.00	5.00	0.00	0.00%	0
1978	0	78.4	0.276	0	21.00	5.00	0.00	0.00%	0
1979	0	74.9	0.288	0	20.00	5.00	0.00	0.00%	0
1980	0	75.1	0.288	0	19.00	5.00	0.00	0.00%	0
1981	64,507	82.3	0.262	16,930	18.00	5.00	0.00	0.00%	0
1982	18,625	92.9	0.233	4,330	17.00	5.00	0.00	0.00%	0
1983	866,462	103.8	0.208	180,304	16.00	5.00	0.00	0.00%	0
1984	288,877	108.6	0.199	57,456	15.00	5.00	0.00	0.00%	0
1985	165,757	103.0	0.210	34,761	14.00	5.00	0.00	0.00%	0
1986	1,439,726	101.1	0.214	307,597	13.00	5.00	0.00	0.00%	0
1987	900,033	98.9	0.218	196,569	12.00	5.00	0.00	0.00%	0
1988	554,276	100.0	0.216	119,724	11.00	5.00	0.00	0.00%	0
1989	24,060,104	99.9	0.216	5,202,185	10.00	5.00	0.00	0.00%	0
1990	2,433,138	95.8	0.225	548,599	9.00	5.00	0.50	10.00%	54,860
1991	1,310,940	79.4	0.272	356,629	8.00	5.00	1.00	20.00%	71,326
1992	6,399,262	66.6	0.324	2,075,436	7.00	5.00	1.50	30.00%	622,631
1993	11,436,799	58.4	0.370	4,230,049	6.00	5.00	2.00	40.00%	1,692,020
1994	16,901,961	53.7	0.402	6,798,554	5.00	5.00	2.50	50.00%	3,399,277
1995	10,617,387	48.1	0.449	4,767,891	4.00	5.00	3.00	60.00%	2,860,735
1996	8,087,743	40.4	0.535	4,324,140	3.00	5.00	3.50	70.00%	3,026,898
1997	6,575,394	32.6	0.663	4,356,703	2.00	5.00	4.00	80.00%	3,485,362
1998	8,167,572	24.3	0.889	7,260,064	1.00	5.00	4.50	90.00%	6,534,058
1999	11,725,904	21.6	1.000	11,725,904	0.00	5.00	5.00	100.00%	11,725,904
	112,016,697		0.469	52,564,359				63.68%	33,473,069

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Analog Switching Equipment
Plant Sub-Account: Analog Switching Equipment
Index Number: 2211
Field Code: AEZ
Survivor Curve: C2
Average Service Life: 33.34

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1955	30,903	60.6	2.053	63,438	44.00	33.34	11.34	34.01%	21,575
1956	0	62.1	2.003	0	43.00	33.34	11.84	35.51%	0
1957	0	65.0	1.914	0	42.00	33.34	12.34	37.01%	0
1958	0	66.4	1.873	0	41.00	33.34	12.84	38.51%	0
1959	2,486	65.6	1.896	4,714	40.00	33.34	13.34	40.00%	1,886
1960	0	64.8	1.920	0	39.00	33.34	13.84	41.50%	0
1961	0	64.1	1.941	0	38.00	33.34	14.34	43.00%	0
1962	4,830	63.7	1.953	9,433	37.00	33.34	14.84	44.50%	4,197
1963	0	64.6	1.926	0	36.00	33.34	15.34	46.00%	0
1964	362	65.1	1.911	692	35.00	33.34	15.84	47.50%	329
1965	668	64.3	1.935	1,292	34.00	33.34	16.34	49.00%	633
1966	415	65.0	1.914	794	33.00	33.34	16.84	50.50%	401
1967	0	67.4	1.846	0	32.00	33.34	17.34	52.00%	0
1968	616	70.9	1.755	1,081	31.00	33.34	17.84	53.50%	578
1969	1,350	74.0	1.681	2,269	30.00	33.34	18.34	55.00%	1,248
1970	181	76.3	1.630	295	29.00	33.34	18.84	56.50%	167
1971	947,818	79.3	1.569	1,486,867	28.00	33.34	19.34	58.00%	862,383
1972	1,720,491	81.2	1.532	2,635,826	27.00	33.34	19.84	59.50%	1,568,317
1973	2,943,958	81.1	1.534	4,515,763	26.00	33.34	20.34	61.00%	2,754,615
1974	121,219	85.1	1.462	177,199	25.00	33.34	20.84	62.50%	110,749
1975	1,926,418	91.4	1.361	2,621,952	24.00	33.34	21.34	63.99%	1,677,787
1976	177,638	94.7	1.314	233,349	23.00	33.34	21.84	65.49%	152,820
1977	104,583	92.4	1.346	140,802	22.00	33.34	22.34	66.99%	94,323
1978	610,818	87.4	1.423	869,402	21.00	33.34	22.84	68.49%	595,454
1979	1,871,890	86.2	1.443	2,701,428	20.00	33.34	23.34	69.99%	1,890,730
1980	6,316,234	87.8	1.417	8,949,197	19.00	33.34	23.84	71.49%	6,397,781
1981	5,899,834	95.4	1.304	7,693,285	18.00	33.34	24.34	72.99%	5,615,328
1982	22,593,223	106.9	1.164	26,291,833	17.00	33.34	24.84	74.49%	19,584,786
1983	7,686,580	118.3	1.052	8,082,929	16.00	33.34	25.34	75.99%	6,142,218
1984	11,215,307	129.8	0.958	10,748,723	15.00	33.34	25.84	77.49%	8,329,185
1985	4,553,326	118.1	1.053	4,796,221	14.00	33.34	26.34	78.99%	3,788,535
1986	7,140,581	109.6	1.135	8,104,820	13.00	33.34	26.84	80.49%	6,523,570
1987	4,948,775	105.9	1.175	5,813,292	12.00	33.34	27.34	81.99%	4,766,318
1988	6,805,031	100.0	1.244	8,465,459	11.00	33.34	27.84	83.49%	7,067,811
1989	6,300,094	98.9	1.258	7,924,486	10.00	33.34	28.34	84.99%	6,735,021
1990	3,712,433	95.4	1.304	4,840,950	9.00	33.34	28.84	86.49%	4,186,938
1991	8,151,767	92.3	1.348	10,986,780	8.00	33.34	29.34	87.99%	9,667,268
1992	4,777,889	92.0	1.352	6,460,537	7.00	33.34	29.84	89.49%	5,781,534
1993	5,406,583	96.0	1.296	7,006,030	6.00	33.34	30.34	90.99%	6,374,787
1994	3,699,142	93.5	1.330	4,921,639	5.00	33.34	30.84	92.49%	4,552,024
1995	3,106,302	102.7	1.211	3,762,648	4.00	33.34	31.34	93.99%	3,536,513
1996	4,273,004	105.3	1.181	5,048,069	3.00	33.34	31.84	95.49%	4,820,401
1997	1,803,897	109.6	1.135	2,047,489	2.00	33.34	32.34	96.99%	1,985,860
1998	5,596,508	123.2	1.010	5,651,019	1.00	33.34	32.84	98.49%	5,565,689

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Analog Switching Equipment
Plant Sub-Account:	Analog Switching Equipment
Index Number:	2211
Field Code:	AEZ
Survivor Curve:	C2
Average Service Life:	33.34

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1999	4,145,902	124.4	1.000	4,145,902	0.00	33.34	33.34	99.99%	4,145,487
	138,599,056		1.206	167,207,907				80.92%	135,305,249

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Digital Switching Equipment
Plant Sub-Account: Digital Switching Equipment
Index Number: 2212
Field Code: DEZ
Survivor Curve: O1
Average Service Life: 10

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1947	0	38.7	2.284	0	52.00	10.00	0.00	0.00%	0
1948	0	44.4	1.991	0	51.00	10.00	0.00	0.00%	0
1949	0	43.4	2.037	0	50.00	10.00	0.00	0.00%	0
1950	31,531	44.6	1.982	62,496	49.00	10.00	0.00	0.00%	0
1951	0	46.3	1.909	0	48.00	10.00	0.00	0.00%	0
1952	0	42.4	2.085	0	47.00	10.00	0.00	0.00%	0
1953	0	38.9	2.272	0	46.00	10.00	0.00	0.00%	0
1954	0	39.3	2.249	0	45.00	10.00	0.00	0.00%	0
1955	397,001	39.2	2.255	895,278	44.00	10.00	0.00	0.00%	0
1956	0	39.8	2.221	0	43.00	10.00	0.00	0.00%	0
1957	48,452	41.4	2.135	103,458	42.00	10.00	0.00	0.00%	0
1958	13,628	42.3	2.090	28,480	41.00	10.00	0.00	0.00%	0
1959	43,254	41.5	2.130	92,136	40.00	10.00	0.00	0.00%	0
1960	95,256	40.6	2.177	207,405	39.00	10.00	0.00	0.00%	0
1961	88,176	40.4	2.188	192,940	38.00	10.00	0.00	0.00%	0
1962	10,034	39.6	2.232	22,399	37.00	10.00	0.00	0.00%	0
1963	169	39.8	2.221	375	36.00	10.00	0.00	0.00%	0
1964	31,855	39.8	2.221	70,753	35.00	10.00	0.00	0.00%	0
1965	14,060	38.7	2.284	32,116	34.00	10.00	0.00	0.00%	0
1966	437,109	38.3	2.308	1,008,889	33.00	10.00	0.00	0.00%	0
1967	2,594	39.0	2.267	5,880	32.00	10.00	0.00	0.00%	0
1968	37,432	40.4	2.188	81,906	31.00	10.00	0.00	0.00%	0
1969	18,745	41.5	2.130	39,929	30.00	10.00	0.00	0.00%	0
1970	107,024	42.6	2.075	222,087	29.00	10.00	0.00	0.00%	0
1971	607,296	44.4	1.991	1,209,121	28.00	10.00	0.00	0.00%	0
1972	575,108	45.6	1.939	1,114,902	27.00	10.00	0.00	0.00%	0
1973	632,352	47.7	1.853	1,171,906	26.00	10.00	0.00	0.00%	0
1974	808,944	53.0	1.668	1,349,258	25.00	10.00	0.00	0.00%	0
1975	305,680	57.5	1.537	469,950	24.00	10.00	0.00	0.00%	0
1976	80,138	59.8	1.478	118,465	23.00	10.00	0.00	0.00%	0
1977	2,197,539	61.1	1.447	3,179,418	22.00	10.00	0.00	0.00%	0
1978	2,387,941	61.3	1.442	3,443,621	21.00	10.00	0.00	0.00%	0
1979	3,625,923	62.8	1.408	5,104,006	20.00	10.00	0.00	0.00%	0
1980	2,582,348	64.2	1.377	3,555,756	19.00	10.00	0.50	5.00%	177,788
1981	4,529,625	69.9	1.265	5,728,453	18.00	10.00	1.00	10.00%	572,845
1982	11,071,404	75.4	1.172	12,980,267	17.00	10.00	1.50	15.00%	1,947,040
1983	2,571,938	83.4	1.060	2,726,131	16.00	10.00	2.00	20.00%	545,226
1984	6,337,953	87.6	1.009	6,395,834	15.00	10.00	2.50	25.00%	1,598,958
1985	10,120,427	97.0	0.911	9,223,152	14.00	10.00	3.00	30.00%	2,766,946
1986	26,189,840	101.8	0.868	22,742,454	13.00	10.00	3.50	35.00%	7,959,859
1987	33,437,261	100.2	0.882	29,499,540	12.00	10.00	4.00	40.00%	11,799,816
1988	40,036,816	100.0	0.884	35,392,545	11.00	10.00	4.50	45.00%	15,926,645
1989	38,953,470	99.1	0.892	34,744,380	10.00	10.00	5.00	50.00%	17,372,190
1990	30,469,702	98.2	0.900	27,428,043	9.00	10.00	5.50	55.00%	15,085,423

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Digital Switching Equipment
Plant Sub-Account:	Digital Switching Equipment
Index Number:	2212
Field Code:	DEZ
Survivor Curve:	O1
Average Service Life:	10

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1991	32,038,707	99.6	0.888	28,445,956	8.00	10.00	6.00	60.00%	17,067,574
1992	47,446,729	94.7	0.933	44,282,866	7.00	10.00	6.50	65.00%	28,783,863
1993	47,220,109	91.2	0.969	45,769,412	6.00	10.00	7.00	70.00%	32,038,588
1994	59,784,926	88.8	0.996	59,517,153	5.00	10.00	7.50	75.00%	44,637,865
1995	92,935,566	86.2	1.026	95,336,156	4.00	10.00	8.00	80.00%	76,268,924
1996	65,965,159	86.9	1.017	67,103,798	3.00	10.00	8.50	85.00%	57,038,228
1997	55,987,858	84.5	1.046	58,571,913	2.00	10.00	9.00	90.00%	52,714,722
1998	92,932,319	88.1	1.003	93,248,774	1.00	10.00	9.50	95.00%	88,586,335
1999	106,015,893	88.4	1.000	106,015,893	0.00	10.00	10.00	100.00%	106,015,893
	819,225,291		0.987	808,935,651				71.56%	578,904,730

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Operator Systems
Plant Sub-Account:	Operator Systems
Index Number:	2220
Field Code:	OSZ
Survivor Curve:	S2
Average Service Life:	10.7

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1974	0	59.9	1.781	0	25.00	10.70	0.00	0.00%	0
1975	0	65.6	1.627	0	24.00	10.70	0.00	0.00%	0
1976	0	69.1	1.544	0	23.00	10.70	0.00	0.00%	0
1977	0	70.9	1.505	0	22.00	10.70	0.00	0.00%	0
1978	0	70.8	1.507	0	21.00	10.70	0.08	0.75%	0
1979	27,900	71.3	1.496	41,752	20.00	10.70	0.25	2.34%	977
1980	0	73.0	1.462	0	19.00	10.70	0.44	4.11%	0
1981	2,005	79.2	1.347	2,701	18.00	10.70	0.65	6.07%	164
1982	80,948	87.3	1.222	98,936	17.00	10.70	0.86	8.04%	7,954
1983	6,290	96.5	1.106	6,955	16.00	10.70	1.08	10.09%	702
1984	2,826	103.3	1.033	2,919	15.00	10.70	1.35	12.62%	368
1985	0	105.6	1.010	0	14.00	10.70	1.61	15.05%	0
1986	554	104.7	1.019	565	13.00	10.70	1.92	17.94%	101
1987	5,844	102.2	1.044	6,101	12.00	10.70	2.24	20.93%	1,277
1988	0	100.0	1.067	0	11.00	10.70	2.59	24.21%	0
1989	0	101.3	1.053	0	10.00	10.70	3.02	28.22%	0
1990	1,570,820	104.4	1.022	1,605,426	9.00	10.70	3.47	32.43%	520,640
1991	2,517,049	104.2	1.024	2,577,439	8.00	10.70	3.97	37.10%	956,230
1992	177,904	104.0	1.026	182,523	7.00	10.70	4.60	42.99%	78,466
1993	460,114	102.9	1.037	477,106	6.00	10.70	5.25	49.07%	234,116
1994	8,699	106.7	1.000	8,699	5.00	10.70	5.97	55.79%	4,853
1995	0	105.1	1.015	0	4.00	10.70	6.87	64.21%	0
1996	182,772	107.5	0.993	181,412	3.00	10.70	7.75	72.43%	131,397
1997	35,281	107.4	0.993	35,051	2.00	10.70	8.68	81.12%	28,433
1998	0	107.0	0.997	0	1.00	10.70	9.74	91.03%	0
1999	2,001,055	106.7	1.000	2,001,055	0.00	10.70	10.70	100.00%	2,001,055
	7,080,061		1.021	7,228,640				54.88%	3,966,734

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Radio Systems
Plant Sub-Account: Radio Systems
Index Number: 2231
Field Code: RDZ
Survivor Curve: S1.5
Average Service Life: 15.1

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1960	6,677	33.2	2.877	19,206	39.00	15.10	0.00	0.00%	0
1961	6,716	32.9	2.903	19,495	38.00	15.10	0.00	0.00%	0
1962	4,353	32.7	2.920	12,713	37.00	15.10	0.00	0.00%	0
1963	2,877	33.1	2.885	8,301	36.00	15.10	0.00	0.00%	0
1964	16,819	33.1	2.885	48,526	35.00	15.10	0.00	0.00%	0
1965	1,818	32.2	2.966	5,392	34.00	15.10	0.00	0.00%	0
1966	6,235	31.8	3.003	18,725	33.00	15.10	0.00	0.00%	0
1967	7,289	33.5	2.851	20,779	32.00	15.10	0.00	0.00%	0
1968	45,268	35.8	2.668	120,757	31.00	15.10	0.00	0.00%	0
1969	7,337	36.7	2.602	19,092	30.00	15.10	0.00	0.00%	0
1970	50,837	37.5	2.547	129,465	29.00	15.10	0.32	2.12%	2,745
1971	169,794	39.0	2.449	415,778	28.00	15.10	0.59	3.91%	16,257
1972	247,659	40.3	2.370	586,884	27.00	15.10	0.83	5.50%	32,279
1973	330,274	42.5	2.247	742,145	26.00	15.10	1.09	7.22%	53,583
1974	77,131	46.9	2.036	157,058	25.00	15.10	1.32	8.74%	13,727
1975	91,617	51.1	1.869	171,222	24.00	15.10	1.59	10.53%	18,030
1976	232,464	54.1	1.765	410,357	23.00	15.10	1.86	12.32%	50,556
1977	295,324	58.4	1.635	482,936	22.00	15.10	2.10	13.91%	67,176
1978	304,728	63.4	1.506	459,015	21.00	15.10	2.39	15.83%	72,662
1979	227,207	69.2	1.380	313,559	20.00	15.10	2.69	17.81%	55,845
1980	182,674	73.5	1.299	237,352	19.00	15.10	2.97	19.67%	46,687
1981	178,361	81.0	1.179	210,290	18.00	15.10	3.30	21.85%	45,948
1982	163,485	86.1	1.109	181,334	17.00	15.10	3.61	23.91%	43,357
1983	1,359,496	90.1	1.060	1,440,975	16.00	15.10	3.99	26.42%	380,706
1984	659,442	97.7	0.977	644,593	15.00	15.10	4.40	29.14%	187,834
1985	5,371,671	99.3	0.962	5,166,109	14.00	15.10	4.77	31.59%	1,631,974
1986	762,163	98.8	0.967	736,706	13.00	15.10	5.25	34.77%	256,153
1987	4,401,567	97.3	0.982	4,320,140	12.00	15.10	5.76	38.15%	1,648,134
1988	4,623,326	100.0	0.955	4,415,276	11.00	15.10	6.23	41.26%	1,821,743
1989	3,358,029	101.4	0.942	3,162,641	10.00	15.10	6.83	45.23%	1,430,462
1990	2,421,797	103.6	0.922	2,232,448	9.00	15.10	7.39	48.94%	1,092,560
1991	857,900	106.1	0.900	772,191	8.00	15.10	8.09	53.58%	413,740
1992	1,714,157	105.6	0.904	1,550,208	7.00	15.10	8.85	58.61%	908,577
1993	1,310,723	107.5	0.888	1,164,410	6.00	15.10	9.54	63.18%	735,674
1994	2,846,386	106.4	0.898	2,554,792	5.00	15.10	10.41	68.94%	1,761,274
1995	142,245	101.2	0.944	134,233	4.00	15.10	11.33	75.03%	100,715
1996	729,679	100.2	0.953	695,453	3.00	15.10	12.16	80.53%	560,048
1997	297,847	94.7	1.008	300,363	2.00	15.10	13.16	87.15%	261,766
1998	727,226	95.4	1.001	727,988	1.00	15.10	14.05	93.05%	677,393
1999	1,082,552	95.5	1.000	1,082,552	0.00	15.10	15.10	100.00%	1,082,552
	35,323,150		1.016	35,891,456				43.10%	15,470,156

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Circuit DDS
Plant Sub-Account:	Circuit DDS
Index Number:	2232
Field Code:	CRDA
Survivor Curve:	L1
Average Service Life:	8.1

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1974	0	53.0	1.638	0	25.00	8.10	0.19	2.35%	0
1975	0	57.5	1.510	0	24.00	8.10	0.35	4.32%	0
1976	13,302	59.8	1.452	19,308	23.00	8.10	0.50	6.17%	1,191
1977	66	61.1	1.421	94	22.00	8.10	0.66	8.15%	8
1978	4,321	61.3	1.416	6,118	21.00	8.10	0.84	10.37%	634
1979	31,919	62.8	1.382	44,117	20.00	8.10	1.01	12.47%	5,501
1980	4,896	64.2	1.352	6,620	19.00	8.10	1.19	14.69%	972
1981	10,435	69.9	1.242	12,958	18.00	8.10	1.39	17.16%	2,224
1982	138,493	75.4	1.151	159,432	17.00	8.10	1.58	19.51%	31,105
1983	173,111	83.4	1.041	180,168	16.00	8.10	1.77	21.85%	39,367
1984	121,222	87.6	0.991	120,115	15.00	8.10	2.00	24.69%	29,656
1985	341,551	97.0	0.895	305,635	14.00	8.10	2.21	27.28%	83,377
1986	100,982	101.8	0.853	86,103	13.00	8.10	2.46	30.37%	26,149
1987	260,934	100.2	0.866	226,039	12.00	8.10	2.70	33.33%	75,339
1988	430,092	100.0	0.868	373,320	11.00	8.10	2.95	36.42%	135,963
1989	291,734	98.8	0.879	256,301	10.00	8.10	3.24	40.00%	102,520
1990	282,109	99.0	0.877	247,344	9.00	8.10	3.52	43.46%	107,496
1991	309,050	100.3	0.865	267,453	8.00	8.10	3.82	47.16%	126,131
1992	670,464	92.2	0.941	631,196	7.00	8.10	4.16	51.36%	324,182
1993	731,765	90.6	0.958	701,073	6.00	8.10	4.50	55.56%	389,516
1994	896,309	89.4	0.971	870,242	5.00	8.10	4.87	60.12%	523,189
1995	1,008,687	86.9	0.999	1,007,526	4.00	8.10	5.30	65.43%	659,224
1996	837,484	87.2	0.995	833,642	3.00	8.10	5.79	71.48%	595,888
1997	734,459	87.1	0.997	731,929	2.00	8.10	6.40	79.01%	578,297
1998	731,215	86.8	1.000	731,215	1.00	8.10	7.22	89.14%	651,805
1999	368,025	86.8	1.000	368,025	0.00	8.10	8.10	100.00%	368,025
	8,492,625		0.964	8,185,973				59.34%	4,857,762

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Circuit Digital
Plant Sub-Account:	Circuit Digital
Index Number:	2232
Field Code:	CRD
Survivor Curve:	O2
Average Service Life:	10

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1950	151,692	44.6	1.982	300,663	49.00	10.00	0.00	0.00%	0
1951	0	46.3	1.909	0	48.00	10.00	0.00	0.00%	0
1952	3,609	42.4	2.085	7,524	47.00	10.00	0.00	0.00%	0
1953	0	38.9	2.272	0	46.00	10.00	0.00	0.00%	0
1954	749	39.3	2.249	1,685	45.00	10.00	0.00	0.00%	0
1955	737,034	39.2	2.255	1,662,087	44.00	10.00	0.00	0.00%	0
1956	394	39.8	2.221	875	43.00	10.00	0.00	0.00%	0
1957	1,641	41.4	2.135	3,504	42.00	10.00	0.00	0.00%	0
1958	544	42.3	2.090	1,137	41.00	10.00	0.00	0.00%	0
1959	666	41.5	2.130	1,419	40.00	10.00	0.00	0.00%	0
1960	1,262	40.6	2.177	2,748	39.00	10.00	0.00	0.00%	0
1961	22,563	40.4	2.188	49,371	38.00	10.00	0.00	0.00%	0
1962	1,336	39.6	2.232	2,982	37.00	10.00	0.00	0.00%	0
1963	6,884	39.8	2.221	15,290	36.00	10.00	0.00	0.00%	0
1964	43,099	39.8	2.221	95,727	35.00	10.00	0.00	0.00%	0
1965	20,933	38.7	2.284	47,816	34.00	10.00	0.00	0.00%	0
1966	59,510	38.3	2.308	137,355	33.00	10.00	0.00	0.00%	0
1967	77,917	39.0	2.267	176,612	32.00	10.00	0.00	0.00%	0
1968	9,779	40.4	2.188	21,398	31.00	10.00	0.00	0.00%	0
1969	327,820	41.5	2.130	698,296	30.00	10.00	0.40	4.00%	27,932
1970	208,647	42.6	2.075	432,967	29.00	10.00	0.89	8.90%	38,534
1971	466,490	44.4	1.991	928,777	28.00	10.00	1.38	13.80%	128,171
1972	495,276	45.6	1.939	960,140	27.00	10.00	1.85	18.50%	177,626
1973	951,699	47.7	1.853	1,763,736	26.00	10.00	2.32	23.20%	409,187
1974	1,196,551	53.0	1.668	1,995,757	25.00	10.00	2.77	27.70%	552,825
1975	834,144	57.5	1.537	1,282,406	24.00	10.00	3.21	32.10%	411,652
1976	1,085,942	59.8	1.478	1,605,306	23.00	10.00	3.63	36.30%	582,726
1977	712,952	61.1	1.447	1,031,505	22.00	10.00	4.02	40.20%	414,665
1978	1,038,904	61.3	1.442	1,498,191	21.00	10.00	4.39	43.90%	657,706
1979	2,002,245	62.8	1.408	2,818,447	20.00	10.00	4.72	47.20%	1,330,307
1980	3,727,123	64.2	1.377	5,132,051	19.00	10.00	5.02	50.20%	2,576,290
1981	6,515,999	69.9	1.265	8,240,548	18.00	10.00	5.27	52.70%	4,342,769
1982	12,388,237	75.4	1.172	14,524,140	17.00	10.00	5.47	54.70%	7,944,705
1983	21,143,649	83.4	1.060	22,411,254	16.00	10.00	5.63	56.30%	12,617,536
1984	29,096,112	87.6	1.009	29,361,830	15.00	10.00	5.74	57.40%	16,853,690
1985	49,313,875	97.0	0.911	44,941,717	14.00	10.00	5.82	58.20%	26,156,079
1986	51,645,717	101.8	0.868	44,847,558	13.00	10.00	5.89	58.90%	26,415,212
1987	41,471,890	100.2	0.882	36,587,975	12.00	10.00	5.99	59.90%	21,916,197
1988	46,458,503	100.0	0.884	41,069,317	11.00	10.00	6.12	61.20%	25,134,422
1989	41,665,493	99.1	0.892	37,163,358	10.00	10.00	6.30	63.00%	23,412,915
1990	53,834,118	98.2	0.900	48,460,089	9.00	10.00	6.54	65.40%	31,692,898
1991	54,557,795	99.6	0.888	48,439,803	8.00	10.00	6.82	68.20%	33,035,946
1992	51,192,730	94.7	0.933	47,779,075	7.00	10.00	7.15	71.50%	34,162,038
1993	44,952,094	91.2	0.969	43,571,075	6.00	10.00	7.50	75.00%	32,678,306

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Circuit Digital
Plant Sub-Account:	Circuit Digital
Index Number:	2232
Field Code:	CRD
Survivor Curve:	O2
Average Service Life:	10

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1994	62,727,461	88.8	0.996	62,446,508	5.00	10.00	7.87	78.70%	49,145,402
1995	80,249,683	86.2	1.026	82,322,587	4.00	10.00	8.26	82.60%	67,998,457
1996	121,882,842	86.9	1.017	123,986,689	3.00	10.00	8.67	86.70%	107,496,459
1997	81,098,786	84.5	1.046	84,841,807	2.00	10.00	9.09	90.90%	77,121,202
1998	123,445,446	88.1	1.003	123,865,805	1.00	10.00	9.52	95.20%	117,920,246
1999	140,227,026	88.4	1.000	140,227,026	0.00	10.00	10.00	100.00%	140,227,026
	1,128,054,861		0.982	1,107,763,931				77.96%	863,579,126

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Circuit Analog
Plant Sub-Account:	Circuit Analog
Index Number:	2232
Field Code:	CRA
Survivor Curve:	L0
Average Service Life:	8

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1949	4,816	43.4	2.544	12,251	50.00	8.00	0.00	0.00%	0
1950	11,710	44.6	2.475	28,986	49.00	8.00	0.00	0.00%	0
1951	1,971	46.3	2.384	4,700	48.00	8.00	0.00	0.00%	0
1952	733	42.4	2.604	1,909	47.00	8.00	0.00	0.00%	0
1953	0	38.9	2.838	0	46.00	8.00	0.00	0.00%	0
1954	3,664	39.3	2.809	10,293	45.00	8.00	0.00	0.00%	0
1955	6,288	39.2	2.816	17,709	44.00	8.00	0.00	0.00%	0
1956	3,278	39.8	2.774	9,093	43.00	8.00	0.00	0.00%	0
1957	5,185	41.4	2.667	13,827	42.00	8.00	0.00	0.00%	0
1958	40,733	42.3	2.610	106,310	41.00	8.00	0.00	0.00%	0
1959	5,702	41.5	2.660	15,169	40.00	8.00	0.00	0.00%	0
1960	13,834	40.6	2.719	37,618	39.00	8.00	0.00	0.00%	0
1961	2,543	40.4	2.733	6,949	38.00	8.00	0.00	0.00%	0
1962	9,529	39.6	2.788	26,566	37.00	8.00	0.00	0.00%	0
1963	427,078	39.8	2.774	1,184,659	36.00	8.00	0.00	0.00%	0
1964	13,767	39.8	2.774	38,188	35.00	8.00	0.00	0.00%	0
1965	21,102	38.7	2.853	60,198	34.00	8.00	0.00	0.00%	0
1966	30,480	38.3	2.883	87,859	33.00	8.00	0.00	0.00%	0
1967	28,567	39.0	2.831	80,867	32.00	8.00	0.40	5.00%	4,043
1968	31,008	40.4	2.733	84,735	31.00	8.00	0.48	6.00%	5,084
1969	76,673	41.5	2.660	203,969	30.00	8.00	0.62	7.75%	15,808
1970	155,074	42.6	2.592	401,882	29.00	8.00	0.73	9.13%	36,692
1971	400,906	44.4	2.486	996,847	28.00	8.00	0.86	10.75%	107,161
1972	188,980	45.6	2.421	457,531	27.00	8.00	0.98	12.25%	56,047
1973	276,994	47.7	2.314	641,093	26.00	8.00	1.11	13.88%	88,984
1974	229,966	53.0	2.083	479,024	25.00	8.00	1.24	15.50%	74,249
1975	356,528	57.5	1.920	684,534	24.00	8.00	1.38	17.25%	118,082
1976	244,738	59.8	1.846	451,824	23.00	8.00	1.52	19.00%	85,847
1977	353,477	61.1	1.807	638,688	22.00	8.00	1.67	20.88%	133,358
1978	517,503	61.3	1.801	932,012	21.00	8.00	1.82	22.75%	212,033
1979	1,159,491	62.8	1.758	2,038,341	20.00	8.00	1.98	24.75%	504,489
1980	1,266,952	64.2	1.720	2,178,684	19.00	8.00	2.14	26.75%	582,798
1981	1,829,590	69.9	1.579	2,889,653	18.00	8.00	2.32	29.00%	837,999
1982	3,164,892	75.4	1.464	4,634,006	17.00	8.00	2.49	31.13%	1,442,566
1983	3,590,547	83.4	1.324	4,752,954	16.00	8.00	2.69	33.63%	1,598,419
1984	3,381,676	87.6	1.260	4,261,838	15.00	8.00	2.88	36.00%	1,534,262
1985	4,126,296	97.0	1.138	4,696,320	14.00	8.00	3.09	38.63%	1,814,189
1986	4,453,965	101.8	1.084	4,830,233	13.00	8.00	3.30	41.25%	1,992,471
1987	4,547,991	100.2	1.102	5,010,960	12.00	8.00	3.54	44.25%	2,217,350
1988	3,346,578	100.0	1.104	3,694,622	11.00	8.00	3.77	47.13%	1,741,275
1989	3,188,852	103.7	1.065	3,394,882	10.00	8.00	4.04	50.50%	1,714,415
1990	1,651,687	103.3	1.069	1,765,211	9.00	8.00	4.30	53.75%	948,801
1991	1,247,794	106.5	1.037	1,293,488	8.00	8.00	4.59	57.38%	742,203
1992	2,015,225	108.2	1.020	2,056,200	7.00	8.00	4.89	61.13%	1,256,955

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Circuit Analog
Plant Sub-Account:	Circuit Analog
Index Number:	2232
Field Code:	CRA
Survivor Curve:	L0
Average Service Life:	8

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1993	1,338,798	109.7	1.006	1,347,341	6.00	8.00	5.22	65.25%	879,140
1994	794,135	111.8	0.987	784,191	5.00	8.00	5.56	69.50%	545,012
1995	810,638	111.8	0.987	800,487	4.00	8.00	5.94	74.25%	594,362
1996	698,426	111.6	0.989	690,916	3.00	8.00	6.32	79.00%	545,824
1997	507,149	111.9	0.987	500,351	2.00	8.00	6.78	84.75%	424,047
1998	1,236,809	109.8	1.005	1,243,568	1.00	8.00	7.28	91.00%	1,131,646
1999	1,079,213	110.4	1.000	1,079,213	0.00	8.00	8.00	100.00%	1,079,213
	48,899,531		1.261	61,658,744				40.65%	25,064,824

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Other Term Equipment
Plant Sub-Account: Other Term Equipment
Index Number: 2362
Field Code: OTO
Survivor Curve: O3
Average Service Life: 6.8

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1946	0	28.3	3.841	0	53.00	6.80	0.00	0.00%	0
1947	0	32.0	3.397	0	52.00	6.80	0.00	0.00%	0
1948	0	31.8	3.418	0	51.00	6.80	0.00	0.00%	0
1949	0	31.7	3.429	0	50.00	6.80	0.00	0.00%	0
1950	0	32.2	3.376	0	49.00	6.80	0.00	0.00%	0
1951	0	34.7	3.133	0	48.00	6.80	0.00	0.00%	0
1952	0	34.0	3.197	0	47.00	6.80	0.00	0.00%	0
1953	0	33.1	3.284	0	46.00	6.80	0.00	0.00%	0
1954	0	33.6	3.235	0	45.00	6.80	0.00	0.00%	0
1955	75,102	33.2	3.274	245,891	44.00	6.80	0.00	0.00%	0
1956	7,168	33.9	3.206	22,984	43.00	6.80	0.00	0.00%	0
1957	0	34.8	3.124	0	42.00	6.80	0.00	0.00%	0
1958	0	35.6	3.053	0	41.00	6.80	0.00	0.00%	0
1959	0	36.0	3.019	0	40.00	6.80	0.00	0.00%	0
1960	0	35.8	3.036	0	39.00	6.80	0.00	0.00%	0
1961	55,484	35.9	3.028	167,998	38.00	6.80	0.00	0.00%	0
1962	4,553	36.0	3.019	13,748	37.00	6.80	0.00	0.00%	0
1963	19,311	36.3	2.994	57,827	36.00	6.80	0.00	0.00%	0
1964	5,753	37.4	2.906	16,721	35.00	6.80	0.00	0.00%	0
1965	10,401	37.8	2.876	29,910	34.00	6.80	0.00	0.00%	0
1966	139,738	38.7	2.809	392,494	33.00	6.80	0.00	0.00%	0
1967	15,280	40.0	2.718	41,523	32.00	6.80	0.00	0.00%	0
1968	30,133	41.6	2.613	78,737	31.00	6.80	0.00	0.00%	0
1969	14,444	44.5	2.443	35,282	30.00	6.80	0.00	0.00%	0
1970	54,634	46.4	2.343	127,990	29.00	6.80	0.00	0.00%	0
1971	125,671	49.2	2.209	277,651	28.00	6.80	0.00	0.00%	0
1972	12,292	52.4	2.074	25,499	27.00	6.80	0.00	0.00%	0
1973	63,021	53.8	2.020	127,331	26.00	6.80	0.13	1.91%	2,432
1974	93,982	57.6	1.887	177,358	25.00	6.80	0.60	8.82%	15,643
1975	84,953	63.2	1.720	146,114	24.00	6.80	1.10	16.18%	23,641
1976	155,084	67.6	1.608	249,373	23.00	6.80	1.60	23.53%	58,678
1977	166,804	71.4	1.522	253,944	22.00	6.80	2.05	30.15%	76,564
1978	269,061	74.1	1.467	394,695	21.00	6.80	2.53	37.21%	146,866
1979	287,844	77.7	1.399	402,685	20.00	6.80	3.00	44.12%	177,665
1980	231,224	83.2	1.306	302,092	19.00	6.80	3.45	50.74%	153,281
1981	143,278	89.8	1.210	173,433	18.00	6.80	3.86	56.76%	98,441
1982	123,260	97.7	1.113	137,138	17.00	6.80	4.29	63.09%	86,520
1983	304,472	99.7	1.090	331,957	16.00	6.80	4.69	68.97%	228,951
1984	275,403	96.5	1.126	310,221	15.00	6.80	5.04	74.12%	229,936
1985	16,026	91.9	1.183	18,956	14.00	6.80	5.39	79.26%	15,024
1986	3,683,331	95.5	1.138	4,192,441	13.00	6.80	5.70	83.82%	3,514,104
1987	2,174,799	96.6	1.125	2,447,212	12.00	6.80	5.98	87.94%	2,152,078
1988	1,382,671	100.0	1.087	1,502,963	11.00	6.80	6.20	91.18%	1,370,402
1989	960,522	98.7	1.101	1,057,839	10.00	6.80	6.39	93.97%	994,052

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Other Term Equipment
Plant Sub-Account:	Other Term Equipment
Index Number:	2362
Field Code:	OTO
Survivor Curve:	O3
Average Service Life:	6.8

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1990	1,408,555	99.0	1.098	1,546,565	9.00	6.80	6.52	95.88%	1,482,846
1991	1,361,110	99.8	1.089	1,482,492	8.00	6.80	6.60	97.06%	1,438,906
1992	1,636,571	102.4	1.062	1,737,258	7.00	6.80	6.63	97.50%	1,693,827
1993	2,579,268	106.7	1.019	2,627,614	6.00	6.80	6.61	97.21%	2,554,304
1994	3,433,359	110.3	0.985	3,383,555	5.00	6.80	6.56	96.47%	3,264,116
1995	4,905,879	111.0	0.979	4,804,226	4.00	6.80	6.50	95.59%	4,592,359
1996	5,230,536	110.4	0.985	5,149,993	3.00	6.80	6.46	95.00%	4,892,494
1997	5,395,928	109.3	0.995	5,366,307	2.00	6.80	6.48	95.29%	5,113,554
1998	5,386,025	108.1	1.006	5,415,920	1.00	6.80	6.55	96.32%	5,216,614
1999	6,138,137	108.7	1.000	6,138,137	0.00	6.80	6.80	100.00%	6,138,137
	48,461,067		1.061	51,412,073				88.95%	45,731,434

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Pole Lines
Plant Sub-Account:	Pole Lines
Index Number:	2411
Field Code:	PLZA
Survivor Curve:	O1
Average Service Life:	46.4

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1925	64,891	12.1	13.802	895,603	74.00	46.40	9.51	20.50%	183,599
1926	28,839	12.1	13.802	398,026	73.00	46.40	9.98	21.51%	85,615
1927	72,160	12.1	13.802	995,927	72.00	46.40	10.44	22.50%	224,084
1928	55,479	12.1	13.802	765,702	71.00	46.40	10.90	23.49%	179,863
1929	84,819	12.1	13.802	1,170,642	70.00	46.40	11.37	24.50%	286,807
1930	92,458	12.1	13.802	1,276,073	69.00	46.40	11.83	25.50%	325,399
1931	20,894	12.1	13.802	288,372	68.00	46.40	12.30	26.51%	76,447
1932	26,477	12.1	13.802	365,426	67.00	46.40	12.99	28.00%	102,319
1933	27,175	12.1	13.802	375,060	66.00	46.40	13.46	29.01%	108,805
1934	21,849	12.1	13.802	301,552	65.00	46.40	13.92	30.00%	90,466
1935	57,910	12.1	13.802	799,254	64.00	46.40	14.38	30.99%	247,689
1936	42,578	12.1	13.802	587,647	63.00	46.40	14.85	32.00%	188,047
1937	63,972	12.1	13.802	882,919	62.00	46.40	15.31	33.00%	291,363
1938	43,267	12.1	13.802	597,156	61.00	46.40	16.01	34.50%	206,019
1939	50,425	12.1	13.802	695,948	60.00	46.40	16.47	35.50%	247,062
1940	126,592	12.1	13.802	1,747,179	59.00	46.40	16.94	36.51%	637,895
1941	137,285	12.1	13.802	1,894,760	58.00	46.40	17.40	37.50%	710,535
1942	80,067	12.1	13.802	1,105,057	57.00	46.40	17.86	38.49%	425,336
1943	41,120	12.1	13.802	567,524	56.00	46.40	18.33	39.50%	224,172
1944	52,554	12.1	13.802	725,332	55.00	46.40	18.79	40.50%	293,759
1945	136,072	12.1	13.802	1,878,019	54.00	46.40	19.49	42.00%	788,768
1946	179,258	12.1	13.802	2,474,057	53.00	46.40	19.95	43.00%	1,063,844
1947	234,395	14.3	11.678	2,737,340	52.00	46.40	20.42	44.01%	1,204,703
1948	242,125	14.7	11.361	2,750,672	51.00	46.40	20.88	45.00%	1,237,802
1949	253,642	14.5	11.517	2,921,256	50.00	46.40	21.34	45.99%	1,343,486
1950	346,045	14.7	11.361	3,931,260	49.00	46.40	21.81	47.00%	1,847,692
1951	380,035	15.7	10.637	4,042,411	48.00	46.40	22.50	48.49%	1,960,165
1952	442,253	16.6	10.060	4,449,172	47.00	46.40	22.97	49.50%	2,202,340
1953	583,746	17.2	9.709	5,667,766	46.00	46.40	23.43	50.50%	2,862,222
1954	835,921	17.0	9.824	8,211,695	45.00	46.40	23.90	51.51%	4,229,844
1955	673,735	16.8	9.940	6,697,247	44.00	46.40	24.36	52.50%	3,516,055
1956	721,790	17.9	9.330	6,734,018	43.00	46.40	24.82	53.49%	3,602,026
1957	944,636	19.1	8.743	8,259,383	42.00	46.40	25.29	54.50%	4,501,364
1958	1,223,987	19.3	8.653	10,590,976	41.00	46.40	25.98	55.99%	5,929,887
1959	1,655,248	19.8	8.434	13,960,930	40.00	46.40	26.45	57.00%	7,957,730
1960	1,574,146	20.2	8.267	13,013,979	39.00	46.40	26.91	58.00%	7,548,108
1961	883,961	20.3	8.227	7,271,994	38.00	46.40	27.38	59.01%	4,291,204
1962	652,870	20.4	8.186	5,344,573	37.00	46.40	27.84	60.00%	3,206,744
1963	776,309	20.8	8.029	6,232,866	36.00	46.40	28.30	60.99%	3,801,425
1964	661,435	21.5	7.767	5,137,658	35.00	46.40	29.00	62.50%	3,211,036
1965	531,007	22.2	7.523	3,994,512	34.00	46.40	29.46	63.49%	2,536,116
1966	350,965	23.4	7.137	2,504,750	33.00	46.40	29.93	64.50%	1,615,564
1967	251,215	24.6	6.789	1,705,403	32.00	46.40	30.39	65.50%	1,117,039
1968	312,055	25.9	6.448	2,012,092	31.00	46.40	30.86	66.51%	1,338,242

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Pole Lines
Plant Sub-Account: Pole Lines
Index Number: 2411
Field Code: PLZA
Survivor Curve: O1
Average Service Life: 46.4

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1969	343,521	27.4	6.095	2,093,723	30.00	46.40	31.32	67.50%	1,413,263
1970	356,318	29.4	5.680	2,023,983	29.00	46.40	31.78	68.49%	1,386,226
1971	273,963	32.9	5.076	1,390,633	28.00	46.40	32.48	70.00%	973,443
1972	222,085	34.9	4.785	1,062,699	27.00	46.40	32.94	70.99%	754,410
1973	387,735	37.9	4.406	1,708,489	26.00	46.40	33.41	72.00%	1,230,112
1974	280,517	48.9	3.415	958,003	25.00	46.40	33.87	73.00%	699,342
1975	175,148	52.4	3.187	558,201	24.00	46.40	34.34	74.01%	413,124
1976	1,252,040	55.7	2.998	3,753,872	23.00	46.40	34.80	75.00%	2,815,404
1977	337,702	59.2	2.821	952,639	22.00	46.40	35.50	76.51%	728,864
1978	373,626	62.7	2.663	995,144	21.00	46.40	35.96	77.50%	771,237
1979	189,895	69.8	2.393	454,333	20.00	46.40	36.42	78.49%	356,606
1980	200,326	78.3	2.133	427,260	19.00	46.40	36.89	79.50%	339,672
1981	226,019	85.6	1.951	440,948	18.00	46.40	37.35	80.50%	354,963
1982	1,060,268	91.3	1.829	1,939,373	17.00	46.40	37.82	81.51%	1,580,783
1983	1,152,088	95.3	1.752	2,018,874	16.00	46.40	38.51	83.00%	1,675,665
1984	892,370	100.0	1.670	1,490,258	15.00	46.40	38.98	84.01%	1,251,966
1985	1,197,865	99.7	1.675	2,006,454	14.00	46.40	39.44	85.00%	1,705,486
1986	1,614,928	99.8	1.673	2,702,334	13.00	46.40	39.90	85.99%	2,323,737
1987	973,767	98.4	1.697	1,652,633	12.00	46.40	40.37	87.00%	1,437,791
1988	1,308,264	100.0	1.670	2,184,801	11.00	46.40	40.83	88.00%	1,922,625
1989	2,351,991	103.5	1.614	3,795,000	10.00	46.40	41.30	89.01%	3,377,929
1990	1,696,634	110.5	1.511	2,564,144	9.00	46.40	41.99	90.50%	2,320,550
1991	1,649,511	116.3	1.436	2,368,601	8.00	46.40	42.46	91.51%	2,167,507
1992	1,387,089	121.7	1.372	1,903,401	7.00	46.40	42.92	92.50%	1,760,646
1993	1,725,717	128.5	1.300	2,242,761	6.00	46.40	43.38	93.49%	2,096,757
1994	1,824,713	139.2	1.200	2,189,131	5.00	46.40	43.85	94.50%	2,068,729
1995	1,459,452	146.0	1.144	1,669,373	4.00	46.40	44.31	95.50%	1,594,251
1996	747,156	151.2	1.104	825,232	3.00	46.40	45.01	97.00%	800,475
1997	1,851,677	158.8	1.052	1,947,293	2.00	46.40	45.47	98.00%	1,908,347
1998	1,522,899	165.4	1.010	1,537,631	1.00	46.40	45.94	99.01%	1,522,408
1999	1,543,863	167.0	1.000	1,543,863	0.00	46.40	46.40	100.00%	1,543,863
	46,616,809		4.341	202,360,271				60.95%	123,344,870

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Aerial Cable Metal
Plant Sub-Account: Aerial Cable Metal
Index Number: 2421
Field Code: ACM
Survivor Curve: R1
Average Service Life: 12

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1926	5,596	20.6	6.345	35,505	73.00	12.00	0.00	0.00%	0
1927	5,767	20.6	6.345	36,590	72.00	12.00	0.00	0.00%	0
1928	10,188	20.6	6.345	64,639	71.00	12.00	0.00	0.00%	0
1929	14,345	20.6	6.345	91,014	70.00	12.00	0.00	0.00%	0
1930	2,582	20.6	6.345	16,382	69.00	12.00	0.00	0.00%	0
1931	1,707	20.6	6.345	10,830	68.00	12.00	0.00	0.00%	0
1932	1,180	20.6	6.345	7,487	67.00	12.00	0.00	0.00%	0
1933	1,575	20.6	6.345	9,993	66.00	12.00	0.00	0.00%	0
1934	2,069	20.6	6.345	13,127	65.00	12.00	0.00	0.00%	0
1935	5,522	20.6	6.345	35,035	64.00	12.00	0.00	0.00%	0
1936	4,983	20.6	6.345	31,615	63.00	12.00	0.00	0.00%	0
1937	2,605	20.6	6.345	16,528	62.00	12.00	0.00	0.00%	0
1938	3,470	20.6	6.345	22,016	61.00	12.00	0.00	0.00%	0
1939	6,897	20.6	6.345	43,759	60.00	12.00	0.00	0.00%	0
1940	7,412	20.6	6.345	47,027	59.00	12.00	0.00	0.00%	0
1941	16,748	20.6	6.345	106,260	58.00	12.00	0.00	0.00%	0
1942	16,376	20.6	6.345	103,900	57.00	12.00	0.00	0.00%	0
1943	1,922	20.6	6.345	12,194	56.00	12.00	0.00	0.00%	0
1944	1,858	20.6	6.345	11,788	55.00	12.00	0.00	0.00%	0
1945	568	20.6	6.345	3,604	54.00	12.00	0.00	0.00%	0
1946	7,333	20.6	6.345	46,525	53.00	12.00	0.00	0.00%	0
1947	8,726	22.1	5.914	51,606	52.00	12.00	0.00	0.00%	0
1948	22,216	23.7	5.515	122,516	51.00	12.00	0.00	0.00%	0
1949	46,079	25.2	5.187	238,989	50.00	12.00	0.00	0.00%	0
1950	59,299	24.6	5.313	315,056	49.00	12.00	0.00	0.00%	0
1951	94,915	25.8	5.066	480,829	48.00	12.00	0.00	0.00%	0
1952	180,205	26.1	5.008	902,406	47.00	12.00	0.00	0.00%	0
1953	330,081	26.1	5.008	1,652,934	46.00	12.00	0.00	0.00%	0
1954	542,122	26.4	4.951	2,683,915	45.00	12.00	0.00	0.00%	0
1955	642,523	26.1	5.008	3,217,539	44.00	12.00	0.00	0.00%	0
1956	512,245	27.5	4.753	2,434,561	43.00	12.00	0.00	0.00%	0
1957	665,039	27.3	4.788	3,183,905	42.00	12.00	0.00	0.00%	0
1958	1,151,086	27.4	4.770	5,490,764	41.00	12.00	0.00	0.00%	0
1959	1,782,112	28.1	4.651	8,289,041	40.00	12.00	0.00	0.00%	0
1960	3,163,262	27.9	4.685	14,818,579	39.00	12.00	0.00	0.00%	0
1961	1,486,124	27.7	4.718	7,012,145	38.00	12.00	0.00	0.00%	0
1962	1,587,969	27.8	4.701	7,465,739	37.00	12.00	0.00	0.00%	0
1963	1,773,157	28.0	4.668	8,276,844	36.00	12.00	0.00	0.00%	0
1964	1,473,513	28.3	4.618	6,805,235	35.00	12.00	0.00	0.00%	0
1965	1,391,124	28.6	4.570	6,357,339	34.00	12.00	0.00	0.00%	0
1966	1,238,887	30.3	4.314	5,343,978	33.00	12.00	0.00	0.00%	0
1967	1,163,772	31.2	4.189	4,875,160	32.00	12.00	0.00	0.00%	0
1968	1,178,373	32.8	3.985	4,695,529	31.00	12.00	0.00	0.00%	0
1969	1,565,655	34.4	3.799	5,948,579	30.00	12.00	0.00	0.00%	0

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Aerial Cable Metal
Plant Sub-Account: Aerial Cable Metal
Index Number: 2421
Field Code: ACM
Survivor Curve: R1
Average Service Life: 12

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1970	1,988,092	38.2	3.421	6,802,189	29.00	12.00	0.00	0.00%	0
1971	1,270,818	40.3	3.243	4,121,487	28.00	12.00	0.00	0.00%	0
1972	1,563,656	43.2	3.025	4,730,783	27.00	12.00	0.00	0.00%	0
1973	1,518,428	45.0	2.904	4,410,190	26.00	12.00	0.00	0.00%	0
1974	1,449,535	50.9	2.568	3,722,087	25.00	12.00	0.00	0.00%	0
1975	996,266	54.7	2.389	2,380,475	24.00	12.00	0.06	0.50%	11,902
1976	975,646	58.6	2.230	2,176,057	23.00	12.00	0.36	3.00%	65,282
1977	1,372,889	62.2	2.101	2,884,833	22.00	12.00	0.72	6.00%	173,090
1978	1,339,964	64.8	2.017	2,702,674	21.00	12.00	1.00	8.33%	225,133
1979	1,521,517	72.7	1.798	2,735,382	20.00	12.00	1.29	10.75%	294,054
1980	1,786,019	81.1	1.612	2,878,331	19.00	12.00	1.63	13.58%	390,877
1981	1,850,493	86.8	1.506	2,786,399	18.00	12.00	1.95	16.25%	452,790
1982	5,239,628	91.7	1.425	7,468,041	17.00	12.00	2.29	19.08%	1,424,902
1983	3,808,911	95.8	1.364	5,196,500	16.00	12.00	2.69	22.42%	1,165,055
1984	4,274,768	97.9	1.335	5,706,968	15.00	12.00	3.07	25.58%	1,459,842
1985	4,831,397	96.2	1.359	6,564,071	14.00	12.00	3.47	28.92%	1,898,329
1986	5,016,687	97.3	1.343	6,738,756	13.00	12.00	3.95	32.92%	2,218,399
1987	6,286,802	97.9	1.335	8,393,105	12.00	12.00	4.41	36.75%	3,084,466
1988	7,308,853	100.0	1.307	9,552,671	11.00	12.00	4.89	40.75%	3,892,713
1989	6,854,258	106.5	1.227	8,411,751	10.00	12.00	5.46	45.50%	3,827,347
1990	7,669,578	109.4	1.195	9,162,832	9.00	12.00	5.99	49.92%	4,574,086
1991	7,232,374	111.2	1.175	8,500,641	8.00	12.00	6.56	54.67%	4,647,300
1992	6,373,845	113.6	1.151	7,333,288	7.00	12.00	7.22	60.17%	4,412,440
1993	6,477,742	114.9	1.138	7,368,502	6.00	12.00	7.83	65.25%	4,807,948
1994	6,558,420	117.9	1.109	7,270,445	5.00	12.00	8.46	70.50%	5,125,664
1995	8,596,955	127.3	1.027	8,826,567	4.00	12.00	9.19	76.58%	6,759,385
1996	10,995,199	127.2	1.028	11,297,740	3.00	12.00	9.85	82.08%	9,273,185
1997	9,892,832	129.5	1.009	9,984,503	2.00	12.00	10.52	87.67%	8,753,414
1998	8,640,054	130.1	1.005	8,679,901	1.00	12.00	11.30	94.17%	8,173,862
1999	7,438,539	130.7	1.000	7,438,539	0.00	12.00	12.00	100.00%	7,438,539
	164,522,015		1.761	287,654,714				29.39%	84,550,004

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Aerial Cable Non Metal
Plant Sub-Account:	Aerial Cable Non Metal
Index Number:	2421
Field Code:	ACN
Survivor Curve:	SQ
Average Service Life:	14.5

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1985	0	96.2	1.359	0	14.00	14.50	0.51	3.52%	0
1986	0	97.3	1.343	0	13.00	14.50	1.52	10.48%	0
1987	0	97.9	1.335	0	12.00	14.50	2.54	17.52%	0
1988	0	100.0	1.307	0	11.00	14.50	3.55	24.48%	0
1989	0	106.5	1.227	0	10.00	14.50	4.57	31.52%	0
1990	0	109.4	1.195	0	9.00	14.50	5.58	38.48%	0
1991	155,980	111.2	1.175	183,333	8.00	14.50	6.60	45.52%	83,453
1992	140,282	113.6	1.151	161,398	7.00	14.50	7.61	52.48%	84,702
1993	273,612	114.9	1.138	311,237	6.00	14.50	8.63	59.52%	185,248
1994	1,220,475	117.9	1.109	1,352,978	5.00	14.50	9.64	66.48%	899,460
1995	1,882,152	127.3	1.027	1,932,422	4.00	14.50	10.51	72.48%	1,400,619
1996	1,822,299	127.2	1.028	1,872,441	3.00	14.50	11.53	79.52%	1,488,965
1997	249,916	129.5	1.009	252,232	2.00	14.50	12.54	86.48%	218,130
1998	378,780	130.1	1.005	380,527	1.00	14.50	13.56	93.52%	355,869
1999	58,984	130.7	1.000	58,984	0.00	14.50	14.50	100.00%	58,984
	6,182,480		1.052	6,505,551				73.41%	4,775,430

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Underground Cable Metal
Plant Sub-Account: Underground Cable Metal
Index Number: 2422
Field Code: UGM
Survivor Curve: R1.5
Average Service Life: 15

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1925	10,103,864	19.5	4.867	49,172,138	74.00	15.00	0.00	0.00%	0
1926	28,503	19.5	4.867	138,715	73.00	15.00	0.00	0.00%	0
1927	22,833	19.5	4.867	111,121	72.00	15.00	0.00	0.00%	0
1928	74,154	19.5	4.867	360,883	71.00	15.00	0.00	0.00%	0
1929	177,061	19.5	4.867	861,697	70.00	15.00	0.00	0.00%	0
1930	30,722	19.5	4.867	149,514	69.00	15.00	0.00	0.00%	0
1931	347	19.5	4.867	1,689	68.00	15.00	0.00	0.00%	0
1932	700	19.5	4.867	3,407	67.00	15.00	0.00	0.00%	0
1933	12,406	19.5	4.867	60,376	66.00	15.00	0.00	0.00%	0
1934	34,034	19.5	4.867	165,632	65.00	15.00	0.00	0.00%	0
1935	10	19.5	4.867	49	64.00	15.00	0.00	0.00%	0
1936	7,585	19.5	4.867	36,914	63.00	15.00	0.00	0.00%	0
1937	59,532	19.5	4.867	289,722	62.00	15.00	0.00	0.00%	0
1938	13,749	19.5	4.867	66,912	61.00	15.00	0.00	0.00%	0
1939	18,544	19.5	4.867	90,247	60.00	15.00	0.00	0.00%	0
1940	69,954	19.5	4.867	340,443	59.00	15.00	0.00	0.00%	0
1941	113,280	19.5	4.867	551,296	58.00	15.00	0.00	0.00%	0
1942	27,054	19.5	4.867	131,663	57.00	15.00	0.00	0.00%	0
1943	56,594	19.5	4.867	275,424	56.00	15.00	0.00	0.00%	0
1944	0	19.5	4.867	0	55.00	15.00	0.00	0.00%	0
1945	3,742	19.5	4.867	18,211	54.00	15.00	0.00	0.00%	0
1946	10,785	19.5	4.867	52,487	53.00	15.00	0.00	0.00%	0
1947	289,931	25.8	3.678	1,066,452	52.00	15.00	0.00	0.00%	0
1948	82,986	27.3	3.476	288,475	51.00	15.00	0.00	0.00%	0
1949	45,482	27.8	3.414	155,260	50.00	15.00	0.00	0.00%	0
1950	41,680	26.2	3.622	150,971	49.00	15.00	0.00	0.00%	0
1951	189,856	29.9	3.174	602,586	48.00	15.00	0.00	0.00%	0
1952	280,364	30.2	3.142	881,011	47.00	15.00	0.00	0.00%	0
1953	499,955	30.1	3.153	1,576,270	46.00	15.00	0.00	0.00%	0
1954	662,931	30.3	3.132	2,076,309	45.00	15.00	0.00	0.00%	0
1955	1,269,698	33.3	2.850	3,618,449	44.00	15.00	0.00	0.00%	0
1956	1,361,537	36.0	2.636	3,589,163	43.00	15.00	0.00	0.00%	0
1957	1,887,240	34.7	2.735	5,161,357	42.00	15.00	0.00	0.00%	0
1958	1,556,081	32.8	2.893	4,502,198	41.00	15.00	0.00	0.00%	0
1959	1,518,548	33.6	2.824	4,288,994	40.00	15.00	0.00	0.00%	0
1960	2,977,477	35.0	2.711	8,073,216	39.00	15.00	0.00	0.00%	0
1961	1,741,187	33.7	2.816	4,903,224	38.00	15.00	0.00	0.00%	0
1962	1,535,930	33.5	2.833	4,351,038	37.00	15.00	0.00	0.00%	0
1963	1,494,917	34.3	2.767	4,136,082	36.00	15.00	0.00	0.00%	0
1964	1,955,126	35.8	2.651	5,182,722	35.00	15.00	0.00	0.00%	0
1965	2,328,906	38.7	2.452	5,710,935	34.00	15.00	0.00	0.00%	0
1966	1,980,655	41.3	2.298	4,551,190	33.00	15.00	0.00	0.00%	0
1967	2,417,886	43.0	2.207	5,336,218	32.00	15.00	0.00	0.00%	0
1968	2,233,417	46.0	2.063	4,607,636	31.00	15.00	0.00	0.00%	0

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Underground Cable Metal
Plant Sub-Account: Underground Cable Metal
Index Number: 2422
Field Code: UGM
Survivor Curve: R1.5
Average Service Life: 15

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1969	4,500,038	49.1	1.933	8,697,629	30.00	15.00	0.00	0.00%	0
1970	7,106,321	56.0	1.695	12,042,676	29.00	15.00	0.39	2.60%	313,110
1971	7,764,213	56.1	1.692	13,134,114	28.00	15.00	0.70	4.67%	613,363
1972	8,495,809	59.6	1.592	13,527,723	27.00	15.00	1.02	6.80%	919,885
1973	11,640,664	64.1	1.480	17,233,994	26.00	15.00	1.26	8.40%	1,447,655
1974	8,799,143	74.2	1.279	11,253,890	25.00	15.00	1.47	9.80%	1,102,881
1975	3,966,792	74.8	1.269	5,032,735	24.00	15.00	1.72	11.47%	577,255
1976	2,278,622	81.6	1.163	2,650,015	23.00	15.00	2.00	13.33%	353,247
1977	5,006,405	81.3	1.167	5,843,885	22.00	15.00	2.26	15.07%	880,673
1978	7,728,040	81.8	1.160	8,965,660	21.00	15.00	2.57	17.13%	1,535,818
1979	9,258,535	90.4	1.050	9,719,413	20.00	15.00	2.89	19.27%	1,872,931
1980	9,491,636	103.0	0.921	8,745,206	19.00	15.00	3.19	21.27%	1,860,105
1981	6,954,971	109.0	0.871	6,055,291	18.00	15.00	3.56	23.73%	1,436,921
1982	18,818,812	111.7	0.850	15,988,409	17.00	15.00	3.97	26.47%	4,232,132
1983	14,409,653	111.9	0.848	12,220,519	16.00	15.00	4.35	29.00%	3,543,950
1984	16,500,978	110.5	0.859	14,171,428	15.00	15.00	4.82	32.13%	4,553,280
1985	19,227,669	106.4	0.892	17,149,490	14.00	15.00	5.33	35.53%	6,093,214
1986	13,647,292	105.0	0.904	12,334,552	13.00	15.00	5.80	38.67%	4,769,771
1987	11,693,724	101.1	0.939	10,976,601	12.00	15.00	6.39	42.60%	4,676,032
1988	10,980,446	100.0	0.949	10,420,443	11.00	15.00	7.00	46.67%	4,863,221
1989	10,264,371	108.5	0.875	8,977,777	10.00	15.00	7.56	50.40%	4,524,800
1990	13,221,174	107.6	0.882	11,660,682	9.00	15.00	8.24	54.93%	6,405,213
1991	7,837,762	107.4	0.884	6,925,546	8.00	15.00	8.95	59.67%	4,132,473
1992	3,374,455	107.0	0.887	2,992,858	7.00	15.00	9.57	63.80%	1,909,443
1993	9,744,913	96.9	0.979	9,543,780	6.00	15.00	10.33	68.87%	6,572,801
1994	10,834,070	93.0	1.020	11,055,411	5.00	15.00	11.10	74.00%	8,181,004
1995	8,612,259	100.7	0.942	8,116,220	4.00	15.00	11.78	78.53%	6,373,668
1996	12,148,281	99.5	0.954	11,586,652	3.00	15.00	12.59	83.93%	9,724,677
1997	10,596,614	99.0	0.959	10,157,764	2.00	15.00	13.42	89.47%	9,088,152
1998	12,083,407	95.9	0.990	11,957,407	1.00	15.00	14.14	94.27%	11,272,248
1999	12,107,013	94.9	1.000	12,107,013	0.00	15.00	15.00	100.00%	12,107,013
	348,311,325		1.289	448,933,081				28.05%	125,936,936

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Underground Cable Non Metal
Plant Sub-Account:	Underground Cable Non Metal
Index Number:	2422
Field Code:	UGN
Survivor Curve:	SQ
Average Service Life:	13.1

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1984	288,498	110.5	0.859	247,769	15.00	13.10	0.00	0.00%	0
1985	6,049,156	106.4	0.892	5,395,347	14.00	13.10	0.00	0.00%	0
1986	5,318,470	105.0	0.904	4,806,884	13.00	13.10	0.20	1.53%	73,545
1987	2,610,677	101.1	0.939	2,450,576	12.00	13.10	1.11	8.47%	207,564
1988	3,986,987	100.0	0.949	3,783,651	11.00	13.10	2.16	16.49%	623,924
1989	5,868,439	108.5	0.875	5,132,856	10.00	13.10	3.21	24.50%	1,257,550
1990	4,228,942	107.6	0.882	3,729,801	9.00	13.10	4.13	31.53%	1,176,006
1991	9,292,290	107.4	0.884	8,210,785	8.00	13.10	5.17	39.47%	3,240,797
1992	5,209,729	107.0	0.887	4,620,591	7.00	13.10	6.22	47.48%	2,193,857
1993	7,494,771	96.9	0.979	7,340,080	6.00	13.10	7.14	54.50%	4,000,344
1994	6,567,885	93.0	1.020	6,702,068	5.00	13.10	8.19	62.52%	4,190,133
1995	7,574,220	100.7	0.942	7,137,969	4.00	13.10	9.10	69.47%	4,958,747
1996	9,478,340	99.5	0.954	9,040,145	3.00	13.10	10.15	77.48%	7,004,305
1997	4,347,677	99.0	0.959	4,167,622	2.00	13.10	11.20	85.50%	3,563,317
1998	6,069,150	95.9	0.990	6,005,864	1.00	13.10	12.12	92.52%	5,556,625
1999	2,598,651	94.9	1.000	2,598,651	0.00	13.10	13.10	100.00%	2,598,651
	86,983,882		0.935	81,370,658				49.95%	40,645,364

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Buried Cable Metal
Plant Sub-Account: Buried Cable Metal
Index Number: 2423
Field Code: BCM
Survivor Curve: L1.5
Average Service Life: 12

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1925	16,781,018	26.2	4.721	79,229,463	74.00	12.00	0.00	0.00%	0
1926	0	26.2	4.721	0	73.00	12.00	0.00	0.00%	0
1927	0	26.2	4.721	0	72.00	12.00	0.00	0.00%	0
1928	0	26.2	4.721	0	71.00	12.00	0.00	0.00%	0
1929	0	26.2	4.721	0	70.00	12.00	0.00	0.00%	0
1930	0	26.2	4.721	0	69.00	12.00	0.00	0.00%	0
1931	0	26.2	4.721	0	68.00	12.00	0.00	0.00%	0
1932	0	26.2	4.721	0	67.00	12.00	0.00	0.00%	0
1933	0	26.2	4.721	0	66.00	12.00	0.00	0.00%	0
1934	0	26.2	4.721	0	65.00	12.00	0.00	0.00%	0
1935	0	26.2	4.721	0	64.00	12.00	0.00	0.00%	0
1936	7,347	26.2	4.721	34,688	63.00	12.00	0.00	0.00%	0
1937	227	26.2	4.721	1,072	62.00	12.00	0.00	0.00%	0
1938	1,621	26.2	4.721	7,653	61.00	12.00	0.00	0.00%	0
1939	0	26.2	4.721	0	60.00	12.00	0.00	0.00%	0
1940	917	26.2	4.721	4,330	59.00	12.00	0.00	0.00%	0
1941	77,853	26.2	4.721	367,573	58.00	12.00	0.00	0.00%	0
1942	360	26.2	4.721	1,700	57.00	12.00	0.00	0.00%	0
1943	0	26.2	4.721	0	56.00	12.00	0.00	0.00%	0
1944	0	26.2	4.721	0	55.00	12.00	0.00	0.00%	0
1945	1,304	26.2	4.721	6,157	54.00	12.00	0.00	0.00%	0
1946	1,438	26.2	4.721	6,789	53.00	12.00	0.00	0.00%	0
1947	422	28.0	4.418	1,864	52.00	12.00	0.00	0.00%	0
1948	3,157	29.8	4.151	13,105	51.00	12.00	0.00	0.00%	0
1949	13,274	31.8	3.890	51,635	50.00	12.00	0.00	0.00%	0
1950	3,053	31.0	3.990	12,182	49.00	12.00	0.00	0.00%	0
1951	4,491	32.4	3.818	17,146	48.00	12.00	0.00	0.00%	0
1952	90,573	32.9	3.760	340,543	47.00	12.00	0.00	0.00%	0
1953	61,457	33.2	3.726	228,983	46.00	12.00	0.00	0.00%	0
1954	289,617	33.7	3.671	1,063,075	45.00	12.00	0.00	0.00%	0
1955	183,970	33.3	3.715	683,396	44.00	12.00	0.00	0.00%	0
1956	467,951	35.2	3.514	1,644,476	43.00	12.00	0.00	0.00%	0
1957	235,224	34.6	3.575	840,960	42.00	12.00	0.00	0.00%	0
1958	203,113	34.7	3.565	724,066	41.00	12.00	0.00	0.00%	0
1959	303,936	35.7	3.465	1,053,134	40.00	12.00	0.00	0.00%	0
1960	864,521	34.6	3.575	3,090,788	39.00	12.00	0.00	0.00%	0
1961	1,506,464	33.7	3.671	5,529,662	38.00	12.00	0.00	0.00%	0
1962	1,582,619	33.5	3.693	5,843,880	37.00	12.00	0.00	0.00%	0
1963	2,797,817	33.4	3.704	10,361,975	36.00	12.00	0.00	0.00%	0
1964	2,876,176	33.1	3.737	10,748,730	35.00	12.00	0.54	4.50%	483,693
1965	2,500,066	33.3	3.715	9,287,032	34.00	12.00	0.72	6.00%	557,222
1966	3,449,044	35.5	3.485	12,018,218	33.00	12.00	0.92	7.67%	921,797
1967	3,423,961	36.7	3.371	11,540,708	32.00	12.00	1.07	8.92%	1,029,431
1968	4,237,437	38.7	3.196	13,544,469	31.00	12.00	1.24	10.33%	1,399,144

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Buried Cable Metal
Plant Sub-Account:	Buried Cable Metal
Index Number:	2423
Field Code:	BCM
Survivor Curve:	L1.5
Average Service Life:	12

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1969	8,621,190	40.3	3.069	26,462,561	30.00	12.00	1.37	11.42%	3,022,024
1970	12,589,243	45.5	2.719	34,226,140	29.00	12.00	1.51	12.58%	4,305,648
1971	13,167,320	46.8	2.643	34,803,365	28.00	12.00	1.68	14.00%	4,872,471
1972	14,394,976	49.9	2.479	35,684,540	27.00	12.00	1.83	15.25%	5,441,892
1973	23,839,108	52.0	2.379	56,709,570	26.00	12.00	1.98	16.50%	9,357,079
1974	13,708,583	60.0	2.062	28,262,529	25.00	12.00	2.17	18.08%	5,109,865
1975	8,081,522	62.8	1.970	15,918,539	24.00	12.00	2.34	19.50%	3,104,115
1976	8,725,061	67.7	1.827	15,942,246	23.00	12.00	2.53	21.08%	3,360,625
1977	12,205,282	69.5	1.780	21,723,646	22.00	12.00	2.74	22.83%	4,959,508
1978	17,926,079	70.4	1.757	31,497,954	21.00	12.00	2.94	24.50%	7,716,999
1979	19,841,627	78.6	1.574	31,226,581	20.00	12.00	3.15	26.25%	8,196,977
1980	20,308,573	88.2	1.402	28,482,659	19.00	12.00	3.39	28.25%	8,046,351
1981	21,514,590	95.1	1.301	27,984,803	18.00	12.00	3.61	30.08%	8,417,829
1982	51,271,767	98.6	1.255	64,323,708	17.00	12.00	3.85	32.08%	20,635,045
1983	39,276,005	100.0	1.237	48,584,418	16.00	12.00	4.12	34.33%	16,679,031
1984	54,795,139	100.9	1.226	67,176,994	15.00	12.00	4.36	36.33%	24,405,402
1985	61,048,223	99.0	1.249	76,279,446	14.00	12.00	4.61	38.42%	29,306,563
1986	52,561,210	100.6	1.230	64,630,434	13.00	12.00	4.90	40.83%	26,388,606
1987	59,235,149	98.8	1.252	74,163,845	12.00	12.00	5.15	42.92%	31,831,122
1988	47,995,660	100.0	1.237	59,370,631	11.00	12.00	5.41	45.08%	26,764,281
1989	41,562,213	105.2	1.176	48,871,157	10.00	12.00	5.73	47.75%	23,335,978
1990	34,783,244	105.2	1.176	40,900,069	9.00	12.00	6.03	50.25%	20,552,285
1991	35,150,580	106.8	1.158	40,712,797	8.00	12.00	6.37	53.08%	21,610,353
1992	36,373,359	109.4	1.131	41,127,829	7.00	12.00	6.82	56.83%	23,372,945
1993	33,832,425	107.4	1.152	38,967,141	6.00	12.00	7.29	60.75%	23,672,538
1994	44,771,976	110.0	1.125	50,348,122	5.00	12.00	7.85	65.42%	32,937,741
1995	70,643,417	122.1	1.013	71,569,129	4.00	12.00	8.58	71.50%	51,171,927
1996	91,871,543	121.3	1.020	93,689,282	3.00	12.00	9.31	77.58%	72,684,145
1997	93,237,720	123.6	1.001	93,313,155	2.00	12.00	10.11	84.25%	78,616,333
1998	79,163,363	123.5	1.002	79,291,563	1.00	12.00	11.08	92.33%	73,209,900
1999	91,958,160	123.7	1.000	91,958,160	0.00	12.00	12.00	100.00%	91,958,160
	1,256,424,735		1.355	1,702,502,465				45.19%	769,435,029

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Buried Cable Non Metal
Plant Sub-Account:	Buried Cable Non Metal
Index Number:	2423
Field Code:	BCN
Survivor Curve:	SQ
Average Service Life:	17.6

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1985	572,771	99.0	1.249	715,674	14.00	17.60	3.61	20.51%	146,785
1986	144,757	100.6	1.230	177,996	13.00	17.60	4.66	26.48%	47,133
1987	1,201,640	98.8	1.252	1,504,482	12.00	17.60	5.72	32.50%	488,957
1988	1,509,741	100.0	1.237	1,867,550	11.00	17.60	6.60	37.50%	700,331
1989	240,697	105.2	1.176	283,025	10.00	17.60	7.66	43.52%	123,172
1990	1,871,908	105.2	1.176	2,201,093	9.00	17.60	8.71	49.49%	1,089,321
1991	3,910,865	106.8	1.158	4,529,719	8.00	17.60	9.77	55.51%	2,514,447
1992	963,481	109.4	1.131	1,089,420	7.00	17.60	10.65	60.51%	659,208
1993	1,176,352	107.4	1.152	1,354,886	6.00	17.60	11.70	66.48%	900,728
1994	1,228,278	110.0	1.125	1,381,254	5.00	17.60	12.76	72.50%	1,001,409
1995	2,358,672	122.1	1.013	2,389,580	4.00	17.60	13.64	77.50%	1,851,925
1996	1,332,090	121.3	1.020	1,358,446	3.00	17.60	14.70	83.52%	1,134,574
1997	252,319	123.6	1.001	252,523	2.00	17.60	15.75	89.49%	225,983
1998	196,529	123.5	1.002	196,847	1.00	17.60	16.63	94.49%	186,001
1999	284,557	123.7	1.000	284,557	0.00	17.60	17.60	100.00%	284,557
	17,244,657		1.136	19,587,055				57.97%	11,354,533

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Submarine Cable Metal
Plant Sub-Account: Submarine Cable Metal
Index Number: 2424
Field Code: SBM
Survivor Curve: SQ
Average Service Life: 15

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1981	2,572	101.5	1.256	3,232	18.00	15.00	0.00	0.00%	0
1982	0	104.6	1.219	0	17.00	15.00	0.00	0.00%	0
1983	0	104.6	1.219	0	16.00	15.00	0.00	0.00%	0
1984	0	105.2	1.212	0	15.00	15.00	0.08	0.53%	0
1985	0	103.2	1.236	0	14.00	15.00	1.13	7.53%	0
1986	0	101.9	1.252	0	13.00	15.00	2.03	13.53%	0
1987	0	99.3	1.284	0	12.00	15.00	3.08	20.53%	0
1988	0	100.0	1.275	0	11.00	15.00	4.13	27.53%	0
1989	0	106.2	1.201	0	10.00	15.00	5.03	33.53%	0
1990	0	106.5	1.197	0	9.00	15.00	6.08	40.53%	0
1991	0	109.3	1.167	0	8.00	15.00	7.13	47.53%	0
1992	0	112.4	1.135	0	7.00	15.00	8.03	53.53%	0
1993	0	117.0	1.090	0	6.00	15.00	9.08	60.53%	0
1994	0	122.2	1.044	0	5.00	15.00	10.13	67.53%	0
1995	0	127.1	1.003	0	4.00	15.00	11.03	73.53%	0
1996	0	126.2	1.010	0	3.00	15.00	12.08	80.53%	0
1997	0	128.2	0.995	0	2.00	15.00	13.13	87.53%	0
1998	0	127.5	1.000	0	1.00	15.00	14.03	93.53%	0
1999	0	127.5	1.000	0	0.00	15.00	15.00	100.00%	0
	2,572		1.256	3,232				0.00%	0

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Intra Building Cable Non Metal
Plant Sub-Account:	Intra Building Cable Non Metal
Index Number:	2426
Field Code:	IBN
Survivor Curve:	O1
Average Service Life:	11.5

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1985	16,089	99.9	1.222	19,664	14.00	11.50	4.49	39.04%	7,677
1986	14,640	100.8	1.211	17,734	13.00	11.50	5.00	43.48%	7,711
1987	4,417	99.1	1.232	5,442	12.00	11.50	5.52	48.00%	2,612
1988	21,088	100.0	1.221	25,748	11.00	11.50	5.98	52.00%	13,389
1989	6,347	105.4	1.158	7,353	10.00	11.50	6.50	56.52%	4,156
1990	14,010	106.9	1.142	16,002	9.00	11.50	7.02	61.04%	9,768
1991	19,609	108.1	1.130	22,149	8.00	11.50	7.48	65.04%	14,405
1992	17,812	110.3	1.107	19,718	7.00	11.50	7.99	69.48%	13,700
1993	30,377	108.8	1.122	34,090	6.00	11.50	8.51	74.00%	25,227
1994	39,320	111.7	1.093	42,981	5.00	11.50	9.03	78.52%	33,749
1995	70,539	118.4	1.031	72,743	4.00	11.50	9.49	82.52%	60,028
1996	90,088	119.0	1.026	92,435	3.00	11.50	10.01	87.04%	80,455
1997	52,137	122.1	1.000	52,137	2.00	11.50	10.52	91.48%	47,695
1998	56,841	121.2	1.007	57,263	1.00	11.50	10.98	95.48%	54,675
1999	127,533	122.1	1.000	127,533	0.00	11.50	11.50	100.00%	127,533
	580,847		1.055	612,992				82.02%	502,779

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Intra Building Cable Metal
Plant Sub-Account: Intra Building Cable Metal
Index Number: 2426
Field Code: IBM
Survivor Curve: L2
Average Service Life: 19

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1925	3,210,926	22.2	5.500	17,660,093	74.00	19.00	0.00	0.00%	0
1926	179	22.2	5.500	985	73.00	19.00	0.00	0.00%	0
1927	0	22.2	5.500	0	72.00	19.00	0.00	0.00%	0
1928	2,010	22.2	5.500	11,055	71.00	19.00	0.00	0.00%	0
1929	2,658	22.2	5.500	14,619	70.00	19.00	0.00	0.00%	0
1930	2,658	22.2	5.500	14,619	69.00	19.00	0.00	0.00%	0
1931	1,184	22.2	5.500	6,512	68.00	19.00	0.00	0.00%	0
1932	577	22.2	5.500	3,174	67.00	19.00	0.00	0.00%	0
1933	550	22.2	5.500	3,025	66.00	19.00	0.00	0.00%	0
1934	447	22.2	5.500	2,459	65.00	19.00	0.00	0.00%	0
1935	301	22.2	5.500	1,656	64.00	19.00	0.00	0.00%	0
1936	4,325	22.2	5.500	23,788	63.00	19.00	0.00	0.00%	0
1937	1,004	22.2	5.500	5,522	62.00	19.00	0.00	0.00%	0
1938	1,296	22.2	5.500	7,128	61.00	19.00	0.00	0.00%	0
1939	1,292	22.2	5.500	7,106	60.00	19.00	0.00	0.00%	0
1940	1,526	22.2	5.500	8,393	59.00	19.00	0.00	0.00%	0
1941	505	22.2	5.500	2,778	58.00	19.00	0.00	0.00%	0
1942	2,657	22.2	5.500	14,614	57.00	19.00	0.00	0.00%	0
1943	1,930	22.2	5.500	10,615	56.00	19.00	0.00	0.00%	0
1944	1,391	22.2	5.500	7,651	55.00	19.00	0.00	0.00%	0
1945	1,531	22.2	5.500	8,421	54.00	19.00	0.00	0.00%	0
1946	3,497	22.2	5.500	19,234	53.00	19.00	0.19	1.00%	192
1947	937	25.1	4.865	4,558	52.00	19.00	0.42	2.21%	101
1948	8,187	26.8	4.556	37,300	51.00	19.00	0.60	3.16%	1,179
1949	4,257	28.2	4.330	18,432	50.00	19.00	0.76	4.00%	737
1950	3,468	27.2	4.489	15,568	49.00	19.00	0.92	4.84%	753
1951	14,286	29.3	4.167	59,533	48.00	19.00	1.08	5.68%	3,381
1952	17,921	29.6	4.125	73,924	47.00	19.00	1.28	6.74%	4,982
1953	14,047	29.6	4.125	57,944	46.00	19.00	1.45	7.63%	4,421
1954	36,547	29.9	4.084	149,244	45.00	19.00	1.62	8.53%	12,730
1955	47,238	30.5	4.003	189,107	44.00	19.00	1.79	9.42%	17,814
1956	49,594	32.4	3.769	186,896	43.00	19.00	2.00	10.53%	19,680
1957	81,145	31.8	3.840	311,566	42.00	19.00	2.17	11.42%	35,581
1958	58,022	31.4	3.889	225,621	41.00	19.00	2.35	12.37%	27,909
1959	85,842	32.2	3.792	325,506	40.00	19.00	2.53	13.32%	43,357
1960	103,270	32.3	3.780	390,380	39.00	19.00	2.76	14.53%	56,722
1961	188,006	31.7	3.852	724,149	38.00	19.00	2.95	15.53%	112,460
1962	157,582	31.6	3.864	608,885	37.00	19.00	3.14	16.53%	100,649
1963	200,814	31.8	3.840	771,050	36.00	19.00	3.37	17.74%	136,784
1964	276,275	32.2	3.792	1,047,614	35.00	19.00	3.57	18.79%	196,847
1965	191,604	33.1	3.689	706,793	34.00	19.00	3.78	19.89%	140,581
1966	224,625	35.2	3.469	779,168	33.00	19.00	3.98	20.95%	163,236
1967	276,534	36.4	3.354	927,604	32.00	19.00	4.24	22.32%	207,041
1968	251,647	38.5	3.171	798,080	31.00	19.00	4.46	23.47%	187,309

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Intra Building Cable Metal
Plant Sub-Account: Intra Building Cable Metal
Index Number: 2426
Field Code: IBM
Survivor Curve: L2
Average Service Life: 19

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1969	338,233	40.5	3.015	1,019,710	30.00	19.00	4.68	24.63%	251,155
1970	581,035	45.6	2.678	1,555,798	29.00	19.00	4.91	25.84%	402,018
1971	632,592	46.9	2.603	1,646,897	28.00	19.00	5.19	27.32%	449,932
1972	694,148	50.1	2.437	1,691,726	27.00	19.00	5.42	28.53%	482,649
1973	953,851	52.6	2.321	2,214,167	26.00	19.00	5.66	29.79%	659,600
1974	1,020,386	60.4	2.022	2,062,734	25.00	19.00	5.90	31.05%	640,479
1975	789,036	63.0	1.938	1,529,227	24.00	19.00	6.19	32.58%	498,222
1976	760,195	68.1	1.793	1,362,993	23.00	19.00	6.43	33.84%	461,237
1977	666,764	69.9	1.747	1,164,691	22.00	19.00	6.66	35.05%	408,224
1978	844,517	71.3	1.712	1,446,221	21.00	19.00	6.89	36.26%	524,400
1979	1,217,841	79.5	1.536	1,870,420	20.00	19.00	7.17	37.74%	705,896
1980	1,086,741	89.4	1.366	1,484,240	19.00	19.00	7.39	38.89%	577,221
1981	1,263,681	95.7	1.276	1,612,283	18.00	19.00	7.62	40.11%	646,687
1982	2,204,156	99.5	1.227	2,704,798	17.00	19.00	7.91	41.63%	1,126,008
1983	1,968,564	101.5	1.203	2,368,095	16.00	19.00	8.16	42.95%	1,017,097
1984	2,095,785	102.1	1.196	2,506,321	15.00	19.00	8.43	44.37%	1,112,055
1985	1,907,930	99.9	1.222	2,331,914	14.00	19.00	8.73	45.95%	1,071,515
1986	2,579,266	100.8	1.211	3,124,289	13.00	19.00	9.13	48.05%	1,501,221
1987	2,107,502	99.1	1.232	2,596,630	12.00	19.00	9.52	50.11%	1,301,171
1988	1,405,370	100.0	1.221	1,715,957	11.00	19.00	9.97	52.47%	900,363
1989	1,202,638	105.4	1.158	1,393,189	10.00	19.00	10.48	55.16%	768,483
1990	1,040,743	106.9	1.142	1,188,725	9.00	19.00	11.18	58.84%	699,446
1991	836,003	108.1	1.130	944,274	8.00	19.00	11.85	62.37%	588,943
1992	624,207	110.3	1.107	690,985	7.00	19.00	12.57	66.16%	457,156
1993	479,939	108.8	1.122	538,608	6.00	19.00	13.34	70.21%	378,157
1994	508,226	111.7	1.093	555,545	5.00	19.00	14.31	75.32%	418,437
1995	797,377	118.4	1.031	822,295	4.00	19.00	15.16	79.79%	656,109
1996	999,356	119.0	1.026	1,025,390	3.00	19.00	16.03	84.37%	865,121
1997	1,316,707	122.1	1.000	1,316,707	2.00	19.00	16.94	89.16%	1,173,976
1998	1,187,630	121.2	1.007	1,196,449	1.00	19.00	18.05	95.00%	1,136,627
1999	1,377,986	122.1	1.000	1,377,986	0.00	19.00	19.00	100.00%	1,377,986
	41,022,697		1.836	75,301,628				32.84%	24,732,039

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Aerial Wire
Plant Sub-Account: Aerial Wire
Index Number: 2431
Field Code: AWZ
Survivor Curve: L0
Average Service Life: 8.9

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1952	2	24.1	5.502	11	47.00	8.90	0.00	0.00%	0
1953	9	25.6	5.180	47	46.00	8.90	0.00	0.00%	0
1954	143	26.4	5.023	718	45.00	8.90	0.00	0.00%	0
1955	741	26.8	4.948	3,666	44.00	8.90	0.00	0.00%	0
1956	1,358	27.9	4.753	6,454	43.00	8.90	0.00	0.00%	0
1957	2,816	27.5	4.822	13,578	42.00	8.90	0.00	0.00%	0
1958	4,306	28.1	4.719	20,319	41.00	8.90	0.00	0.00%	0
1959	7,198	28.5	4.653	33,490	40.00	8.90	0.00	0.00%	0
1960	10,634	29.0	4.572	48,623	39.00	8.90	0.00	0.00%	0
1961	15,063	29.1	4.557	68,638	38.00	8.90	0.00	0.00%	0
1962	22,914	27.9	4.753	108,903	37.00	8.90	0.00	0.00%	0
1963	8,958	27.4	4.839	43,351	36.00	8.90	0.31	3.48%	1,509
1964	10,465	27.7	4.787	50,096	35.00	8.90	0.48	5.39%	2,700
1965	11,897	28.0	4.736	56,341	34.00	8.90	0.62	6.97%	3,927
1966	17,683	29.2	4.541	80,300	33.00	8.90	0.72	8.09%	6,496
1967	17,113	30.7	4.319	73,915	32.00	8.90	0.84	9.44%	6,978
1968	14,513	32.9	4.030	58,493	31.00	8.90	0.97	10.90%	6,376
1969	15,499	35.8	3.704	57,407	30.00	8.90	1.10	12.36%	7,095
1970	25,847	39.0	3.400	87,880	29.00	8.90	1.22	13.71%	12,048
1971	52,648	40.4	3.282	172,800	28.00	8.90	1.35	15.17%	26,214
1972	61,680	42.1	3.150	194,270	27.00	8.90	1.50	16.85%	32,734
1973	76,698	43.5	3.048	233,797	26.00	8.90	1.64	18.43%	43,089
1974	104,357	52.6	2.521	263,075	25.00	8.90	1.78	20.00%	52,615
1975	84,346	56.2	2.359	199,009	24.00	8.90	1.93	21.69%	43,165
1976	66,339	59.4	2.232	148,090	23.00	8.90	2.09	23.48%	34,772
1977	69,286	63.6	2.085	144,455	22.00	8.90	2.25	25.28%	36,518
1978	84,235	66.0	2.009	169,236	21.00	8.90	2.41	27.08%	45,829
1979	146,536	70.7	1.876	274,833	20.00	8.90	2.58	28.99%	79,674
1980	290,279	80.1	1.655	480,537	19.00	8.90	2.77	31.12%	149,543
1981	185,916	84.1	1.577	293,133	18.00	8.90	2.96	33.26%	97,496
1982	143,795	89.0	1.490	214,238	17.00	8.90	3.15	35.39%	75,819
1983	224,529	92.1	1.440	323,263	16.00	8.90	3.35	37.64%	121,676
1984	129,208	96.1	1.380	178,283	15.00	8.90	3.55	39.89%	71,117
1985	189,299	95.2	1.393	263,666	14.00	8.90	3.79	42.58%	112,269
1986	230,446	92.8	1.429	329,280	13.00	8.90	4.02	45.17%	148,736
1987	279,286	95.9	1.383	386,166	12.00	8.90	4.26	47.87%	184,858
1988	262,649	100.0	1.326	348,273	11.00	8.90	4.51	50.67%	176,470
1989	242,953	107.0	1.239	301,080	10.00	8.90	4.80	53.93%	162,372
1990	321,305	109.8	1.208	388,024	9.00	8.90	5.09	57.19%	221,911
1991	428,579	109.4	1.212	519,466	8.00	8.90	5.38	60.45%	314,017
1992	300,726	111.5	1.189	357,635	7.00	8.90	5.69	63.93%	228,636
1993	464,730	114.0	1.163	540,554	6.00	8.90	6.05	67.98%	367,469
1994	489,839	117.5	1.129	552,789	5.00	8.90	6.41	72.02%	398,118
1995	467,106	126.5	1.048	489,630	4.00	8.90	6.78	76.18%	373,000

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Aerial Wire
Plant Sub-Account:	Aerial Wire
Index Number:	2431
Field Code:	AWZ
Survivor Curve:	L0
Average Service Life:	8.9

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1996	592,855	127.2	1.042	618,023	3.00	8.90	7.18	80.67%	498,559
1997	993,241	130.1	1.019	1,012,327	2.00	8.90	7.67	86.18%	872,424
1998	782,855	131.5	1.008	789,404	1.00	8.90	8.21	92.25%	728,225
1999	846,076	132.6	1.000	846,076	0.00	8.90	8.90	100.00%	846,076
	8,798,956		1.346	11,843,641				55.65%	6,590,530

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account: Conduit Systems
Plant Sub-Account: Conduit Systems
Index Number: 2441
Field Code: UCZ
Survivor Curve: SQ
Average Service Life: 56.6

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1925	13,801,685	10.4	10.615	146,510,195	74.00	56.60	0.00	0.00%	0
1926	191,186	10.4	10.615	2,029,513	73.00	56.60	0.00	0.00%	0
1927	81,099	10.4	10.615	860,897	72.00	56.60	0.00	0.00%	0
1928	293,773	10.4	10.615	3,118,513	71.00	56.60	0.00	0.00%	0
1929	304,723	10.4	10.615	3,234,752	70.00	56.60	0.00	0.00%	0
1930	166,778	10.4	10.615	1,770,413	69.00	56.60	0.00	0.00%	0
1931	3,265	10.4	10.615	34,659	68.00	56.60	0.00	0.00%	0
1932	6,869	10.4	10.615	72,917	67.00	56.60	0.00	0.00%	0
1933	103,398	10.4	10.615	1,097,610	66.00	56.60	0.00	0.00%	0
1934	794	10.4	10.615	8,429	65.00	56.60	0.00	0.00%	0
1935	3,241	10.4	10.615	34,404	64.00	56.60	0.00	0.00%	0
1936	83,574	10.4	10.615	887,170	63.00	56.60	0.00	0.00%	0
1937	8,254	10.4	10.615	87,619	62.00	56.60	0.00	0.00%	0
1938	0	10.4	10.615	0	61.00	56.60	0.00	0.00%	0
1939	11,619	10.4	10.615	123,340	60.00	56.60	0.00	0.00%	0
1940	4,056	10.4	10.615	43,056	59.00	56.60	0.00	0.00%	0
1941	57,168	10.4	10.615	606,860	58.00	56.60	0.00	0.00%	0
1942	271	10.4	10.615	2,877	57.00	56.60	0.00	0.00%	0
1943	43,114	10.4	10.615	457,672	56.00	56.60	0.85	1.50%	6,865
1944	61	10.4	10.615	648	55.00	56.60	1.98	3.50%	23
1945	33,299	10.4	10.615	353,482	54.00	56.60	3.11	5.49%	19,406
1946	51,477	10.4	10.615	546,448	53.00	56.60	3.68	6.50%	35,519
1947	824,542	11.8	9.356	7,714,359	52.00	56.60	4.81	8.50%	655,721
1948	448,638	12.7	8.693	3,899,971	51.00	56.60	5.94	10.49%	409,107
1949	128,422	13.3	8.301	1,065,999	50.00	56.60	7.08	12.51%	133,356
1950	132,321	13.6	8.118	1,074,135	49.00	56.60	7.64	13.50%	145,008
1951	205,453	14.3	7.720	1,586,155	48.00	56.60	8.77	15.49%	245,695
1952	1,471,458	15.0	7.360	10,829,931	47.00	56.60	9.91	17.51%	1,896,321
1953	484,165	15.7	7.032	3,404,574	46.00	56.60	11.04	19.51%	664,232
1954	325,476	16.2	6.815	2,218,059	45.00	56.60	11.60	20.49%	454,480
1955	1,487,507	16.5	6.691	9,952,774	44.00	56.60	12.74	22.51%	2,240,369
1956	1,103,111	17.5	6.309	6,959,055	43.00	56.60	13.87	24.51%	1,705,664
1957	1,167,969	18.1	6.099	7,123,966	42.00	56.60	15.00	26.50%	1,887,851
1958	1,150,898	18.8	5.872	6,758,465	41.00	56.60	16.13	28.50%	1,926,162
1959	1,385,419	19.1	5.780	8,007,867	40.00	56.60	16.70	29.51%	2,363,122
1960	5,177,676	19.3	5.720	29,617,380	39.00	56.60	17.83	31.50%	9,329,475
1961	876,340	19.5	5.662	4,961,433	38.00	56.60	18.96	33.50%	1,662,080
1962	1,141,055	19.9	5.548	6,330,275	37.00	56.60	20.09	35.49%	2,246,615
1963	1,030,861	20.1	5.493	5,662,043	36.00	56.60	20.66	36.50%	2,066,646
1964	1,607,653	20.7	5.333	8,574,149	35.00	56.60	21.79	38.50%	3,301,047
1965	1,343,925	21.2	5.208	6,998,553	34.00	56.60	22.92	40.49%	2,833,714
1966	1,393,341	21.9	5.041	7,023,966	33.00	56.60	24.06	42.51%	2,985,888
1967	979,999	23.5	4.698	4,603,910	32.00	56.60	24.62	43.50%	2,002,701
1968	1,266,694	24.8	4.452	5,638,831	31.00	56.60	25.75	45.49%	2,565,104

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999

Plant Account:	Conduit Systems
Plant Sub-Account:	Conduit Systems
Index Number:	2441
Field Code:	UCZ
Survivor Curve:	SQ
Average Service Life:	56.6

Year of Placing	Original Cost as of 12/31/1997	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 6/30/1998	Life Expectancy When New	Life Expectancy 6/30/1998	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1969	2,221,055	26.5	4.166	9,252,999	30.00	56.60	26.89	47.51%	4,396,100
1970	5,529,001	28.3	3.901	21,568,965	29.00	56.60	28.02	49.51%	10,678,795
1971	4,298,951	31.1	3.550	15,260,585	28.00	56.60	29.15	51.50%	7,859,201
1972	2,010,842	33.5	3.296	6,626,775	27.00	56.60	29.72	52.51%	3,479,719
1973	5,706,420	36.0	3.067	17,499,688	26.00	56.60	30.85	54.51%	9,539,080
1974	5,478,486	41.0	2.693	14,751,826	25.00	56.60	31.98	56.50%	8,334,782
1975	1,788,606	45.9	2.405	4,302,007	24.00	56.60	33.11	58.50%	2,516,674
1976	955,288	50.0	2.208	2,109,276	23.00	56.60	33.68	59.51%	1,255,230
1977	1,307,219	53.0	2.083	2,722,962	22.00	56.60	34.81	61.50%	1,674,622
1978	2,324,227	56.6	1.951	4,533,475	21.00	56.60	35.94	63.50%	2,878,756
1979	3,812,204	63.6	1.736	6,617,411	20.00	56.60	37.07	65.49%	4,333,742
1980	2,370,954	69.3	1.593	3,777,104	19.00	56.60	37.64	66.50%	2,511,774
1981	1,289,144	74.6	1.480	1,907,795	18.00	56.60	38.77	68.50%	1,306,839
1982	10,721,108	79.3	1.392	14,925,729	17.00	56.60	39.90	70.49%	10,521,146
1983	7,567,337	81.3	1.358	10,275,941	16.00	56.60	41.04	72.51%	7,451,085
1984	7,318,527	83.8	1.317	9,641,592	15.00	56.60	41.60	73.50%	7,086,570
1985	9,719,510	84.9	1.300	12,638,797	14.00	56.60	42.73	75.49%	9,541,028
1986	10,029,070	94.9	1.163	11,667,116	13.00	56.60	43.87	77.51%	9,043,182
1987	10,390,992	95.3	1.158	12,037,414	12.00	56.60	45.00	79.51%	9,570,948
1988	14,944,764	100.0	1.104	16,499,019	11.00	56.60	46.13	81.50%	13,446,701
1989	18,480,841	102.4	1.078	19,924,657	10.00	56.60	46.70	82.51%	16,439,834
1990	24,324,507	97.9	1.128	27,430,292	9.00	56.60	47.83	84.51%	23,181,340
1991	14,723,785	98.9	1.116	16,435,853	8.00	56.60	48.96	86.50%	14,217,013
1992	8,213,696	99.5	1.110	9,113,488	7.00	56.60	50.09	88.50%	8,065,437
1993	12,523,401	100.1	1.103	13,812,023	6.00	56.60	50.66	89.51%	12,363,142
1994	10,642,242	100.5	1.099	11,690,582	5.00	56.60	51.79	91.50%	10,696,883
1995	13,555,914	108.6	1.017	13,780,598	4.00	56.60	52.92	93.50%	12,884,859
1996	19,218,864	106.0	1.042	20,016,628	3.00	56.60	54.05	95.49%	19,113,878
1997	12,009,826	109.4	1.009	12,119,605	2.00	56.60	54.62	96.50%	11,695,419
1998	13,830,109	110.3	1.001	13,842,648	1.00	56.60	55.75	98.50%	13,635,008
1999	7,377,970	110.4	1.000	7,377,970	0.00	56.60	56.60	100.00%	7,377,970
	305,067,487		2.216	676,048,139				47.46%	320,878,928

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999
Summary - Agreement Survivor Curves

Year of Placing	Original Cost as of 12/31/1999	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 12/31/1999	Life Expectancy When New	Life Expectancy 12/31/1999	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
1925	43,987,924			293,745,357					209,329
1926	256,922			2,631,236					88,425
1927	188,282			2,074,414					231,610
1928	487,771			4,888,349					244,395
1929	586,102			5,399,880					290,066
1930	304,798			3,331,445					338,924
1931	27,397			342,062					76,447
1932	36,887			464,204					103,998
1933	145,104			1,546,063					108,805
1934	59,193			491,199					90,466
1935	66,984			870,398					247,689
1936	156,083			1,663,737					198,746
1937	135,594			1,283,383					291,363
1938	70,394			776,925					220,508
1939	88,777			960,401					247,062
1940	211,534			2,202,144					640,345
1941	402,839			3,529,527					710,535
1942	132,192			1,418,636					438,525
1943	147,828			1,357,678					239,113
1944	63,396			827,364					313,752
1945	176,516			2,267,892					808,174
1946	257,187			3,182,520					1,109,319
1947	1,451,202			12,459,720					2,101,113
1948	1,093,903			9,621,080					2,352,376
1949	1,116,321			9,710,337					3,018,481
1950	855,264			6,514,045					2,181,891
1951	1,065,496			8,170,348					2,638,036
1952	2,761,316			19,569,593					4,780,462
1953	2,273,129			14,805,080					4,271,207
1954	2,951,432			18,247,312					5,326,091
1955	6,029,468			30,592,467					6,992,637
1956	4,738,634			24,960,666					6,565,970
1957	6,162,649			32,249,826					9,152,135
1958	5,961,735			31,959,781					9,260,797
1959	7,520,856			40,582,244					12,179,503
1960	16,149,986			82,558,744					22,392,672
1961	8,981,896			43,788,905					11,580,061
1962	7,148,901			32,758,848					6,706,335
1963	9,430,617			42,008,426					8,369,703
1964	9,974,067			43,558,910					9,870,188
1965	8,603,014			34,597,902					6,696,509
1966	9,678,462			35,818,572					6,605,939
1967	9,131,261			31,783,541					5,574,713
1968	10,559,818			36,165,134					7,784,844
1969	19,006,403			58,881,036					11,423,551
1970	30,962,131			88,864,551					22,200,451
1971	33,375,466			88,136,960					22,756,781
1972	35,665,288			86,945,962					22,982,610
1973	55,565,801			129,561,555					37,685,097
1974	35,465,156			71,650,737					20,278,206
1975	22,403,216			42,758,636					13,963,334

U S West Communications - Arizona
Reproduction Cost New Less Depreciation
Telephone Plant in Service as of December 31, 1999
Summary - Agreement Survivor Curves

Year of Placing	Original Cost as of 12/31/1999	Telephone Plant Index	Telephone Plant Translator	Reproduction Cost New	Age as of 12/31/1999	Life Expectancy When New	Life Expectancy 12/31/1999	Condition Percent	Reproduction Cost New Less Depreciation
(A)	(B)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
1976	17,627,632			32,724,629					10,193,910
1977	26,785,079			45,622,001					12,465,539
1978	37,631,333			61,765,341					17,775,428
1979	48,987,063			73,588,579					24,538,695
1980	52,604,173			71,426,436					26,797,695
1981	58,417,462			75,409,307					29,883,666
1982	146,883,935			177,863,315					77,929,009
1983	111,939,830			129,172,210					57,523,108
1984	145,936,225			164,254,481					74,228,588
1985	195,180,965			215,530,539					103,159,855
1986	195,868,338			204,581,977					102,252,422
1987	194,939,664			208,792,559					104,468,131
1988	210,107,522			221,841,369					119,153,092
1989	224,135,891			212,024,480					117,863,902
1990	200,883,251			204,329,495					124,899,852
1991	195,984,861			198,177,768					124,767,642
1992	193,132,630			192,103,531					126,473,147
1993	199,240,341			199,121,546					138,736,781
1994	243,319,477			242,443,929					179,339,890
1995	317,853,397			318,200,272					252,125,526
1996	369,357,239			371,717,557					311,404,025
1997	297,002,388			301,204,592					266,354,102
1998	371,625,933			371,645,906					351,009,332
1999	419,399,791			419,399,791					419,399,376
	4,888,917,012			6,257,477,341					3,487,682,001

Appendix B

TELEPHONE PLANT INDEX
PREPARED BY JOEL POPKIN AND COMPANY

R·W·BECK

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1946	1947	1948	1949	1950	1951	1952	1953
BUILDINGS-(2121)	11.9	13.6	14.8	15.4	15.5	16.5	17.1	17.6
VEHICLES & OTHER WORK EQ-(2112&21	16.6	19.0	21.0	22.5	22.5	24.0	25.1	25.2
MOTOR VEHICLES (2112)	19.7	22.6	24.9	26.6	26.5	27.9	29.5	29.4
AIRCRAFT (2113)	–	–	–	–	–	–	–	–
GARAGE WORK EQUIPMENT (2115)	–	–	–	–	–	–	–	–
OTHER WORK EQUIPMENT (2116)	10.1	11.4	12.9	13.8	14.2	15.7	15.9	16.4
FURNITURE & OFFICE EQUIPMENT	29.9	32.8	34.4	34.9	36.2	39.9	39.3	39.5
FURNITURE (2122)	14.1	16.2	17.3	17.9	18.8	21.3	21.1	21.4
OTHER COMMUNICATIONS EQUIP-(2123	74.1	84.6	75.1	73.6	77.5	88.3	82.0	74.6
OFFICE SUPPORT EQUIPMENT (2123.1)	–	–	–	–	–	–	–	–
COMPUTER EQUIPMENT (2124)	61.0	71.3	72.3	69.2	71.3	73.8	66.2	58.3
GENERAL EQUIPMENT-(2112-2124)	23.6	26.6	28.9	30.4	30.8	33.2	34.1	34.2
COE-ELTN-ANLG (2211)	–	–	–	–	–	–	–	–
COE-ELTN-DGTL (2212)	–	–	–	–	–	–	–	–
ELECTROMECHANICAL (2215) (C)	–	–	–	–	–	–	–	–
COE-STEP BY STEP (2215.1)	22.5	26.2	26.4	25.6	26.7	27.6	26.0	24.7
COE-CROSSBAR (2215.2)	24.1	27.8	27.8	26.8	27.6	28.2	26.3	24.6
COE-OPERATOR SYSTEMS (2220)	–	–	–	–	–	–	–	–
COE-RADIC (2231)	33.3	37.7	39.1	38.8	39.9	41.3	38.0	35.2
COE-CIRCUIT-ANLG, DGTL, SPG (2232) (C	38.7	43.8	44.4	43.4	44.6	46.3	42.4	38.9
COE-ANLG CIRCUIT (2232.2)	–	–	–	–	–	–	–	–
COE-DIGITAL DATA SYSTEMS (2232.11)	–	–	–	–	–	–	–	–
COE-DIGITAL CIRCUIT (2232.13)	–	–	–	–	–	–	–	–
COE-DIGITAL SUB PAIR GAIN (2232.12)	–	–	–	–	–	–	–	–
COE-COMPOSITE (2211-2232)	34.4	39.6	40.2	39.5	40.9	42.1	39.3	36.8
STATION APPARATUS - (2311)	38.4	40.6	42.5	42.9	43.2	47.1	47.1	47.1
LARGE PBX (2341)	23.4	27.1	27.4	26.7	27.8	28.8	27.2	25.7
OTHER TERMINAL EQUIPMENT (2362)	–	–	–	–	–	–	–	–
PUBLIC TELEPHONES (2351)	10.9	12.7	14.6	15.5	15.7	17.1	16.7	16.2
STATION COMPOSITE (2311-2351)	28.3	32.0	31.8	31.7	32.2	34.7	34.0	33.1
INSIDE PLANT	31.0	35.4	35.6	35.1	36.1	38.0	36.4	34.8

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1946	1947	1948	1949	1950	1951	1952	1953
AERIAL CABLE (2421)	20.6	22.1	23.7	25.2	24.6	25.8	26.1	26.1
UG CABLE (2422)	19.5	25.8	27.3	27.8	26.2	29.9	30.2	30.1
BURIED CABLE (2423)	26.2	28.0	29.8	31.8	31.0	32.4	32.9	33.2
SUBMARINE CABLE (2424)	26.2	29.5	31.4	33.4	31.6	34.2	34.4	34.2
INTRABLDG NW CABLE (2426)	–	–	–	–	–	–	–	–
CABLE COMPOSITE-(242*)	22.2	25.1	26.8	28.2	27.2	29.3	29.6	29.6
AERIAL WIRE (2431)	16.4	20.1	21.0	20.8	21.4	23.1	24.1	25.6
CABLE & WIRE-(242*-2431)	21.9	25.0	26.6	27.9	27.1	29.1	29.5	29.7
POLE LINES (2411)	12.1	14.3	14.7	14.5	14.7	15.7	16.6	17.2
U.G. CONDUIT (2441)	10.4	11.8	12.7	13.3	13.6	14.3	15.0	15.7
OSP STRUCTURES-(2411 & 2441)	11.3	13.2	13.7	13.7	14.0	14.9	15.7	16.3
OUTSIDE PLANT-(2411-2441)	19.5	22.4	23.7	24.5	24.1	25.8	26.4	26.9
ALL ACCOUNTS	25.7	29.4	30.1	30.3	30.7	32.5	31.9	31.3

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1954	1955	1956	1957	1958	1959	1960	1961
BUILDINGS-(2121)	18.0	18.6	19.7	20.2	20.7	21.1	21.2	21.3
VEHICLES & OTHER WORK EQ-(2112&21	25.4	26.2	27.8	29.2	30.2	31.0	30.8	30.8
MOTOR VEHICLES (2112)	29.5	30.3	32.1	33.5	34.5	35.3	34.8	34.7
AIRCRAFT (2113)	–	–	–	–	–	–	–	–
GARAGE WORK EQUIPMENT (2115)	–	–	–	–	–	–	–	–
OTHER WORK EQUIPMENT (2116)	16.7	17.4	18.9	20.3	21.1	21.9	22.3	22.7
FURNITURE & OFFICE EQUIPMENT	40.1	41.6	44.1	46.6	47.7	48.0	48.4	48.3
FURNITURE (2122)	21.7	22.6	24.3	25.8	26.5	26.6	26.9	26.8
OTHER COMMUNICATIONS EQUIP-(2123	74.6	67.1	62.8	62.6	60.6	60.6	56.3	56.3
OFFICE SUPPORT EQUIPMENT (2123.1)	–	–	–	–	–	–	–	–
COMPUTER EQUIPMENT (2124)	58.3	60.7	63.7	68.1	71.6	71.5	71.3	69.5
GENERAL EQUIPMENT-(2112-2124)	34.5	35.7	37.9	39.8	41.1	41.9	41.8	41.8
COE-ELTN-ANLG (2211)	–	–	–	–	–	–	–	–
COE-ELTN-DGTL (2212)	–	–	–	–	–	–	–	–
ELECTROMECHANICAL (2215) (C)	–	–	–	–	–	–	–	–
COE-STEP BY STEP (2215.1)	24.9	25.8	27.3	28.6	29.5	29.9	30.2	30.1
COE-CROSSBAR (2215.2)	24.7	25.3	26.3	27.8	28.5	28.1	27.7	27.0
COE-OPERATOR SYSTEMS (2220)	–	–	–	–	–	–	–	–
COE-RADIO (2231)	35.4	34.4	33.0	33.1	33.4	33.3	33.2	32.9
COE-CIRCUIT-ANLG, DGTL, SPG (2232) (C	39.3	39.2	39.8	41.4	42.3	41.5	40.6	40.4
COE-ANLG CIRCUIT (2232.2)	–	–	–	–	–	–	–	–
COE-DIGITAL DATA SYSTEMS (2232.11)	–	–	–	–	–	–	–	–
COE-DIGITAL CIRCUIT (2232.13)	–	–	–	–	–	–	–	–
COE-DIGITAL SUB PAIR GAIN (2232.12)	–	–	–	–	–	–	–	–
COE-COMPOSITE (2211-2232)	37.1	37.7	38.6	40.4	41.3	40.8	40.3	39.9
STATION APPARATUS - (2311)	47.1	51.2	56.8	56.8	62.0	62.6	61.3	59.4
LARGE PBX (2341)	26.0	26.9	28.4	29.8	30.7	31.2	31.7	31.8
OTHER TERMINAL EQUIPMENT (2362)	–	–	–	–	–	–	–	–
PUBLIC TELEPHONES (2351)	16.8	16.6	17.0	17.6	18.4	17.8	17.9	17.8
STATION COMPOSITE (2311-2351)	33.6	33.2	33.9	34.8	35.6	36.0	35.8	35.9
INSIDE PLANT	35.2	35.2	36.0	37.3	38.2	38.2	37.9	37.8

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1954	1955	1956	1957	1958	1959	1960	1961
AERIAL CABLE (2421)	26.4	26.1	27.5	27.3	27.4	28.1	27.9	27.7
UG CABLE (2422)	30.3	33.3	36.0	34.7	32.8	33.6	35.0	33.7
BURIED CABLE (2423)	33.7	33.3	35.2	34.6	34.7	35.7	34.7	33.7
SUBMARINE CABLE (2424)	34.5	35.1	37.6	36.0	35.0	35.9	35.8	34.8
INTRABLDG NW CABLE (2426)	–	–	–	–	–	–	–	–
CABLE COMPOSITE-(242*)	29.9	30.5	32.4	31.8	31.4	32.2	32.3	31.7
AERIAL WIRE (2431)	26.4	26.8	27.9	27.5	28.1	28.5	29.0	29.1
CABLE & WIRE-(242*-2431)	30.0	30.6	32.5	31.9	31.6	32.4	32.5	32.0
POLE LINES (2411)	17.0	16.8	17.9	19.1	19.3	19.8	20.2	20.3
U.G. CONDUIT (2441)	16.2	16.5	17.5	18.1	18.8	19.1	19.3	19.5
OSP STRUCTURES-(2411 & 2441)	16.3	16.3	17.3	18.2	18.6	19.0	19.3	19.5
OUTSIDE PLANT-(2411-2441)	27.1	27.5	29.2	29.0	28.9	29.6	29.8	29.4
ALL ACCOUNTS	31.6	31.9	33.1	33.8	34.4	34.7	34.6	34.4

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1962	1963	1964	1965	1966	1967	1968	1969
BUILDINGS-(2121)	21.5	22.0	22.7	23.4	24.3	25.5	26.8	28.5
VEHICLES & OTHER WORK EQ-(2112&21	30.8	30.7	31.0	31.3	31.6	32.2	33.4	34.2
MOTOR VEHICLES (2112)	34.7	34.4	34.6	34.7	34.7	35.2	36.2	36.9
AIRCRAFT (2113)	–	–	–	–	–	–	–	–
GARAGE WORK EQUIPMENT (2115)	–	–	–	–	–	–	–	–
OTHER WORK EQUIPMENT (2116)	22.7	23.1	23.7	24.3	25.1	26.0	27.5	28.7
FURNITURE & OFFICE EQUIPMENT	47.7	47.6	47.7	47.5	47.7	49.7	51.8	53.6
FURNITURE (2122)	26.9	27.0	27.1	27.2	27.8	29.2	30.3	31.5
OTHER COMMUNICATIONS EQUIP-(2123	56.4	56.4	56.4	55.8	55.7	56.5	60.1	65.3
OFFICE SUPPORT EQUIPMENT (2123.1)	–	–	–	–	–	–	–	–
COMPUTER EQUIPMENT (2124)	66.6	65.6	65.6	63.9	62.8	65.3	69.6	72.5
GENERAL EQUIPMENT-(2112-2124)	41.6	41.5	41.9	42.1	42.4	43.5	45.1	46.4
COE-ELTN-ANLG (2211)	–	–	–	–	–	–	70.9	74.0
COE-ELTN-DGTL (2212)	–	–	–	–	–	–	70.9	74.0
ELECTROMECHANICAL (2215) (C)	–	–	–	–	–	–	–	–
COE-STEP BY STEP (2215.1)	30.7	31.8	32.4	33.2	34.7	36.1	38.1	40.1
COE-CROSSBAR (2215.2)	26.9	27.3	27.5	27.2	27.8	29.2	31.1	32.5
COE-OPERATOR SYSTEMS (2220)	–	–	–	–	–	–	–	–
COE-RADIO (2231)	32.7	33.1	33.1	32.2	31.8	33.5	35.8	36.7
COE-CIRCUIT-ANLG, DGTL, SPG (2232) (C	39.6	39.8	39.8	38.7	38.3	39.0	40.4	41.5
COE-ANLG CIRCUIT (2232.2)	–	–	–	–	–	–	–	–
COE-DIGITAL DATA SYSTEMS (2232.11)	–	–	–	–	–	–	–	–
COE-DIGITAL CIRCUIT (2232.13)	–	–	–	–	–	–	–	–
COE-DIGITAL SUB PAIR GAIN (2232.12)	–	–	–	–	–	–	–	–
COE-COMPOSITE (2211-2232)	39.6	40.2	40.5	40.0	40.4	41.9	44.1	45.8
STATION APPARATUS - (2311)	55.1	54.3	54.3	52.5	49.1	49.2	50.3	53.9
LARGE PBX (2341)	31.8	32.3	33.3	34.2	35.3	36.5	38.4	40.6
OTHER TERMINAL EQUIPMENT (2362)	–	–	–	–	–	–	–	–
PUBLIC TELEPHONES (2351)	18.0	17.9	19.0	19.5	20.4	21.6	22.8	24.3
STATION COMPOSITE (2311-2351)	36.0	36.3	37.4	37.8	38.7	40.0	41.6	44.5
INSIDE PLANT	37.7	38.1	38.8	38.8	39.5	40.8	42.7	45.0

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988 = 100)

	1962	1963	1964	1965	1966	1967	1968	1969
AERIAL CABLE (2421)	27.8	28.0	28.3	28.6	30.3	31.2	32.8	34.4
UG CABLE (2422)	33.5	34.3	35.8	38.7	41.3	43.0	46.0	49.1
BURIED CABLE (2423)	33.5	33.4	33.1	33.3	35.5	36.7	38.7	40.3
SUBMARINE CABLE (2424)	34.6	34.8	35.2	36.5	39.1	40.4	42.8	44.9
INTRABLDG NW CABLE (2426)	–	–	–	–	–	–	–	–
CABLE COMPOSITE-(242*)	31.6	31.8	32.2	33.1	35.2	36.4	38.5	40.5
AERIAL WIRE (2431)	27.9	27.4	27.7	28.0	29.2	30.7	32.9	35.8
CABLE & WIRE-(242*-2431)	31.8	31.9	32.3	33.1	35.2	36.4	38.5	40.5
POLE LINES (2411)	20.4	20.8	21.5	22.2	23.4	24.6	25.9	27.4
U.G. CONDUIT (2441)	19.9	20.1	20.7	21.2	21.9	23.5	24.8	26.5
OSP STRUCTURES-(2411 & 2441)	19.7	20.0	20.6	21.3	22.1	23.6	24.8	26.4
OUTSIDE PLANT-(2411-2441)	29.4	29.6	30.1	30.9	32.7	34.0	36.0	38.0
ALL ACCOUNTS	34.4	34.7	35.3	35.6	36.6	38.0	39.9	42.0

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1970	1971	1972	1973	1974	1975	1976	1977
BUILDINGS-(2121)	31.1	33.8	36.7	39.4	45.1	50.9	54.2	58.0
VEHICLES & OTHER WORK EQ-(2112&21	35.5	37.5	38.7	39.4	43.6	50.0	53.4	56.9
MOTOR VEHICLES (2112)	38.2	40.4	41.5	41.9	45.4	50.8	54.1	57.6
AIRCRAFT (2113)	–	–	–	–	–	–	–	–
GARAGE WORK EQUIPMENT (2115)	–	–	–	–	–	–	–	–
OTHER WORK EQUIPMENT (2116)	30.0	31.6	32.7	34.0	39.6	48.2	51.7	55.6
FURNITURE & OFFICE EQUIPMENT	55.9	57.6	58.6	60.9	68.4	73.7	75.6	74.4
FURNITURE (2122)	33.4	34.5	35.1	37.8	44.5	48.7	50.6	54.3
OTHER COMMUNICATIONS EQUIP-(2123	66.4	68.8	70.5	64.9	64.2	64.8	68.2	71.7
OFFICE SUPPORT EQUIPMENT (2123.1)	–	–	–	–	–	–	–	–
COMPUTER EQUIPMENT (2124)	74.5	76.8	78.0	77.6	82.2	88.3	90.3	86.1
GENERAL EQUIPMENT-(2112-2124)	48.3	50.6	51.9	53.2	59.1	66.5	69.3	70.4
COE-ELTN-ANLG (2211)	76.3	79.3	81.2	81.1	85.1	91.4	94.7	92.4
COE-ELTN-DGTL (2212)	76.3	79.3	81.2	81.1	85.1	91.4	94.7	92.4
ELECTROMECHANICAL (2215) (C)	–	–	–	–	–	–	–	–
COE-STEP BY STEP (2215.1)	42.0	45.3	47.9	50.3	56.9	64.3	69.6	74.8
COE-CROSSBAR (2215.2)	34.2	36.5	37.8	39.7	45.0	51.0	55.3	59.4
COE-OPERATOR SYSTEMS (2220)	–	–	–	–	–	–	–	–
COE-RADIO (2231)	37.5	39.0	40.3	42.5	46.9	51.1	54.1	58.4
COE-CIRCUIT-ANLG, DGTL, SPG (2232) (C	42.6	44.4	45.6	47.7	53.0	57.5	59.8	61.1
COE-ANLG CIRCUIT (2232.2)	–	–	–	–	–	–	–	–
COE-DIGITAL DATA SYSTEMS (2232.11)	–	–	–	–	–	–	–	–
COE-DIGITAL CIRCUIT (2232.13)	–	–	–	–	–	–	–	–
COE-DIGITAL SUB PAIR GAIN (2232.12)	–	–	–	–	–	–	–	–
COE-COMPOSITE (2211-2232)	47.5	50.1	51.7	53.9	59.9	65.6	69.1	70.9
STATION APPARATUS - (2311)	56.2	58.8	62.5	63.3	67.3	70.2	76.4	76.9
LARGE PBX (2341)	43.0	46.9	50.0	52.0	57.6	64.4	68.9	72.8
OTHER TERMINAL EQUIPMENT (2362)	–	–	–	–	–	–	–	–
PUBLIC TELEPHONES (2351)	25.6	27.2	30.0	31.3	33.8	37.4	40.3	43.6
STATION COMPOSITE (2311-2351)	46.4	49.2	52.4	53.8	57.6	63.2	67.6	71.4
INSIDE PLANT	46.9	49.6	51.9	53.7	58.7	64.3	68.2	70.9

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1970	1971	1972	1973	1974	1975	1976	1977
AERIAL CABLE (2421)	38.2	40.3	43.2	45.0	50.9	54.7	58.6	62.2
UG CABLE (2422)	56.0	56.1	59.6	64.1	74.2	74.8	81.6	81.3
BURIED CABLE (2423)	45.5	46.8	49.9	52.0	60.0	62.8	67.7	69.5
SUBMARINE CABLE (2424)	50.9	51.8	55.0	57.9	66.9	68.7	74.0	74.9
INTRABLDG NW CABLE (2426)	–	–	–	–	–	–	–	–
CABLE COMPOSITE-(242*)	45.6	46.9	50.1	52.6	60.4	63.0	68.1	69.9
AERIAL WIRE (2431)	39.0	40.4	42.1	43.5	52.6	56.2	59.4	63.6
CABLE & WIRE-(242*-2431)	45.6	46.9	50.0	52.5	60.4	63.0	68.0	69.9
POLE LINES (2411)	29.4	32.9	34.9	37.9	48.9	52.4	55.7	59.2
U.G. CONDUIT (2441)	28.3	31.1	33.5	36.0	41.0	45.9	50.0	53.0
OSP STRUCTURES-(2411 & 2441)	28.3	31.2	33.5	36.0	42.1	46.7	50.6	53.7
OUTSIDE PLANT-(2411-2441)	42.3	44.1	47.1	49.8	57.4	60.8	65.6	67.8
ALL ACCOUNTS	44.6	47.1	49.7	51.8	57.6	62.8	66.9	69.6

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1978	1979	1980	1981	1982	1983	1984	1985
BUILDINGS-(2121)	62.8	67.7	74.3	81.3	87.3	90.1	91.2	92.6
VEHICLES & OTHER WORK EQ-(2112&21	61.5	66.8	73.9	83.5	88.7	90.7	92.3	94.2
MOTOR VEHICLES (2112)	61.9	66.9	73.4	83.6	88.4	90.4	92.0	94.0
AIRCRAFT (2113)	–	–	–	–	–	–	–	–
GARAGE WORK EQUIPMENT (2115)	–	–	–	–	–	–	–	–
OTHER WORK EQUIPMENT (2116)	60.5	66.5	75.2	83.4	89.4	91.5	92.8	94.6
FURNITURE & OFFICE EQUIPMENT	71.6	71.7	73.5	80.2	88.5	96.3	–	–
FURNITURE (2122)	58.8	64.7	68.9	75.2	80.4	83.7	86.8	90.1
OTHER COMMUNICATIONS EQUIP-(2123	74.7	78.3	81.1	88.4	98.0	102.7	94.4	85.3
OFFICE SUPPORT EQUIPMENT (2123.1)	–	–	–	–	–	–	–	–
COMPUTER EQUIPMENT (2124)	78.4	74.9	75.1	82.3	92.9	103.8	108.6	103.0
GENERAL EQUIPMENT-(2112-2124)	71.1	73.8	78.4	87.0	94.3	99.7	100.8	96.8
COE-ELTN-ANLG (2211)	87.4	86.2	87.8	95.4	106.9	118.3	129.8	118.1
COE-ELTN-DGTL (2212)	87.4	86.2	87.8	95.4	106.9	118.3	129.8	118.1
ELECTROMECHANICAL (2215) (C)	–	–	–	–	–	–	–	–
COE-STEP BY STEP (2215.1)	77.4	78.3	80.5	86.8	96.6	106.9	116.5	121.8
COE-CROSSBAR (2215.2)	61.3	61.8	63.4	68.4	76.3	84.4	92.2	92.9
COE-OPERATOR SYSTEMS (2220)	–	–	–	–	–	–	–	–
COE-RADIO (2231)	63.4	69.2	73.5	81.0	86.1	90.1	97.7	99.3
COE-CIRCUIT-ANLG, DGTL, SPG (2232) (C	61.3	62.8	64.2	69.9	75.4	83.4	87.6	97.0
COE-ANLG CIRCUIT (2232.2)	–	–	–	–	–	–	–	–
COE-DIGITAL DATA SYSTEMS (2232.11)	–	–	–	–	–	–	–	–
COE-DIGITAL CIRCUIT (2232.13)	–	–	–	–	–	–	–	–
COE-DIGITAL SUB PAIR GAIN (2232.12)	–	–	–	–	–	–	–	–
COE-COMPOSITE (2211-2232)	70.8	71.3	73.0	79.2	87.3	96.5	103.3	105.6
STATION APPARATUS - (2311)	75.1	75.9	79.4	85.7	94.3	99.4	92.7	85.4
LARGE PBX (2341)	73.0	72.0	76.0	83.6	86.4	90.7	94.1	98.7
OTHER TERMINAL EQUIPMENT (2362)	–	–	–	–	–	–	–	–
PUBLIC TELEPHONES (2351)	46.4	49.0	53.1	57.2	60.8	65.0	74.7	75.3
STATION COMPOSITE (2311-2351)	74.1	77.7	83.2	89.8	97.7	99.7	96.5	91.9
INSIDE PLANT	72.1	74.0	77.5	83.9	91.8	97.7	103.3	104.7

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988 = 100)

	1978	1979	1980	1981	1982	1983	1984	1985
AERIAL CABLE (2421)	64.8	72.7	81.1	86.8	91.7	95.8	97.9	96.2
UG CABLE (2422)	81.8	90.4	103.0	109.0	111.7	111.9	110.5	106.4
BURIED CABLE (2423)	70.4	78.6	88.2	95.1	98.6	100.0	100.9	99.0
SUBMARINE CABLE (2424)	75.1	84.6	95.8	101.5	104.6	104.6	105.2	103.2
INTRABLDG NW CABLE (2426)	–	–	–	–	–	–	–	–
CABLE COMPOSITE-(242*)	71.3	79.5	89.4	95.7	99.5	101.5	102.1	99.9
AERIAL WIRE (2431)	66.0	70.7	80.1	84.1	89.0	92.1	96.1	95.2
CABLE & WIRE-(242*-2431)	71.3	79.4	89.4	95.6	99.5	101.4	102.1	99.9
POLE LINES (2411)	62.7	69.8	78.3	85.6	91.3	95.3	100.0	99.7
U.G. CONDUIT (2441)	56.6	63.6	69.3	74.6	79.3	81.3	83.8	84.9
OSP STRUCTURES-(2411 & 2441)	57.2	64.2	70.4	76.0	80.8	83.2	86.1	86.9
OUTSIDE PLANT-(2411-2441)	69.7	77.9	87.1	93.4	97.6	99.7	100.5	98.6
ALL ACCOUNTS	71.3	75.2	80.6	87.1	94.0	98.6	101.7	101.1

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1986	1987	1988	1989	1990	1991	1992	1993
BUILDINGS-(2121)	96.1	97.4	100.0	100.5	102.9	105.6	108.9	116.8
VEHICLES & OTHER WORK EQ-(2112&21	96.1	98.3	100.0	–	–	–	–	–
MOTOR VEHICLES (2112)	96.5	98.8	100.0	102.7	104.5	108.0	110.4	113.2
AIRCRAFT (2113)	–	–	100.0	104.1	110.3	117.7	122.9	125.8
GARAGE WORK EQUIPMENT (2115)	–	–	100.0	105.7	112.1	118.0	122.4	124.7
OTHER WORK EQUIPMENT (2116)	95.4	97.4	100.0	104.8	108.8	112.0	115.1	118.1
FURNITURE & OFFICE EQUIPMENT	–	–	–	–	–	–	–	–
FURNITURE (2122)	92.9	95.5	100.0	103.9	107.4	109.7	111.2	113.1
OTHER COMMUNICATIONS EQUIP-(2123	86.8	86.7	100.0	111.0	114.5	114.8	100.7	96.7
OFFICE SUPPORT EQUIPMENT (2123.1)	–	–	100.0	102.3	102.3	102.6	103.7	103.7
COMPUTER EQUIPMENT (2124)	101.1	98.9	100.0	99.9	95.8	79.4	66.6	58.4
GENERAL EQUIPMENT-(2112-2124)	96.5	95.8	100.0	102.2	99.6	87.4	77.1	69.4
COE-ELTN-ANLG (2211)	109.6	105.9	100.0	98.9	95.4	92.3	92.0	96.0
COE-ELTN-DGTL (2212)	109.6	105.9	100.0	100.5	106.5	106.4	109.9	113.1
ELECTROMECHANICAL (2215) (C)	–	–	100.0	101.0	98.5	96.1	96.7	101.4
COE-STEP BY STEP (2215.1)	100.7	97.6	100.0	101.0	98.5	96.1	96.7	101.5
COE-CROSSBAR (2215.2)	101.5	98.6	100.0	101.0	98.6	96.0	96.5	100.5
COE-OPERATOR SYSTEMS (2220)	–	–	100.0	101.3	104.4	104.2	104.0	102.9
COE-RADIO (2231)	98.8	97.3	100.0	101.4	103.6	106.1	105.6	107.5
COE-CIRCUIT-ANLG, DGTL, SPG (2232) (C	101.8	100.2	100.0	100.0	98.6	99.6	96.4	94.0
COE-ANLG CIRCUIT (2232.2)	–	–	100.0	103.7	103.3	106.5	108.2	109.7
COE-DIGITAL DATA SYSTEMS (2232.11)	–	–	100.0	98.8	99.0	100.3	92.2	90.6
COE-DIGITAL CIRCUIT (2232.13)	–	–	100.0	99.1	98.2	99.6	94.7	91.2
COE-DIGITAL SUB PAIR GAIN (2232.12)	–	–	100.0	100.1	97.5	97.4	95.8	94.0
COE-COMPOSITE (2211-2232)	104.7	102.2	100.0	100.2	101.2	101.1	100.9	101.1
STATION APPARATUS - (2311)	85.4	85.3	100.0	111.6	115.3	115.0	97.4	92.7
LARGE PBX (2341)	101.6	100.5	100.0	98.4	98.1	98.1	99.3	98.5
OTHER TERMINAL EQUIPMENT (2362)	–	–	100.0	98.7	99.0	99.8	102.4	106.7
PUBLIC TELEPHONES (2351)	82.2	89.7	100.0	98.5	95.5	96.7	101.7	90.7
STATION COMPOSITE (2311-2351)	95.5	96.6	100.0	98.6	98.7	99.4	100.1	99.1
INSIDE PLANT	104.1	101.8	100.0	100.2	101.1	101.1	101.0	101.1

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1986	1987	1988	1989	1990	1991	1992	1993
AERIAL CABLE (2421)	97.3	97.9	100.0	106.5	109.4	111.2	113.6	114.9
UG CABLE (2422)	105.0	101.1	100.0	108.5	107.6	107.4	107.0	96.9
BURIED CABLE (2423)	100.6	98.8	100.0	105.2	105.2	106.8	109.4	107.4
SUBMARINE CABLE (2424)	101.9	99.3	100.0	106.2	106.5	109.3	112.4	117.0
INTRABLDG NW CABLE (2426)	–	–	100.0	105.4	106.9	108.1	110.3	108.8
CABLE COMPOSITE-(242*)	100.8	99.1	100.0	106.0	105.9	107.1	109.0	105.5
AERIAL WIRE (2431)	92.8	95.9	100.0	107.0	109.8	109.4	111.5	114.0
CABLE & WIRE-(242*-2431)	100.8	99.1	100.0	106.0	106.2	107.4	109.3	105.8
POLE LINES (2411)	99.8	98.4	100.0	103.5	110.5	116.3	121.7	128.5
U.G. CONDUIT (2441)	94.9	95.3	100.0	102.4	97.9	98.9	99.5	100.1
OSP STRUCTURES-(2411 & 2441)	95.6	95.7	100.0	102.4	99.1	100.5	101.5	105.0
OUTSIDE PLANT-(2411-2441)	100.3	98.7	100.0	105.6	105.3	106.5	108.3	105.5
ALL ACCOUNTS	101.4	99.8	100.0	102.0	102.1	100.5	99.3	96.8

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1994	1995	1996	1997	1998	1/99
BUILDINGS-(2121)	117.8	123.2	127.0	127.7	128.4	130.0
VEHICLES & OTHER WORK EQ-(2112&21	–	–	–	–	–	–
MOTOR VEHICLES (2112)	116.2	117.6	118.6	117.3	116.2	116.7
AIRCRAFT (2113)	129.6	135.4	141.0	143.5	143.7	144.4
GARAGE WORK EQUIPMENT (2115)	128.1	132.0	135.1	136.5	138.1	138.0
OTHER WORK EQUIPMENT (2116)	119.6	122.3	125.0	127.2	129.8	130.8
FURNITURE & OFFICE EQUIPMENT	–	–	–	–	–	–
FURNITURE (2122)	116.5	119.3	122.1	124.2	125.0	125.4
OTHER COMMUNICATIONS EQUIP-(2123	83.0	80.0	69.1	68.1	66.8	66.4
OFFICE SUPPORT EQUIPMENT (2123.1)	104.0	104.2	104.7	105.0	105.0	104.6
COMPUTER EQUIPMENT (2124)	53.7	48.1	40.4	32.6	24.3	21.6
GENERAL EQUIPMENT-(2112-2124)	64.7	59.3	51.3	43.3	34.7	31.9
COE-ELTN-ANLG (2211)	93.5	102.7	105.3	109.6	123.2	124.4
COE-ELTN-DGTL (2212)	116.0	117.2	113.6	112.5	109.9	109.7
ELECTROMECHANICAL (2215) (C)	100.6	108.2	–	–	–	–
COE-STEP BY STEP (2215.1)	100.8	108.3	–	–	–	–
COE-CROSSBAR (2215.2)	98.1	107.4	–	–	–	–
COE-OPERATOR SYSTEMS (2220)	106.7	105.1	107.5	107.4	107.0	106.7
COE-RADIO (2231)	106.4	101.2	100.2	94.7	95.4	95.5
COE-CIRCUIT-ANLG, DGTL, SPG (2232) (C	93.6	92.9	94.5	91.7	94.4	94.7
COE-ANLG CIRCUIT (2232.2)	111.8	111.8	111.6	111.9	109.8	110.4
COE-DIGITAL DATA SYSTEMS (2232.11)	89.4	86.9	87.2	87.1	86.8	86.8
COE-DIGITAL CIRCUIT (2232.13)	88.8	86.2	86.9	84.5	88.1	88.4
COE-DIGITAL SUB PAIR GAIN (2232.12)	95.3	96.1	98.4	95.3	97.3	97.7
COE-COMPOSITE (2211-2232)	101.9	102.5	102.4	100.1	101.3	101.6
STATION APPARATUS - (2311)	77.9	74.7	62.7	61.3	59.8	59.0
LARGE PBX (2341)	98.4	98.7	–	–	–	–
OTHER TERMINAL EQUIPMENT (2362)	110.3	111.0	110.4	109.3	108.1	108.7
PUBLIC TELEPHONES (2351)	89.5	88.7	87.7	90.0	88.0	87.6
STATION COMPOSITE (2311-2351)	100.9	101.0	100.2	100.2	98.8	99.0
INSIDE PLANT	101.9	102.5	102.3	100.2	101.3	101.5

USWEST TELEPHONE PLANT INDEXES
INDEX COMPOSITES (1988=100)

	1994	1995	1996	1997	1998	1/99
AERIAL CABLE (2421)	117.9	127.3	127.2	129.5	130.1	130.7
UG CABLE (2422)	93.0	100.7	99.5	99.0	95.9	94.9
BURIED CABLE (2423)	110.0	122.1	121.3	123.6	123.5	123.7
SUBMARINE CABLE (2424)	122.2	127.1	–	–	–	–
INTRABLDG NW CABLE (2426)	111.7	118.4	119.0	122.1	121.2	122.1
CABLE COMPOSITE-(242*)	106.6	117.5	116.7	118.5	117.9	117.9
AERIAL WIRE (2431)	117.5	126.5	127.2	130.1	131.5	132.6
CABLE & WIRE-(242*-2431)	106.9	117.8	117.1	118.8	118.2	118.2
POLE LINES (2411)	139.2	146.0	151.2	158.8	165.4	167.0
U.G. CONDUIT (2441)	100.5	108.6	106.0	109.4	110.3	110.4
OSP STRUCTURES-(2411 & 2441)	110.0	116.9	114.4	118.2	119.5	119.6
OUTSIDE PLANT-(2411-2441)	106.6	117.1	116.1	118.2	117.8	117.8
ALL ACCOUNTS	96.4	98.4	96.3	94.3	92.8	92.3

Appendix C
DEPRECIATION PARAMETERS

R·W·BECK

Arizona Corporation Commissio
Docket No. T-1051B-99-10
U S WEST Communications – NHH-
Supp. Exhibit of Nancy Heller Hughe
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SUMMARY OF DEPRECIATION RATES
ALL VINTAGE RECOVERY

ACCOUNT NUMBER	CLASS OR SUBCLASS OF PLANT	DEPRECIATION RATES IN EFFECT 12/31/1996 REM LIFE YEARS	RESERVE %	FUTURE SALVAGE %	NET RATE %	RATES EFFECTIVE IN 1997 REM LIFE YEARS	RESERVE %	FUTURE SALVAGE %	NET RATE %
		A	B	C	D	E	F	G	H
2112	MOTOR VEHICLES	3.9	41.0	18.0	10.5	3.6	66.4	16.0	4.9
2114	SPEC PURPOSE VEHICLE	8.4	24.0	23.0	5.9	9.8	0.0	0.0	10.2
2115	GARAGE WORK EQUIP	9.0	16.9	23.0	6.7	10.2	-55.1	-4.0	15.6
2116	OTHER WORK EQUIP	8.4	27.7	23.0	5.9	5.4	7.2	7.0	15.9
2121	BUILDINGS	28.0	15.4	-10.0	3.4	26.0	29.2	-6.0	3.0
2122	FURNITURE	10.1	20.4	3.0	7.6	5.5	-10.8	0.0	20.1
2123.1	OFFICE EQUIPMENT	7.1	28.8	5.0	9.3	3.3	26.3	0.0	22.3
2123.2	COMPANY COMM EQUIP	3.3	62.1	1.0	11.2	5.3	67.7	0.0	6.1
2124	GEN PURPOSE CMPTR	3.0	42.9	5.0	17.4	2.4	72.4	5.0	9.4
2211	ANALOG SW EQUIP	8.4	34.7	2.0	7.5	3.4	44.8	0.0	16.2
2212	DIGITAL SW EQUIP	10.4	16.3	3.0	7.8	5.4	37.5	3.0	11.0
2220	OPERATOR SYSTEMS	1.4	4.1	3.0	66.4	4.1	96.6	-3.0	1.6
2231	RADIO SYSTEMS	8.1	34.5	-8.0	9.1	6.6	64.0	-2.0	5.8
2232	CIRCUIT EQUIP								
	CIRCUIT DDS	4.0	50.5	-4.0	13.4	4.0	75.4	3.0	5.4
	CIRCUIT DIGITAL	7.9	27.8	3.0	8.8	5.1	47.8	2.0	9.8
	CIRCUIT ANALOG	5.0	39.1	3.0	11.6	3.3	89.3	0.0	3.2
2351	PUB TEL TERM EQUIP	2.7	94.6	1.0	1.6	3.6	77.8	30.0	0.0
2362	OTHER TERM EQUIP	4.7	45.9	3.0	10.9	6.4	49.9	2.0	7.5
2411	POLE LINES	15.6	55.9	-49.0	6.0	26.0	71.6	-138.0	6.4
2421	AERIAL CABLE MET	9.3	27.3	-23.0	10.3	5.2	61.5	-27.0	12.6
2421	AERIAL CABLE NON MET	15.5	4.0	-27.0	7.9	13.1	12.5	-27.0	8.7
2422	UNDGRD CABLE MET	13.8	24.9	-9.0	6.1	5.8	50.8	-6.0	9.5
2422	UNDGRD CABLE NON MET	18.7	7.8	-21.0	6.1	7.7	26.5	-6.0	10.3
2423	BURIED CABLE MET	14.8	25.7	-2.0	5.2	5.6	40.0	-7.0	12.0
2423	BURIED CABLE NON MET	20.0	10.0	-9.0	5.0	12.9	24.8	-7.0	6.4
2424	SUB CABLE MET	22.0	-80.9	0.0	8.2	1.4	-20.6	0.0	86.1
2424	SUB CABLE NON MET	13.9	36.8	0.0	14.0	0.0	0.0	0.0	0.0
2426	INTRA BLDG CA MET	14.1	53.1	-12.0	4.2	8.3	70.7	0.0	3.5
2426	INTRA BLDG NON MET	12.5	-14.0	-33.0	11.8	6.1	20.2	0.0	13.1
2431	AERIAL WIRE	12.0	12.2	-32.0	10.0	5.5	16.8	-30.0	20.6
2441	CONDUIT SYSTEMS	47.0	16.2	-11.0	2.0	44.0	21.1	-20.0	2.2

PARAMETER REPORT

COMMISSION DECISION 4/25/00

CATEGORY	FIRST ELG YEAR	P.L. OR AYFR	AVG. NET SALV.	FUTURE NET SALV.	CURVE SHAPE PARAMETERS c	G	S	COMMENTS
2112 MOTOR VEHICLES			15	16				
2112 PASSENGER CARS	1983	8.6	15.4	16.0	IOWA CURVE L3.0			
2112 LIGHT TRUCKS	1983	8.6	15.4	16.0	IOWA CURVE L3.0			
2112 HEAVY TRUCKS	1983	8.6	15.4	16.0	IOWA CURVE L3.0			
2114 SPEC PURPOSE VEHICLES	0	16.1	0	0	IOWA CURVE S6.0			
2115 GARAGE WORK EQUIP	0	13.7	-24	-4	IOWA CURVE L0.0			
2116 OTHER WORK EQUIP	0	11.5	9	7	IOWA CURVE L4.0			
2121 BUILDINGS			2	-6				
2121 LARGE BUILDINGS	1983	43.0	2.0	-6.0	IOWA CURVE R1.0			
2121 OTHER BUILDINGS	1983	43.0	2.0	-6.0	IOWA CURVE R1.0			
2122 FURNITURE	1983	9.5	3	0	IOWA CURVE O4.0			
2123.1 OFFICE EQUIPMENT	1983	7.0	0	0	IOWA CURVE L0.5			
2123.2 COMPANY COMM EQUIP			0	0				
2123.2 STAND ALONE	0	8.3	-0.1	0.0	IOWA CURVE L0.5			
2123.2 PBX & KEY INTRASYSTEMS	0	8.3	-0.1	0.0	IOWA CURVE L0.5			
2124 GEN PURPOSE CMPTR	1983	5.0	6	5	IOWA CURVE O1.0			
2211 ANALOG SW EQUIP	0	2000.0	6	0	CONSTANT RETIREMENT RATE		1.5	
2212 DIGITAL SW EQUIP	1983	10.0	3	3	IOWA CURVE O1.0			
2220 OPERATOR SYSTEMS	1983	10.7	-3	-3	IOWA CURVE S2.0			
2231 RADIO SYSTEMS	1983	15.1	-1	-2	IOWA CURVE S1.5			
2232 CIRCUIT DDS	1983	8.1	8	3	IOWA CURVE L1.0			
2232 CIRCUIT DIGITAL	1983	10.0	2	2	IOWA CURVE O2.0			
2232 CIRCUIT ANALOG	1983	8.0	-1	0	IOWA CURVE L0.0			
2351 PUB TEL TERM EQUIP	0	7.9	30	30	IOWA CURVE S6.0			
2362 OTHER TERM EQUIP	0	6.8	8	2	IOWA CURVE O3.0			
2411 POLE LINES	1982	46.4	-86	-138	IOWA CURVE O1.0			
2421 AERIAL CABLE MET	1982	12.0	-21	-27	IOWA CURVE R1.0			
2421 AERIAL CABLE NON MET	1982	14.5	-27	-27	IOWA CURVE SQ			
2422 UNDGRD CABLE MET	1982	15.0	-6	-6	IOWA CURVE R1.5			
2422 UNDGRD CABLE NON MET	1982	13.1	-6	-6	IOWA CURVE SQ			
2423 BURIED CABLE MET	1982	12.0	-7	-7	IOWA CURVE L1.5			
2423 BURIED CABLE NON MET	1982	17.6	-7	-7	IOWA CURVE SQ			
2424 SUB CABLE MET	1982	15.0	0	0	IOWA CURVE SQ			
2424 SUB CABLE NON MET	1982	9.0	0	0	IOWA CURVE SQ			
2426 INTRA BLDG CA MET	1982	19.0	2	0	IOWA CURVE L2.0			
2426 INTRA BLDG CABLE NON MET	1982	11.5	0	0	IOWA CURVE O1.0			
2431 AERIAL WIRE	0	8.9	-25	-30	IOWA CURVE L0.0			
2441 CONDUIT SYSTEMS	1982	56.6	-20	-20	IOWA CURVE SQ			

BEFORE THE ARIZONA CORPORATION COMMISSION

EXHIBIT
Q-22
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-01051B-99-0105

REBUTTAL TESTIMONY

OF

PETER C. CUMMINGS

QWEST CORPORATION

August 21, 2000

REBUTTAL TESTIMONY OF PETER C. CUMMINGS
INDEX OF TESTIMONY

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II. APPENDIX I ARITHMETIC AND GEOMETRIC MEANS

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APPENDIX EXHIBIT 3	S&P 500 Share Turnover Data
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III. EXHIBITS

	Exhibit
Industry Group Betas	PCC-01
DCF Cost of Equity Capital	PCC-02

EXECUTIVE SUMMARY

1. Current Responsibilities:

My name is Peter C. Cummings and my business address is 1600 Bell Plaza, Room 3005, Seattle, Washington 98191. I am employed by Qwest Corporation (Qwest) as Director - Finance and Economic Analysis.

My job responsibilities include financial analysis of capital costs and capital structure of Qwest Corporation. I develop cost of capital estimates for company cost studies, capital budgeting, and economic analysis. I also testify in state rate cases, cost dockets, and other regulatory proceedings on rate of return, capital structure, and other financial issues.

2. Purpose of Testimony:

I am appearing before the Corporation Commission to present rebuttal testimony related to cost of capital and capital structure for Qwest Corporation (Qwest), formerly U S WEST Communications, Inc. (USWC). The purpose of my rebuttal testimony is to comment on the testimony filed by Charles W. King on

behalf of The United States Department of Defense and Federal Executive Agencies, by Stephen G. Hill on behalf of the Arizona Corporation Commission Staff, and John B. Legler on behalf of the Residential Utility Consumer Office.

3. Summary of Testimony:

All parties have accepted the company's updated capital structure of 47.6% debt and 52.4% equity and embedded cost of debt of 7.39% as shown in my supplemental direct testimony.

Mr. King has underestimated the required return on equity investment for Qwest corporation for three reasons – an error in DCF model estimates for the risk comparable telephone group, reliance upon the DCF estimate for pre-merger U S WEST, Inc., and reliance upon an electric utility company group that is not risk comparable to Qwest. When corrected for the Verizon dividend error, Mr. King's DCF analysis of the three largest telephone companies provides a reasonable estimate of the required equity return for Qwest – the range of 12.73% to 15.18% with a midpoint of 14.12%.

Mr. Hill has underestimated Qwest's cost of equity capital, principally by his assumption that Qwest's cost of equity range is bounded by the cost of equity for gas distribution companies at the lower end and by its peer group of large telcos at

the upper end. There are three areas where Mr. Hill's cost of equity estimation methodology significantly departs from accepted financial theory and practice – using distorted capital market data for pre-merger U S WEST in his analysis, adjustments to expected growth rate inputs to DCF models, and implementation of the Capital Asset Pricing Model. Correction of these methodological issues would result in a range of equity cost estimates of 13.66% to 14.43%.

Dr. Legler presents financial models with cost of equity estimates ranging from less than 7% to nearly 20%. From this data, Dr. Legler concludes that the cost of equity capital for Qwest is in the range of 11.0% to 12.0%. My overall conclusion is that Dr. Legler's recommendation on the cost of equity capital for Qwest is primarily based upon his own opinion and not upon capital market data and financial models. To accept Dr. Legler's recommendation, one would have to have more confidence in Dr. Legler's opinion than in financial models and capital market data.

4. Conclusion and Recommendation

I believe the testimony presented by Mr. King, Dr. Legler, and Mr. Hill underestimates the cost of equity capital for Qwest corporation. My recommended range for a fair return on equity capital invested to provide telephone service in Arizona is the range of cost of equity estimates of 13.5% to 14.5% and my specific

recommendation for the Commission allowed return on equity is the midpoint of the range, 14.0%.

Combining the fair return on book equity range and Qwest's capital structure and embedded debt cost, my recommendation for a fair overall return on rate base is the range of 10.59% to 11.12% with a midpoint recommendation of 10.86% which is calculated as follows:

	Percent	Cost	Weighted Cost
Debt	47.6%	7.39%	3.52%
Equity	52.4%	14.0%	7.34%
Overall Return			10.86%

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT POSITION.

A. My name is Peter C. Cummings and my business address is 1600 Bell Plaza, Room 3005, Seattle, Washington 98191. I am employed by Qwest Corporation (Qwest) as Director - Finance and Economic Analysis.

Q. ARE YOU THE SAME PETER C. CUMMINGS THAT FILED DIRECT TESTIMONY IN THIS DOCKET?

A. Yes, I am. My work experience and qualifications are described in that testimony.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to comment on the testimony filed by Charles W. King on behalf of the United States Department of Defense and Federal Executive Agencies, by Stephen G. Hill on behalf of the Arizona Corporation Commission Staff, and John B. Legler on behalf of the Residential Utility Consumer Office.

CAPITAL STRUCTURE AND COST OF DEBT

Q. WHAT ARE THE INTERVENING PARTIES POSITIONS ON THE APPROPRIATE CAPITAL STRUCTURE AND COST OF DEBT FOR QWEST'S ARIZONA OPERATIONS?

A. Mr. King on behalf of DOD and Federal Executive Agencies, Dr. Legler on behalf of the Residential Utility Consumer Office, and Mr. Hill on behalf of the Arizona Corporation Commission Staff all accept the company's updated capital structure of 47.6% debt and 52.4% equity and embedded cost of debt of 7.39% as shown in my supplemental direct testimony.

Q. WHAT ARE THE REMAINING ISSUES RELATED TO COST OF CAPITAL?

A. The only remaining issue is estimation of the cost of equity capital.

COMMENT ON THE TESTIMONY OF CHARLES W. KING

Q. WHAT IS MR KING'S ESTIMATE OF THE COST OF EQUITY CAPITAL?

A. Mr. King estimates the cost of equity capital for Qwest Corporation at 11.5%.

Q. IS 11.5% A REASONABLE ESTIMATE OF INVESTOR EXPECTATIONS FOR COMMITMENT OF EQUITY CAPITAL TO PROVIDE PLANT AND EQUIPMENT TO PROVIDE TELEPHONE SERVICES?

A. No. I believe that Mr. King has seriously underestimated the cost of equity capital investment through his choice of financial modeling techniques, selection of proxy companies for analysis, and interpretation of capital market data.

Q. WHAT DOES MR. KING SAY ABOUT THE HOPE NATURAL GAS DECISION STANDARD THAT, "THE RETURN TO THE EQUITY OWNER SHOULD BE COMMENSURATE WITH THE RETURNS ON INVESTMENTS IN OTHER ENTERPRISES HAVING CORRESPONDING RISKS?"

A. Mr. King says, "Thus, if "return" is defined as the earnings of an equity investment relative to its current market price, then the comparable earnings test becomes a cipher. All returns are comparable with all other returns."

Q. ARE ALL RETURNS REALLY COMPARABLE WITH ALL OTHER RETURNS?

A. Absolutely not. What Mr. King has defined above is an earnings/price ratio. It is obvious that the ratio of earnings and price (more often expressed as

1 price/earnings ratio) varies widely among companies. This can be easily
2 verified by casual inspection of the daily stock listings in most newspapers.
3
4 **Q. DO YOU AGREE WITH MR. KING THAT "IF US WEST [QWEST] CAN**
5 **EARN A RETURN ON ITS INVESTMENT COMPARABLE TO THAT**
6 **REQUIRED BY ITS OWN SHAREHOLDERS AND BY SHAREHOLDERS**
7 **OF COMPANIES OF COMPARABLE RISK, THEN IT SHOULD HAVE NO**
8 **DIFFICULTY IN ATTRACTING AND MAINTAINING CREDIT?"**
9 A. Yes. Mr. King is correctly defining the cost of equity capital as an opportunity
10 cost -- the return required by investors for alternative investments of
11 equivalent risk. Mr. King goes on to say that , "Investors would have no
12 reason to shun U S WEST in favor of other investment opportunities."
13
14 **Q. WHAT ARE ALTERNATIVE INVESTMENTS OF EQUIVALENT RISK?**
15 A. As explained in my direct testimony, today's capital markets provide a myriad
16 of investment alternatives to the investor. The cost of capital is the
17 opportunity cost of foregoing the next best alternative investment. I agree
18 with Mr. King that the companies most comparable to Qwest Corporation are
19 telephone companies in the same business of providing local exchange,
20 intraLATA toll and toll access services. Where Mr. King and I disagree is in
21 the selection of other companies of comparable risk.

Q. ARE ELECTRIC UTILITIES COMPARABLE IN RISK TO QWEST CORPORATION?

A. Mr. King has made an assumption, unsupported by any data, that the electric utility industry is risk comparable to Qwest. Mr. King's rationale is simply that they, "are traditional regulated utilities with geographically defined franchise areas that are now experiencing growing competition and considerable industry restructuring."

There are some electric utility companies included in my analysis of comparable risk companies based on the criteria of bond ratings and cash flow variability. Also included in that group are non-regulated companies which have similar risk measures. Mr. King dismisses the quantitative measures of risk and says that only the electric utility companies are risk comparable to Qwest and that the non-regulated companies are not risk comparable. It is my conclusion that, taken as a whole, the entire group or portfolio of comparable companies presented in my testimony is risk comparable to Qwest and that picking out only the companies with the lowest equity cost model results, as Mr. King has done, biases the result. Picking out only the higher equity cost model results (such as the medical products companies) would be equally as wrong.

Q. WHAT METHOD DOES MR. KING USE TO ESTIMATE THE MARKET DETERMINED RATE OF RETURN ON EQUITY CAPITAL INVESTMENT IN QWEST'S ARIZONA OPERATIONS?

A. Mr. King places primary reliance upon a Discounted Cash Flow "DCF" procedure and then considers the Capital Asset Pricing Model to measure the relative riskiness of different companies.

Q. WHAT ARE THE RESULTS OF MR. KING'S DCF ANALYSIS?

A. Mr. King provides a DCF estimate for pre-merger U S WEST of 10.22%, estimates for Bell Companies (Verizon, BellSouth, and SBC) of 12.01% to 15.18%, averaging 13.31%, and estimates of 34 electric utility companies ranging from 9.06% to 14.83%, and averaging 11.53%.

Q. WHAT COMPANIES DOES MR. KING CONSIDER TO BE MOST RISK COMPARABLE TO QWEST [U S WEST] IN ARIZONA?

A. Mr. King says that the most comparable companies are the Regional Bell Holding Companies and GTE. This group of companies now consists of Verizon, BellSouth, and SBC. Mr. King's DCF estimate of the cost of equity capital for this group is 13.31%.

Q. DID MR. KING MAKE ANY ERRORS IN HIS DCF ANALYSIS OF THIS GROUP OF COMPANIES?

A. Yes. Mr. King has seriously underestimated the dividend yield for Verizon, the new company formed by the merger of Bell Atlantic and GTE. Mr. King shows next years dividend at $0.20 and the dividend yield at 0.36%. Prior to their merger on June 30, 2000, Bell Atlantic paid an annual dividend of $1.54 and GTE paid an annual dividend of $1.88. The combined company has indicated an annual dividend of $1.54 going forward. Correcting Mr. King's Table 1 on page 16 of his testimony would show next years dividend of $1.54, a dividend yield of 2.81% and a DCF return of 14.46%.

Q. WITH THIS CORRECTION, WHAT ARE THE DCF ESTIMATES FOR THE TELEPHONE COMPANIES?

A. The corrected results are as follows:

Verizon	14.46%
BellSouth	12.73%
SBC	15.18%

The three company average is 14.12%.

Q. PLEASE COMMENT ON MR. KING'S INCLUSION OF "CLASSIC" DCF RETURN FOR U S WEST IN HIS RANGE OF ESTIMATES.

A. While Mr. King agrees with my testimony that U S WEST's stock performance was distorted by market activity surrounding the pending merger with Qwest, he includes a DCF estimate for U S WEST (based upon limited data) in his range of estimates. By including this distorted estimate for U S WEST and excluding his estimates for Verizon and SBC, Mr. King subjectively defines a required equity return range for Qwest Corporation to be 10.22% to 12.73%. I believe Mr. King's range is downwardly biased by this quite selective inclusion and exclusion of data.

Using Mr. King's data (corrected for the Verizon dividend) along with his characterization of the Regional Bell Companies as most comparable to Qwest's telephone operations, a more realistic range would be that defined by the three largest telephone companies. Because pre-merger U S WEST was trading as a derivative of Qwest and significantly influenced by arbitrage trading relative to pricing of the merger and speculation about further business combinations affecting both U S WEST and Qwest, it is not reasonable to include pre-merger U S WEST in the required return analysis. Further complicating any DCF analysis was the announcement that U S WEST would pay dividends at the annual rate of $2.14 prior to the merger and that Qwest intended to pay an annual dividend of $0.05 subsequent to merger consummation.

The range of DCF estimates (using Mr. King's data) for the three largest telephone companies is 12.73% to 15.18% and the average is 14.12%.

Q. DO YOU AGREE WITH MR. KING'S STATEMENT THAT "THE HISTORICAL RISK PREMIUM MODEL IS BOTH CONCEPTUALLY AND STATISTICALLY SO FLAWED AS TO BE WITHOUT VALUE?"

A. No. Finance theorists and finance practitioners have consistently advocated the use of historical data to estimate the expected market risk premium over the risk free rate obtained from investment in government securities. For example:

> R_m is the expected return on an average risk asset. Analysts have used two ways to determine the average expected return. One is a risk premium approach: the long term historical return on the risk-free asset is subtracted from the historical return on a proxy for all assets. ... Analysts also use an estimate of the expected market premium. This estimate may come from information derived from security analysts working in money management companies whose job it is to make forecasts for individual stocks. Putting all the forecasts together produces a consensus estimate of the expected U.S. stock market return.
>
> (Diana R. Harrington, Corporate Financial Analysis, 4th Ed., Homewood, IL: Richard D. Irwin, 1993, p. 208.)

In its Financial Executives' Guide to the Cost of Capital, Salomon Brothers advised its clients that, "the most common approach to estimating the risk

premium is to calculate historical risk premiums observed over a large number of years and average them."

In a survey of corporations, financial advisors and textbook authors to identify "best practices" in cost of capital estimation, the authors said,

> Finance theory says the equity risk premium should equal the excess return expected by investors on the market portfolio relative to riskless assets. How one measures expected future returns on the market portfolio and on riskless assets are problems left to practitioners. Because the expected future returns are unobservable, all survey respondents extrapolated historical returns into the future on the presumption that past experience heavily conditions future expectations.
>
> (Robert F. Bruner, Kenneth M Eades, Robert S. Harris, and Robert C. Higgins, "Best Practices in Estimating the Cost of Capital: Survey and Synthesis", Financial Practice and Education, Spring/Summer 1998 page 20.)

Q. WHAT IS MR. KING'S OPINION OF YOUR EX ANTE ESTIMATE OF THE MARKET RISK PREMIUM?

A. Mr. King considers the forward looking ex ante estimate to be more reasonable than the ex post estimate which is based upon historical data. However, Mr. King questions my methodology for developing the ex ante estimate, claiming that the simple average of the growth and yield expectations for the S&P 500 companies is not a valid measure of the total market's earnings requirements.

1

2 **Q. IS YOUR EX ANTE ESTIMATE OF THE MARKET RISK PREMIUM BASED**
3 **UPON A SIMPLE AVERAGE OF GROWTH AND YIELD EXPECTATIONS**
4 **FOR THE S&P 500 COMPANIES?**

5 A. No. Mr. King's criticism is misplaced (or perhaps his reading of my testimony
6 was incomplete). The ex ante estimate of 15.8% for the market required
7 return from my Exhibit PCC-07 is market weighted by the market value of the
8 companies. The market weighting is clearly noted in the exhibit.

9

10 **Q. MR. KING SAYS THAT THE RATE OF RETURN ADJUSTMENT**
11 **PROPOSED IN YOUR TESTIMONY WOULD "GENERATE FAR MORE**
12 **REVENUE THAN ACTUAL FLOTATION COSTS THE COMPANY HAS**
13 **INCURRED." IS THIS CORRECT?**

14 A. No. The analysis on page 36 of Mr. King's testimony is very misleading due
15 to selective interpretation of the data and a faulty calculation.

16

17 **Q. PLEASE EXPLAIN.**

18 A. Mr. King counts $55 million of stock issuance expenses from 1984 to 1994
19 from Exhibit PCC-10 of my direct testimony. Exhibit PCC-10 shows total
20 stock issuance expenses of $166.7 million, and page 57 of my direct

testimony shows $92.1 million of stock issuance expenses applicable to U S WEST Communications.

Stock issuance costs are only applicable to equity financing and for this proceeding only applicable to U S WEST Communications, now Qwest Corporation, the telephone company. Mr. King's calculation takes 0.10% times the Total Liabilities and Equity from the 1999 balance sheet of U S WEST, Inc. , the parent company.

For Arizona, the equity capitalization is slightly over $1 billion ($1,015,260,000) as shown on my supplemental direct Exhibit PCC-02. The dollar difference between the market required return of 13.8% and the equity cost of 14.0% on this equity capital base is slightly over $2 million ($2,030,520).

Q. COULD STOCK ISSUANCE EXPENSES BE AMORTIZED OVER TIME AS SUGGESTED BY MR. KING?

A. Certainly. There are basically two ways for corporations to deal with stock issuance expenses – they can be expensed immediately or amortized over a short period as part of costs assigned to a specific project or use of the equity financing, or they can be recovered as an adjustment to the market required

return on equity capital. Since equity capital is continuously reinvested in telephone plant and equipment over a very long period of time, in my opinion, recovering stock issuance costs through an adjustment to the market required return is the appropriate way for Qwest and the Arizona Commission to deal with stock issuance expenses. This method also eliminates a potential problem of including stock issuance costs in some customers' rates for a relatively short period of time while future customers do not pay these equity financing costs. This would be analogous to amortizing the issuance costs for 30 year bond financing only over the first five or ten years, thus raising financing costs for current customers and lowering them for future customers. I believe that recovering stock issuance expenses through an adjustment to the market required return on equity is appropriate and proper.

Q. IS THE CAPITAL ASSET PRICING MODEL, AS MR. KING SUGGESTS, OF VALUE ONLY IN ASSESSING THE RELATIVE RISK OF DIFFERENT COMPANIES?

A. The Capital Asset Pricing Model (CAPM) is an accepted model that is widely used by investors and finance professionals for equity cost estimation, as noted in my direct testimony. The CAPM is also valuable, as Mr. King suggests, in assessing the relative risk of different companies, and particularly different industry groups. Consistent with my direct testimony at

pages 26-28 noting the dangers of reliance upon data for a single company or use of a single model, I believe the relative risk distinctions based on Beta have more validity for industry groups than for individual companies within industry groups.

Q. DO YOU HAVE DATA SHOWING THE RELATIVE RISK OF INDUSTRY GROUPS?

A. Yes. Exhibit PCC-01 shows betas for industry groups. There is a clear distinction in risk between Mr. King's electric utility group and the telephone industry group. The electric utility industry group has an average beta of .49 and the telco group has an average beta of .84.

Q. WHAT IS YOUR CONCLUSION BASED ON THIS DATA?

A. I conclude that the group of electric utilities presented in Mr. King's testimony is not comparable in risk to Qwest Corporation.

Q. WHAT ARE YOUR CONCLUSIONS RELATIVE TO MR. KING'S TESTIMONY?

A. Mr. King has underestimated the required return on equity investment for Qwest Corporation for three reasons – an error in DCF model estimates for the risk comparable telephone group, reliance upon the DCF estimate for pre-

merger U S WEST, Inc., and reliance upon an electric utility company group that is not risk comparable to Qwest..

When corrected for the Verizon dividend error, Mr. King's DCF analysis of the three largest telephone companies provides a reasonable estimate of the required equity return for Qwest – the range of 12.73% to 15.18% with a midpoint of 14.12%.

COMMENT ON THE TESTIMONY OF STEPHEN G. HILL

Q. WHAT IS MR. HILL'S ESTIMATE OF THE COST OF EQUITY CAPITAL FOR QWEST CORPORATION?

A. Mr. Hill estimates the cost of equity capital for Qwest at 11.75%. In his words, "An equity cost range of 11% to 12.50% (midpoint = 11.75%) encompasses the equity capital cost estimates of both the gas distribution sample and the telcos in that it includes the top of the range of the gas distributors (11%) and the bottom of the range of equity costs for the telcos and property/casualty insurance firms (12.50%)" (Hill Direct, page 45)

Q. IS 11.0% TO 12.5% A REASONABLE ESTIMATE RANGE?

A. No. I believe Mr. Hill has underestimated Qwest's cost of equity capital, principally by his assumption that Qwest's cost of equity range is bounded by the cost of equity for gas distribution companies at the lower end and by its peer group of large telcos at the upper end. I also believe that Mr. Hill's financial modeling techniques and inputs produce downward biased results.

Q. WHAT'S WRONG WITH ESTIMATING THE LOWER END OF QWEST'S COST OF EQUITY RANGE BY MODELING EQUITY COSTS FOR GAS DISTRIBUTION COMPANIES?

A. Qwest Corporation and other large local exchange carrier telcos are in a riskier environment than gas distribution companies. It's true that gas distribution companies have lower risk than the telcos – that fact is illustrated in my Exhibit PCC-01. Mr. Hill's gas distribution companies have an average beta of .55 and the average beta for telcos is .84.

What's wrong with Mr. Hill's assumption that the bottom of the equity cost range for Qwest equals the top of the range for the gas distributor group is that the gas distributors are not risk comparable to Qwest. Mr. Hill's assumption gives a downward bias to his cost of equity range for Qwest.

1 **Q. SIMILARLY, IS IT REASONABLE TO CONCLUDE THAT THE TOP OF THE**
2 **RANGE OF EQUITY COST FOR QWEST IS THE BOTTOM OF THE**
3 **RANGE OF EQUITY COSTS FOR THE TELCOS?**
4 A. No. Qwest Corporation is a telephone company and in the business of
5 providing local, toll, and access services in competition with other providers in
6 an industry that is experiencing consolidation and convergence of technology.
7 In order to accept Mr. Hill's recommendation, one would have to believe that
8 Qwest corporation, and specifically Qwest's operations in Arizona are
9 significantly less risky than SBC, BellSouth, Verizon, and other telcos. And,
10 one would have to accept this recommendation without the support of
11 objective data, because Mr. Hill has presented no evidence or data to support
12 his assumption that the risk, and thus the equity capital cost, for Qwest is
13 lower than the other telephone companies.
14
15 **Q. WHAT ABOUT MR. HILL'S ARGUMENT THAT THE RHCS AND GTE ARE**
16 **MORE RISKY THAN QWEST BECAUSE OF THEIR "SIGNIFICANT**
17 **DIVERSIFICATION INTO UNREGULATED, COMPETITIVE**
18 **OPERATIONS?"**
19 A. Mr. Hill's argument appears to be a gross exaggeration. Examination of
20 revenue and operating income data for the RHCs and GTE reveals that the
21 operations of these companies are very much concentrated in the provision

of local exchange telephone services and only minimally diversified into unregulated operations. The investment bank, Paine Webber, in its Incumbent Local Exchange Carrier First Quarter Review, published June 8th, 2000 shows the following sources of consolidated revenue and operating income for first quarter 2000 for the five large ILECS – Bell Atlantic, BellSouth, GTE, SBC, and U S WEST:

	Revenue	Operating Income
Domestic Wireline	75%	78%
Domestic Wireless	12%	10%
Directory	7%	12%
Other	6%	--

The Value Line Investment Survey (which Mr. Hill relies upon extensively for his testimony) categorizes 1999 revenue for these companies as follows (data from July 7, 2000 edition):

Bell Atlantic	'99 telco rev: local service 55%; access charges, 30%; toll 7%, other, 8%.
BellSouth	'99 revenues: local service, 43%; network access, 19%; wireless 22%, directory, 8%; toll, 2%; other 6%.
GTE Corp	no revenue categorization
SBC	'99 sales mix: landline local service, 39%; network access, 21%; long

	distance, 7%; wireless, 11%; directory advertising, 9%; other 13%
U S WEST	'99 revenue breakdown: local service, 59%; network access, 21%; directory services, 11%; long distance, 4%; other, 5%.

The data shows that the large ILEC telcos are very concentrated in the provision of local exchange and directory services and that their principal diversification effort is provision of domestic wireless services which are a close substitute for wireline local and toll services.

Q. IS QWEST'S COST OF EQUITY CAPITAL FOR PROVISION OF LOCAL EXCHANGE SERVICES IN ARIZONA LESS THAN THE COST OF EQUITY CAPITAL FOR OTHER LARGE TELCOS TO PROVIDE SERVICES IN THE STATES THEY SERVE?

A. No. Qwest is providing the same types of services and faces the same competitive forces as the other telcos in the other states. Regulation provides no lessened risk for Qwest nor does it provide any more favorable access to capital investment. Qwest must compete with other companies, principally other telcos, interexchange carriers, wireless providers, and CLECs for equity investment funding.

Q. WHAT IS MR. HILL'S RATIONALE FOR INCLUDING A GROUP OF INSURANCE COMPANIES IN HIS COST OF EQUITY ESTIMATE FOR QWEST?

A. Mr. Hill says that,

> My inclusion of property/casualty insurance companies in my analysis in this proceeding is designed to provide a more reliable upper bound to the cost of equity range for a local exchange telephone operation. The insurance industry is highly competitive. It is a relatively simple process to change one's insurance provider, and no one firm has a franchise operation in any locale or is a provider through which other insurance must be accessed (like local exchange service). Hill Direct, p. 18.

Q. DOES THIS RATIONALE MAKE ANY SENSE TO YOU?

A. No. It makes no sense to me. I don't see anything about the property/casualty insurance industry that makes it a "more reliable upper bound to the cost of equity range appropriate for a local exchange telephone operation." Nor have I ever seen an equity analyst or bond rating agency link telco capital costs to the insurance industry.

As for industries that are "highly competitive, relatively simple to change providers, and no one firm has a franchise operation in any locale", I could also substitute banks, grocery stores, automobile manufacturers, or credit

card providers. Mr. Hill's selection of property/casualty insurance firms appears to be completely ad hoc.

Q. HOW DOES MR. HILL ACTUALLY DERIVE HIS 11.00% TO 12.50% RANGE OF COST OF EQUITY ESTIMATES FOR QWEST?

A. It's a complicated process of picking and choosing and adjusting the summary data shown on page 44 of his testimony. He places primary reliance upon DCF estimates which average 12.71% for telcos, 12.48% for insurance companies, and 10.86% for gas distributors. After adjustments, Mr. Hill estimates a range for telcos and insurance companies of 12.5% to 13.0% and for gas distributors of 10.5% to 11.0%. His estimated range for Qwest's cost of equity is 11.0% to 12.5% with a midpoint estimate of 11.75%. As indicated above, I believe Mr. Hill's selection of gas distribution companies as the lower bound and telcos as the upper bound significantly understates Qwest's cost of equity capital. There are also methodological issues which, in my opinion, cause Mr. Hill's equity cost estimates to be unreasonably low.

Q. WHAT ARE THE METHODOLOGICAL ISSUES?

A. There are a number of ways in which Mr. Hill and I differ in our approach to estimating the cost of equity capital – it is expected that experts will differ in their use of data and models. However, there are three areas where I believe

Mr. Hill's methodology significantly departs from accepted financial theory and practice and significantly affects the cost of equity estimate. First, Mr. Hill includes the pre-merger data for U S WEST in his analysis. The vertical nature of this merger, the stock price volatility, and the announced change in dividend policy should cause the analyst to set this data aside and look to the rest of the industry to estimate capital costs. I would contrast this situation with Bell Atlantic and GTE which was a horizontal merger between two large ILECs, with the announcement of a stable dividend policy and without the drama of a foreign buyer entering the fray.

Second, Mr. Hill makes significant judgments and adjustments to the expected growth rate inputs to his DCF models, which have significant impacts on the outputs or results of those models. I address this issue in more detail later in this testimony.

Third, in his implementation of the Capital Asset Pricing Model, Mr. Hill develops a range based on a market risk premium derived from the arithmetic average of historical data and the geometric average of historical data. This is not an unequivocal issue but thorough study of the literature and surveys of practice indicate that the arithmetic average is required in cost of equity estimation.

Q. HOW WOULD MR. HILL'S RESULTS BE DIFFERENT IF PRE-MERGER U S WEST WAS EXCLUDED FROM THE ANALYSIS?

A. For the DCF analysis on Mr. Hill's Schedule 7, page 1 of 3, the average for the telcos would be 13.1% and, the standard deviation goes down to 1.07%. I was not able to exclude U S WEST from Mr. Hill's CAPM analysis because he does not provide individual company betas – only the industry beta of .81 is shown in his testimony. Using Mr. Hill's method of rounding the DCF result to the nearest ¼ percentage point, 13.0% and establishing a 50 basis point range around that equity cost estimate produces a range of equity cost estimates for the telcos of 12.75% to 13.25%.

Q. HOW DOES MR. HILL'S SELECTION OF GROWTH RATE INPUTS TO HIS DCF MODELS AFFECT THE OUTPUTS?

A. Mr. Hill's selection of growth rate inputs to his DCF models produces a significantly lower cost of equity estimate output than would be obtained by using the analysts' consensus growth rate as the input. While Mr. Hill discusses his rationale for growth rate selection at length in his testimony, the reality is that he has substituted his single personal view of expected growth for the collected growth rate analysis from a number of professional analysts.

In an article titled, "How Trustworthy is Your Valuation Model?", Daniel Rie discusses the issue of single analysts making adjustments to model inputs based upon ad hoc judgments. This article was required reading in my Chartered Financial Analyst curriculum and presented a number of significant conclusions:

> In order to adjust for model weaknesses, many analysts try to "second guess" the model by providing input estimates that lead to the desired results.
>
> Because individual judgments are subject to exactly the same kind of error biases as model predictions, overriding model predictions with *ad hoc* judgments will tend to reduce, rather than enhance, performance.
>
> Individual analysts' estimates have larger error variances than the consensus mean, even when the analyst has superior skill.
>
> There are virtually no realistic circumstances under which it would be appropriate for an organization to ignore consensus information and base valuations solely on their own analysts' expectations.
>
> (Daniel Rie, "How Trustworthy is Your Valuation Model?", Financial Analysts Journal, November/December 1985, pp. 195-201)

If Mr. Hill had used the consensus mean of analysts growth forecasts in his DCF models, his results would have shown a slightly higher cost of equity for the gas distribution companies, and a significantly higher cost of equity for the telecommunications companies and insurance companies.

Q. WHAT ARE THE DCF MODEL RESULTS USING THE CONSENSUS MEAN OF ANALYSTS' GROWTH FORECASTS?

A. I have prepared Exhibit PCC-02 which replicates Mr. Hill's Schedule 7 with his dividend yields from Schedule 6 and his analysts growth rates from Schedule 5. The results are as follows:

Company Group	DCF Cost of Equity Capital
Telecommunications	14.43%
Insurance Companies	13.82%
Gas Distribution Cos	11.24%

Q. WHAT IS THE CAPM ISSUE AROUND USE OF ARITHMETIC AND GEOMETRIC AVERAGES OF HISTORICAL RETURNS USED TO ESTIMATE THE MARKET RISK PREMIUM?

A. The issue is whether the arithmetic mean or average of past investment returns or the geometric mean or compound rate of return of past investment returns should be used going forward in estimating expected returns. The issue is technical and there is not universal agreement among finance academics and practitioners, but a thorough review of literature and financial practice indicate that the arithmetic mean of historical returns should be used

in cost of capital estimation. Mr. Hill's use of the geometric mean of historical returns in his CAPM analysis gives a downward bias to the resulting cost of equity estimate. In defense of his use of the geometric mean, Mr. Hill cites Copeland, Currin and Koller who say that, "We believe that the geometric average represents a better estimate of investors expected returns over long periods of time." In a 1998 survey of corporations, leading financial advisors, and financial texts, "Best Practices in Estimating the Cost of Capital: Survey and Synthesis", published in Financial Practice and Education, Spring/Summer 1998, Professors Bruner, Eades, Harris, and Higgins characterize the work cited by Mr. Hill as a "minority view".

Professors Brealy and Myers in the 5th edition of their Principles of Corporate Finance text provide an example to clarify the issue and demonstrate why the arithmetic average must be used in cost of capital estimation:

> The proper uses of arithmetic and compound rates of return from past investments are often misunderstood. Therefore we call a brief time-out for a clarifying example.
>
> **Example:** Suppose that the price of Big Oil's common stock is $100. There is an equal chance that at the end of the year the stock will be worth $90, $110, or $130. Therefore, the return could be -10 percent, +10 percent, or +30 percent (we assume that Big Oil does not pay a dividend). The *expected* return is 1/3 (-10 +10 +30) = +10 percent.

If we run the process in reverse and discount the expected cash flow by the expected rate of return, we obtain the value of Big Oil's stock:

$$PV = \frac{110}{1.10} = \$100$$

The expected return of 10 percent is therefore the correct rate at which to discount the expected cash flow from Big Oil's stock. It is also the opportunity cost of capital for investments which have the same degree of risk as Big Oil.

Now suppose that we observe the returns on Big Oil stock over a large number of years. If the odds are unchanged, the return will be -10 percent in a third of the years, +10 percent in a further third, and +30 percent in the remaining years. The arithmetic average of these yearly returns is:

$$\frac{-10 + 10 + 30}{3} = +10\%$$

Thus, the arithmetic average of the returns correctly measures the opportunity cost of capital for investments of similar risk to Big Oil stock.

The compound annual return on Big Oil stock is:

$$(.9 \times 1.1 \times 1.3)^{1/3} - 1 = .088, \text{ or } 8.8\%$$

less than the opportunity cost of capital. Investors would not be willing to invest in a project that offered an 8.8 percent expected return if they could get an expected return of 10 percent in the capital markets. The net present value of such a project would be:

$$NPV = 100 + \frac{108.8}{1.1} = -1.1$$

Moral: If the cost of capital is estimated from historical returns or risk premiums, use arithmetic averages, not compound annual rates of return.

(Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance, (5th Ed; New York: McGraw-Hill, Inc.; 1996, pp. 146-147.)

I have prepared Appendix I, which provides a review of the literature on this issue and a more technical explanation of the circumstances under which the arithmetic and geometric mean returns are appropriate surrogates for expected returns. The geometric mean return will always produce a biased estimate of the expected holding period return except in the unlikely circumstance in which the length of the expected holding period is equal to the length of time spanned by the historical observations, which in the data presented by Mr. Hill is 73 years (1926-1998). For expected holding periods of 5 years or less (which is indicated by stock market activity) we can confidently employ the arithmetic mean of historical risk premiums to estimate the expected equity risk premium.

Q. HOW WOULD MR. HILL'S CAPM ANALYSES BE DIFFERENT IF THE GEOMETRIC MEAN OF PAST OBSERVATIONS WAS NOT USED TO CALCULATE THE MARKET RISK PREMIUM?

A. Using the data from Mr. Hill's Schedule 8 to perform the CAPM analysis using the arithmetic mean risk premium produces the following cost of capital estimates:

Company Group	CAPM Cost of Equity Capital

Telecommunications	13.66%
Insurance Companies	14.51%
Gas Distribution Cos	11.42%

Q. HOW WOULD YOU SUMMARIZE MR. HILL'S DATA AFTER CORRECTION FOR THE THREE SIGNIFICANT METHODOLOGICAL ISSUES?

A. I would summarize the corrected model results in a table similar to that found on page 44 of Mr. Hill's testimony:

METHOD	TELCOS	INSURANCE	GAS DISTRIB.
DCF	14.43%	13.82%	11.24%
CAPM	13.66%	14.51%	11.42%

Q. HOW WOULD YOU INTERPRET THIS SUMMARY OF DATA?

A. Recognizing that this is Mr. Hill's data corrected for methodological deficiencies and not my own data and analysis, I would interpret this data as follows. The gas distribution companies are certainly of lower risk than Qwest and in a regulated, but very different industry than Qwest, and the 11% plus cost of equity estimates reflect those differences. The insurance companies are a different industry altogether and I can discern no logical relationship in their selection to either Qwest or the telecommunications industry. Therefore, I would disregard the insurance company estimates. The telcos are the most

comparable companies to Qwest and its operations in Arizona. I would use the range of DCF (14.43%) and CAPM (13.66%) estimates for the telcos as the reasonable range for the cost of equity for Qwest.

COMMENT ON THE TESTIMONY OF DR. JOHN. B. LEGLER

Q. WHAT IS DR. LEGLER'S RECOMMENDATION IN THIS PROCEEDING?

A. Dr. Legler recommends that a cost of common equity of 11.50% be adopted based on the company's proposed capital structure and embedded cost rates for debt.

Q. HOW DOES DR. LEGLER ESTIMATE THE COST OF EQUITY CAPITAL FOR QWEST TO BE 11.5%?

A. Before the data is examined, the answer to this question has to begin with Dr. Legler's statement early in his testimony that, "It is my opinion the application of finance theory can provide help and guidance in the decision process, but that the issue of a fair return is still largely judgmental." (Legler Direct, p. 3). Dr. Legler's emphasis on his exercise of judgment provides the critical linkage between the summary of financial model results shown on page 49 of his testimony and his 11.50% recommendation. In other words, without the factor of Dr. Legler's judgment, "you can't get there from here."

Dr. Legler's summary of financial model results on page 49 has cost of equity estimates that range from less than 7% to nearly 20%.

Q. DOES DR. LEGLER'S TESTIMONY INDICATE WHICH MODEL OR MODELS HE RELIED UPON MOST IN DEVELOPING HIS RECOMMENDED RANGE OF 11.0% TO 12.0%?

A. Dr. Legler states on page 50 that, "The bottom end of my recommended range is slightly above the midpoint of my CAPM results. The upper end of my recommended range is the upper end of my risk premium analysis for U S WEST." Thus it appears that Dr. Legler's recommendation relies upon his CAPM model results for U S WEST, Independent Telephones, and Bell Regional Holding Companies and his "bond yield plus risk premium method" for U S WEST.

Q. IS DR. LEGLER'S RELIANCE UPON THE CAPM AND RISK PREMIUM METHODS CONSISTENT WITH HIS TESTIMONY ON THE APPLICATION OF THESE METHODS?

A. No, it is not at all consistent. Reading through Dr. Legler's testimony and following the logic of his arguments relative to the different financial models, it

was a surprise to get to the end and find that his recommendation relies upon the very models he denigrated earlier.

Of the risk premium method, Dr. Legler says:

> At the present time, I do not believe exclusive reliance should be placed upon it for estimating the cost of equity. (Legler Direct, page 27)
>
> I believe it should be used with care and be reflective of current conditions. Therefore, it should not stand on its own but be used in conjunction with other estimating techniques. (Legler Direct, page 27)
>
> For the reasons cited earlier in my testimony, I believe that these [risk premium] calculations should be supported by other estimating techniques to be meaningful. (Legler Direct, page 34)

In contrast to his statement on page 27 that the risk premium "should be reflective of current conditions", on page 34, Dr. Legler says that "there is little support for the short-term risk premium analysis." The short-term is not reflective of current conditions?

Of the CAPM, Dr. Legler says:

> I believe that there are fairly severe problems with the required data inputs usually employed by analysts using this method which result in internal inconsistencies. For this reason for many years, I did not use this method in my testimony. Since the method is enjoying increased popularity among cost of capital witnesses, I feel compelled to comment on the use of this model and offer an estimate using the CAPM. (Legler Direct, page 35)

I find it odd that a witness with Dr. Legler's educational and professional background and experience would "feel compelled" to offer an estimate using the CAPM and then, in spite of his beliefs about "fairly severe problems with the required data inputs" would rely upon this model in his recommendation.

Q. DOES DR. LEGLER PLACE ANY RELIANCE UPON HIS DCF METHOD ESTIMATES?

A. Apparently not. On page 49 of his testimony, Dr. Legler presents DCF method cost of equity estimates which range 13.05% to 19.83% with averages ranging from 16.41% to 16.82%. His discussion of model results is silent with regard to the DCF estimates.

Q. WHAT ARE YOUR COMMENTS ON DR. LEGLER'S RISK PREMIUM STUDIES?

A. I believe Dr. Legler's risk premium studies are deeply flawed. I would not place any reliance upon those studies for cost of equity estimation for the following reasons. All of the studies relate observed bond yields to Dr. Legler's DCF generated cost of equity estimates which are based on data provided by a single source – The Value Line Investment Survey. In contrast, the more widely used source of data for estimating risk premiums, the capital

market data provided by Ibbotson Associates, uses observed bond yields and observed equity returns. For U S WEST, Dr. Legler's risk premium study begins in the third quarter of 1984 and ends in the first quarter of 1999. This is a short period of time upon which to base a risk premium. Granted, U S WEST (now Qwest) has only been a corporation since 1984, but the equity risk premium is not unique to U S WEST or any other company. Most financial analysts use the full 74 years (1926-1999) of available stock and bond return data in estimating future risk premia.

In Dr. Legler's U S WEST risk premium study, there is substantial variation in the DCF cost of equity estimates produced by his two variants of Value Line data. One method produces single digit equity cost estimates since the second quarter of 1993 and the other method shows quarter to quarter swings in cost of equity estimates from 9% to 15%. Dr. Legler did remove the negative (or near zero) risk premiums from 1994 on in this study, but the paucity of remaining data and the questionable nature of the DCF estimates would lead me to place no reliance upon the resulting risk premium estimates.

Dr. Legler's Independent company risk premium analysis has the characteristics of a "black box" model, where only the outputs, not the inputs

are visible. The data purportedly is for more than one company, but the companies are not identified, nor is there any indication in Dr. Legler's testimony on how these companies' earnings, dividends, prices, dividend yields, and growth rates are calculated or weighted. The data spans 22 years from 1978 to 1999. This is longer than his U S WEST study, but still short by historical standards. As is the case with the data for U S WEST, there is substantial variation in Dr. Legler's calculated risk premia in the recent past. For the independents, for the period 1995-1999, Dr. Legler's calculated risk premium based on retention growth is 9.93% and his calculated risk premium based on Value Line Growth is 1.07%.

Q. WHAT IS YOUR CONCLUSION ABOUT DR. LEGLER'S RISK PREMIUM MODELS?

A. I would not use the results of Dr. Legler's risk premium models to estimate the cost of equity capital for Qwest. There are too many problems with the data and the time period spanned by the models is too short.

Q. IS THERE ALTERNATIVE RISK PREMIUM DATA AVAILABLE?

A. Yes. The Ibbotson Associates publication, Stocks, Bonds, Bills & Inflation 2000 Yearbook provides market results for stock and bond returns from 1926 to 1999. This data is commonly used by analysts in risk premium models.

Exhibit PCC-09 to my supplemental direct testimony develops such a risk premium model which is used as a reasonableness check for cost of equity estimates.

This exhibit shows the difference between returns from corporate bonds and common stocks over the 74 year period from 1926 to 1999. The 7.4% difference between common stock returns and corporate bond returns is the historical equity risk premium that is commonly used to estimate the expected equity risk premium. Over a long period of time, common stock investors have realized a 7.4% greater return than corporate bond investors. This equity risk premium is substantially higher than Dr. Legler's estimates.

Simply adding the 7.4% equity risk premium to the latest Moody's bond yields (May 2000) shown in Dr. Legler's Schedule 14 would produce cost of equity estimates ranging from 15.62% to 16.26%. A more comprehensive analysis which also incorporates a forward looking, ex ante, risk premium and adjusts for the lower than market average risk for Qwest is shown in my supplemental direct testimony Exhibit PCC-09. The result of this analysis is a cost of equity range of 14.1% to 14.3%.

Q. WHAT ARE YOUR COMMENTS ON DR. LEGLER'S CAPM MODELS?

A. I find it interesting that Dr Legler advocates averaging three months of stock prices for implementation of his DCF models, but selects a current treasury bond yield to implement his CAPM model. While it does create a timing difference between his model results, I don't believe this is a serious problem. More problematic is Dr. Legler's mix of adjusted and unadjusted betas in his CAPM model. The use of different beta construction creates a wider range of results than I would expect from the CAPM. Consistent with my comments earlier about distorted market data for pre-merger U S WEST, I would not rely upon the stand alone CAPM model results for U S WEST.

Q. WHAT ARE YOUR CONCLUSIONS ABOUT DR. LEGLER'S TESTIMONY?

A. Dr. Legler presents financial model results with cost of equity estimates ranging from less than 7% to nearly 20%. From this data, Dr. Legler concludes that the cost of equity capital for Qwest is in the range of 11.0% to 12.0% and indicates that this range is close to, but not necessarily derived from the CAPM results and the risk premium analysis for U S WEST. I have pointed out deficiencies in Dr. Legler's models and noted that his extensive DCF model analysis was ignored in the final recommendation. My overall conclusion is that Dr. Legler's recommendation on the cost of equity capital for Qwest is primarily based upon his own opinion and not upon capital market data and financial models. To accept Dr. Legler's recommendation,

one would have to have more confidence in Dr. Legler's opinion than in financial models and capital market data.

CONCLUSION AND RECOMMENDATION

Q. WHAT IS YOUR RECOMMENDATION FOR A FAIR RETURN ON EQUITY FOR QWEST.

A. I believe the testimony presented by Mr. King, Dr. Legler, and Mr. Hill underestimates the cost of equity capital for Qwest Corporation. My recommended range for a fair return on equity is the range of cost of equity estimates of 13.5% to 14.5% and my specific recommendation for the Commission allowed return on equity is the midpoint of the range, 14.0%

Q. WHAT IS YOUR RECOMMENDATION FOR A FAIR OVERALL RETURN ON RATE BASE FOR QWEST?

A. Combining the fair return on book equity range and Qwest's capital structure and embedded debt cost, my recommendation for a fair overall return on rate base is the range of 10.59% to 11.12% with a midpoint recommendation of 10.86% which is calculated as follows:

	Percent	Cost	Weighted Cost
Debt	47.6%	7.39%	3.52%
Equity	52.4%	14.0%	7.34%
Overall Return			10.86%

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

APPENDIX I

ARITHMETIC AND GEOMETRIC MEANS

When using historical risk premiums as a surrogate for the expected market risk premium, the relevant measure of the historical risk premium is the arithmetic average of annual risk premiums over a long period of time. In a sense, this is counter-intuitive because we commonly use the geometric mean of returns to measure the average annual achieved return over some period of time.

In cost of capital estimation, what we are looking for is the rate of return that investors expect -- a "target" rate of return. The actual rate of return will vary around this target rate of return. Investors are savvy enough to realize that the exact target rate of return won't be achieved in each and every year. Some years returns will exceed the target and some will fall short, but, on average, investors expect to achieve their target return.

A Non-technical Explanation

Ibbotson Associates[1] provides a good, non-technical explanation of why the arithmetic mean of historical risk premiums should be used in calculating the expected equity risk premium:

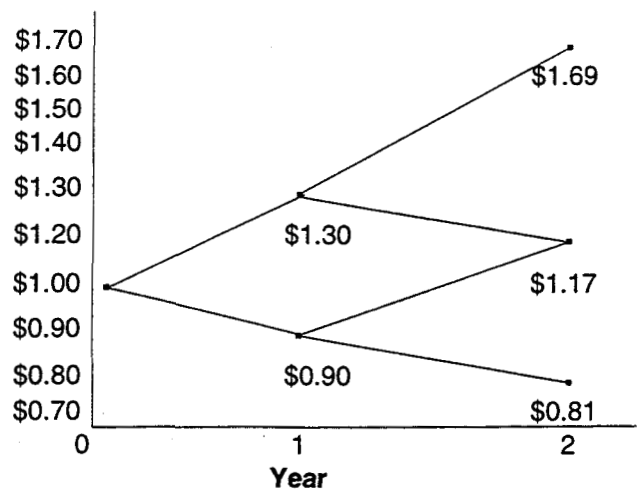
> **Arithmetic Versus Geometric Means**
> The expected equity risk premium should always be calculated using the arithmetic mean. The arithmetic mean is the rate of return which,

[1] Ibbotson Associates, Stocks, Bonds, Bills and Inflation 1995 Yearbook, Chicago, IL, 1995. pp. 150-151.

when compounded over multiple periods, gives the mean of the probability distribution of ending wealth values. (A simple example given below shows this is true.) This makes the arithmetic mean return appropriate for computing the cost of capital. The discount rate that equates expected (mean) future values with the present value of an investment is that investment's cost of capital. The logic of using the discount rate as the cost of capital is reinforced by noting that investors will discount their expected (mean) ending wealth values from an investment back to the present using the arithmetic mean, for the reason given above. They will therefore require such an expected (mean) return prospectively (that is, in the present looking toward the future) in order to commit their capital to the investment.

For example, assume a stock has an expected return of +10 percent in each year and a standard deviation of 20 percent. Assume further that only two outcomes are possible each year -- +30 percent and -10 percent (that is, the mean plus or minus one standard deviation) and that these outcomes are equally likely. (The arithmetic mean of these returns is 10 percent, and the geometric mean is 8.2 percent.) Then the growth of wealth over a two-year period occurs as shown below:

Growth of $1.00



Note that the median (middle outcome) and mode (most common outcome) are given by the geometric mean, 8.2 percent, which compounds up to 17 percent over a 2 year period (hence a terminal wealth of $1.17.) However, the expected value, or probability weighted average of all possible outcomes is equal to:

$$(.25 \quad x \quad 1.69) = 0.4225$$

+	(.50	x	1.17)	=	0.5850
+	(.25	x	0.81)	=	0.2025
TOTAL					1.2100

Now, the rate that must be compounded up to achieve a terminal wealth of $1.21 after 2 years is 10 percent; that is, the expected value of the terminal wealth is given by compounding up the arithmetic mean, not the geometric. Since the arithmetic mean equates the expected future value with the present value, it is the discount rate.

Stated another way, the arithmetic mean is correct because an investment with uncertain returns will have a higher expected ending wealth value than an investment which earns, with certainty, its compound or geometric rate of return every year. In the above example, compounding at the rate of 8.2 percent for two years yields a terminal wealth of $1.17, based on a dollar invested. But holding the uncertain investment, with a possibility of high returns (two +30 percent years in a row) as well as low returns (two -10 percent years in a row), yields a higher expected terminal wealth, $1.21. In other words, more money is gained by higher than expected returns than is lost by lower than expected returns. Therefore, in the investment markets, where returns are described by a probability distribution, the arithmetic mean is the measure that accounts for uncertainty, and is the appropriate one for estimating discount rates and the cost of capital.

A Technical Explanation

A technical explanation of why the expected equity risk premium should be calculated using the arithmetic mean begins with the common and recommended practice to utilize realized holding period returns to estimate expected returns on financial assets.[2] Further, empirical evidence suggests that realized returns on

[2] For example: "... the expected equity risk premium is unobservable in the market and must be estimated, typically by using historical data." Stocks, Bonds, Bills, and Inflation 1995 Yearbook, Ibbotson Associates, Chicago, IL, 1995, p. 147. "There are two

financial assets can be treated as random variables for purposes of estimating their expected values.[3] Consequently, a procedure is required that will produce the expected value of a random variable (the holding period return) conditioned (dependent) upon the past realizations (historic returns) of that variable. Mathematics clearly specifies the procedure which will produce an unbiased estimate of the expected future value of a random variable. The expected future

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commonly used methods for estimating the market premium: (1) the historical average approach, and (2) the growth model approach (footnote omitted). ... The most commonly used approach relies on historical data.", Michael C. Ehrhardt, The Search for Value: Measuring the Company's Cost of Capital, Harvard Business School Press, Boston MA, 1994, p. 61. "To estimate future returns, Mr. Siegel recommends using average historical returns". Lynn Asinof, "Check the Past When Investing for the Future," YOUR MONEY MATTERS: WEEKEND REPORT, The Wall Street Journal, February 11, 1994, p. C1, "Financial economists argue that the historical risk premium is our best predictor of the expected risk premium in the future (footnote omitted).", Stephen A. Ross, Randolph W. Westerfield, Jeffrey F. Jaffe, Corporate Finance, Richard D. Irwin, Inc., Homewood, IL, 1990, p. 244.

[3] A random variable is one that is independent (the value of the variable in any time period is independent of its value in other time periods) and identically distributed (the variable's probability density function is stationary, i.e. the likelihood of obtaining any observed value does not change over time).

Ibbotson Associates finds that "The serial correlation coefficient for the total return on the overall stock market less long-term government bond income returns over the 69-year period 1926 - 1994 is nearly zero, based upon yearly returns. (That is, there is no discernible pattern in the realized risk premium--implying that it is virtually impossible to forecast next year's realized risk premium on the premia in previous years.) This result is powerful evidence in favor of treating the equity risk premium as a random variable." Stocks, Bonds, Bills, and Inflation 1995 Yearbook, p. 148, footnote 16. Ross, Westerfield and Jaffe, pp. 347-348 also present evidence of statistically insignificant serial correlation for nine different stock markets. In contrast Reichenstein and Rich summarize research claiming stock returns may be partially predictable in the long term. William Reichenstein and Steven P. Rich, "Predicting Long-Horizon Stock Returns: Evidence and Implications," Financial Analysts Journal, January-February 1994, pp. 73-76. Reichenstein and Rich's article illustrates the difficulties in rejecting the hypothesis that financial asset returns are a random series. The authors note that the explanatory power of some of the variables is quite small, that the predicted relationships do not hold across all periods and that the findings are not always statistically significant.

value of a random variable is the arithmetic mean of its previously realized values.[4] The prescription to employ the arithmetic mean of past observations is unambiguous. Why then do practitioners sometimes encounter suggestions to employ the geometric mean of the historical return series rather than the arithmetic mean when estimating expected holding period returns?[5] The answer is intuitively reasonable. The arithmetic mean of past observations will only produce an unbiased estimate of future expectations if the past observations are comparable to the future expectation. More specifically, one must understand the interrelationships that exist between: (1) the number of historical returns employed to estimate the expected return, (2) the length of the holding period for which the historical returns were calculated, and (3) the length of the holding period for which the expected return is desired. Symmetry must be maintained between the lengths of historic and expected holding periods to avoid introducing bias into the expected return estimate. Therefore, while the arithmetic mean will always produce an unbiased estimate of

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[4] "The best estimate of the expected value of a variable that has behaved randomly in the past is the average (or arithmetic mean) of its past values.", Stocks, Bonds, Bills, and Inflation 1995 Yearbook, p. 148. "In statistical parlance, the arithmetic average is the unbiased measure of the expected value of repeated observations of a random variable ...", Roger A. Morin, Regulatory Finance: Utilities' Cost of Capital, 2d, Public Utilities Reports, Inc., Arlington VA, 1994, p. 276.

[5] For example: "The best estimate of a future year's return based on a random distribution of the prior years' returns is the arithmetic average. Statistically, it is our best guess for the holding-period return in a given year. If we wish to estimate the ending value of an investment over a multiyear horizon conditioned on past experience, however, we should use the geometric mean." Mark Kritzman, "What Practitioners Need to Know ... ... About Return and Risk," Financial Analysts Journal, May-June 1993 p. 15. "Therefore, if you believe that stockholders in your company engage in a buy-and-hold strategy, you should use a geometric average. If you believe that stockholders rebalance their portfolios monthly, however, you should use an arithmetic average (footnote omitted).", Ehrhardt, p. 62.

expected return, it is the nature of the interrelationships just described that dictate how the historical data must be manipulated before the arithmetic mean is calculated if estimation bias is to be avoided. The remainder of this appendix will explain the sources of bias and provide a generalized procedure for developing an unbiased estimate of the expected holding period return. During the course of the discussion it will also become apparent that in those instances where the geometric mean is the appropriate unbiased estimator of expected return, the geometric mean is effectively the arithmetic mean as well.

Blume's Analysis

Blume[6] conceptually describes and mathematically proves the biases that arise when symmetry is not maintained between the length of the historical holding periods and the length of the expected holding period. Assuming that realized returns are random variables, Blume mathematically proves that, given a finite number of T one-period return relatives[7] and a desired holding period of length N the following conditions exist with respect to developing estimates of expected returns:

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[6] Marshall E. Blume, "Unbiased Estimators of Long-Run Expected Rates of Return," Journal of American Statistical Association, September 1974, pp. 634-638.

[7] A return relative (or wealth relative) is 1 + the holding period return for the period over which the return is calculated.

1. If N = 1 the arithmetic average of the T realized return relatives is an unbiased estimate of expected return.

2. If N > 1 the arithmetic average of the T realized return relatives is an upwardly biased estimate of the expected return.

3. If N < T the geometric average of the T realized return relatives is a downwardly biased estimate of the expected return.

4. If N = T the geometric mean of the T realized return relatives is an unbiased estimate of expected return.

5. If N > T the geometric mean of the T realized return relatives is an upwardly biased estimate of the expected return.

When the length of the historic and expected holding periods are symmetric (Condition 1, N = 1) the arithmetic mean provides an unbiased estimate of the expected return. When the expected holding period is greater than 1, (Condition 2, N > 1), the arithmetic mean of the historic one-period realized returns yields an upwardly biased estimate of the expected holding period return. Conditions 3, 4, and 5 reveal that the geometric mean of the return relatives will <u>always</u> produce a biased estimate of the expected holding period return <u>except</u> in the relatively infrequent circumstance where the length of the holding period for the expected

return is equal to the length of time spanned by the historical observations employed.[8] The Ibbotson data spans 69 years and thus the geometric mean would only yield an unbiased estimate for an expected holding period of 69 years.

Generalized Unbiased Estimator

Given the probability of variation between expected and historic holding periods, it is desirable to identify a generalized unbiased estimator for expected holding period returns. Blume, Hasbrouck[9] and Cheng[10], provide several such generalized

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[8] For example, if 10 historic annual holding period returns are employed to estimate an expected 10-year holding period return, then the geometric mean is an unbiased estimator. Blume, p. 635, explains why the geometric mean is an unbiased estimator of expected return when the length of the expected holding period N is equal to the number of historical observations T, or more precisely when the length of the holding period is equal to the length of time spanned by the total number of historical observations employed.

> "If N = T, the geometric mean raised to the Nth power provides an unbiased estimator, but this is not surprising in that this estimator is merely one drawing from the distribution of N-period relatives. A single drawing from a distribution is of course an unbiased estimator of the mean."

More intuitively perhaps, recall that holding period returns are simply the mathematical result obtained from geometrically linking the single period returns that were realized during the holding period. Hence 10 historical annual returns are required to estimate the expected holding period return for a holding period of 10 years. Thus effectively only one historical observation of one ten-year holding period return is available. Of course the average of a single observation is simply the observation and thus when N=T the geometric mean of the historical observations is the same as the arithmetic mean of all possible historic holding periods.

[9] Joel Hasbrouck, "On Estimates of Long-Run Rates of Return: A Note," Journal of Financial And Quantitative Analysis, December 1983, pp. 455- 461.

[10] Pao L. Cheng, "Unbiased Estimators of Long-Run Expected Returns Revisited," Journal of Financial and Quantitative Analysis, December 1984, pp. 375-393.

unbiased estimators and test their relative efficiencies.[11] All the estimators employ the same basic procedure.[12] The difference between the estimators is the manner in which historic return observations are treated in order to preserve symmetry between historic and expected holding periods.[13] The most efficient unbiased

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[11] If two unbiased estimators are compared, the estimator with the smaller variance is preferred and deemed to be the more efficient estimator.

[12] The basic procedure employed for each estimator is a two step process. The first step is to geometrically link (multiply) N number of historic return relatives (1 + periodic return) to form an N-period wealth relative. This procedure is repeated until a sufficient number of N-period wealth relatives have been created to utilize all of the historical observed returns. The second step calculates the unbiased estimate of the expected N-period holding period return as the mean of the wealth relatives calculated in step one. Thus the unbiased estimator of the expected N-period holding period return is indeed the arithmetic mean of the historical observations as originally prescribed. The necessary symmetry between historic and expected return holding periods is accomplish by linking N number of single period historical returns where N is equal to the length of the expected holding period.

Others have proposed comparable procedures without the mathematical rigor. See for example, Russell J. Fuller, and Kent A. Hickman, "A Note on Estimating the Historical Risk Premium," Financial Practice and Education, Fall/Winter 1991, pp. 45-48. Sharpe and Alexander, p. 130 convey the same procedural approach by clearly stating that it is the arithmetic mean of holding period returns (wealth relative - 1) that yields the expected return. "Expected holding-period return is a weighted average of possible holding-period returns, using probabilities as weights (footnote omitted)."

[13] Various procedures are suggested for combining N number of historical returns into wealth relatives. One procedure is to geometrically link in chronological order the first N observed historic returns, then the next N returns and so forth until the end of the historical data is reached. When the number of historical periods T is not an integer multiple of the length of the desired holding period N then X number of historical observations are randomly discarded where X is equal to the remainder of T/N. A second suggested procedure for forming the historic holding period wealth relatives is to select N-number of historical returns from overlapping chronological periods. For example, the first wealth relative would be formed by geometrically linking observed returns 1 through N. The second wealth relative would be formed by geometrically linking observed returns 2 through N+1. N-period wealth relatives are formed in this manner until the historical return data is exhausted. Because the ending historical return observations are not utilized as many times as the beginning observations in the overlapping methodology a modification to this methodology which wraps around from the ending period to the starting period of the historical data is also proposed. By employing the wrap-around procedure all observations are used an equal number of times and estimator efficiency is increased. The wrap-around procedure is computationally equivalent to the overlapping procedure

estimator of expected return for a holding period of length N is found to be the arithmetic mean of the holding period returns formed from all possible combinations of the historical periodic returns taken N returns at a time without regard to the chronological order of the historic returns.[14] Consistent with conventional practice the N-period holding period return can be converted to a return per annum assuming periodic compounding by solving for the geometric mean of the holding period wealth relative (1 + holding period return).[15]

The combinatorial estimator avoids all of the biases described by Blume, and it reduces to the arithmetic and geometric mean in those instances where the arithmetic and geometric mean are the most efficient unbiased estimators. Consistent with Condition 1 when the length of the holding period utilized in calculating the historical returns equals the length of the expected holding period (N =1) the combinatorial estimator reduces to the simple average or arithmetic mean of

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except when a full N number of historical observations are not available before the end of the historical data is reached. In these instances a sufficient number of historic returns are selected from the beginning of the historic return series to provide the full N number of historic observations. Hasbrouck, (p. 459) observes that because the one period return relatives are independent by definition since they are assumed to be random variables, preservation of chronological order in developing N-period wealth relatives is not necessary. Consequently, Hasbrouck proposes that the maximum number of N-period wealth relatives, and hence the maximum efficiency, can be created by forming all possible combinations the historical observed returns taken N at a time without regard to their chronological sequence.

[14] The number of combinations for T observations taken N at a time is equal to

$$T! / N!(T-N)!$$

[15] See for example, Sharpe and Alexander, pp. 127-128.

the historical observations.[16] Consistent with Conditions 2 and 3, when the length of the expected holding period is greater than the period over which historic returns were calculated (N > 1), but less then the total number of historical periods employed (N < T) the combinatorial estimator is effectively a blend of the arithmetic and geometric means of the historical data. The blending effectively eliminates the upward bias of the arithmetic mean and the downward bias of the geometric mean by creating symmetry between historic and expected holding periods.[17] Finally, consistent with Condition 4 when the length of the expected holding period is equal to the number of historical observations (N = T) the combinatorial estimator reduces to the geometric mean of the historic one period returns.[18]

Blume's Unbiased Estimator

Unfortunately, the combinatorial estimator can produce huge numbers of holding period return combinations depending upon the values T and N assume. The

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[16] For example, the maximum number of 69 annual return observations taken one at a time is 69. Moreover each combination contains one distinct annual return. Consequently, the arithmetic mean of all possible combinations is also the arithmetic mean of the historical observations.

[17] The blend of the arithmetic and geometric means can be seen by examining the estimator procedure. First N-period holding period wealth relatives are calculated by geometrically linking (the geometric mean part of the blend) N-number of historic returns. The estimate of the expected holding period return is derived by taking the arithmetic mean (obviously the arithmetic mean part of the blend) of the wealth relatives.

[18] It is this aspect which explains why sources such as Kritzman, Ehrhardt, and Carleton and Lakonishok (Willard T. Carleton and Josef Lakonishok, "Risk and Return on Equity: The Use and Misuse of Historical Estimates," Financial Analysts Journal, January-February 1985, pp. 39), advise that the geometric mean is the best unbiased estimator of the expected holding period return under certain conditions.

number of holding period return combinations possible for holding periods ranging from 1 to 69 years and employing 69 years of annual return observations is provided in Exhibit 1. The actual sizes of T and N that are tractable for combinatorial estimation is dependent upon the computer resources available. However, employing the combinatorial estimator appears to be unreasonable when annual return data $T \leq 69$ years and holding period lengths $9 \leq N \leq T\text{-}9$ years.[19] Fortunately, Blume provides an unbiased estimator, which employs a weighted average of the arithmetic and geometric means of the historic data with the weights based upon the length of the expected holding period. Blume's estimator is as follows.[20]

$$\hat{E}(W_N) = \frac{T - N}{T - 1} A^N + \frac{N - 1}{T - 1} G^N$$

Where:

$\hat{E}(W_N)$ = expected N-period holding period wealth relative (1 + holding period return)

T = Number of historical periodic observations employed in the development of the arithmetic mean

[19] For example, full combinatorial estimates of expected holding period returns were developed for holding periods ranging from 1 to 7 years and employing 69 years of annual realized returns. The estimates took approximately 21 hours to compute on a Compaq 386 running at 20mhz clock speed. In contrast, the same calculations took 20 minutes on an Hewlett Packard Apollo 710. However, the calculation time jumps dramatically with each increment to the expected holding period length. The 8 year holding period took approximately 4 hours to calculate and the 9 year holding period took more than 28 hours to calculate on the same Hewlett Packard machine.

[20] Blume, pp. 636-637.

N	=	Length of holding period
A^N	=	Arithmetic mean of realized return relatives
G^N	=	Geometric mean of realized return relatives

Blume's weighted estimator provides a close approximation of the estimates obtained from the combinatorial estimator. Exhibit 2 provides the combinatorial estimated expected return and estimated expected returns generated by Blume's weighted estimator. It can be seen that the Blume's weighted estimator closely approximates the combinatorial estimator. Exhibit 2 also shows that, for holding periods of 5 years or less, the weighted estimator is very close to the arithmetic mean of annual historical observations.

To summarize:

(1) If realized holding period returns are random variables the arithmetic mean of the historical observations provides an unbiased estimate of expected holding period returns.

(2) Symmetry must be maintained between the length of the holding period utilized in calculating the historical returns and the length of the holding period for which the expected return estimate is desired.

(3) The most statistically efficient generalized procedure for ensuring symmetry is the combinatorial estimator.

(4) The combinatorial estimator reduces to the arithmetic mean of the historical observations if the length of the holding period utilized in calculation of the historical holding period returns equals the length of the holding period for which an expected return is desired.

(5) The combinatorial estimator reduces to the geometric mean of the historical return relatives when the length of the expected holding period is equal to the number of historical observations employed in the estimation.

(6) Blume's weighted combination of the arithmetic and geometric mean provides a workable approximation of the combinatorial estimator and can be confidently employed to produce unbiased expected holding period returns under all conditions without the computational burden of the combinatorial estimator.

(7) The shorter the expected holding period return, the closer the weighted combinatorial estimator is to the arithmetic mean of annual historical observations. For holding periods of 5 years or less, the

weighted combinatorial estimator is not significantly different from the arithmetic mean.

Expected Holding Period

Common stock securities have no stated maturity, and theoretically, the expected holding period for common stock investors could be indefinite. In practice, however, common stock investments are actively traded in the capital markets, indicating that investors have relatively short investment horizons or expected holding periods.[21]

Bernstein[22] observes that more than 70 percent of shares of common stock change hands each year. If 100 percent of shares changed hands each year, then the average holding period would be one year. If 50 percent of shares changed hands each year, then the average holding period would be two years. Mathematically, the average holding period is the reciprocal of the share turnover ratio:

$$AHP = 1/t$$

Where AHP = Average Holding Period

[21] "Stocks can be held almost indefinitely, and the average holding period is probably close to a year." Frank K. Reilly, Investment Analysis and Portfolio Management, 2nd Ed, Chicago, IL: The Dryden Press, 1985, p. 763.

[22] "More than 70 percent of all outstanding shares changes hands in the course of a year, up from only 20 percent or so in the 1970s." Peter L. Bernstein, Capital Ideas, New York: The Free Press, 1992, p. 4.

$$t = \text{Share Turnover}$$

$$t = \frac{\text{Shares Traded}}{\text{Shares Outstanding}}$$

The average holding period associated with the 70% turnover rate observed by Bernstein is 1.43 years [1/.70 = 1.43].

The expected holding period for common stock investors can be inferred from empirical analysis of share turnover and average holding periods. Exhibit 3 provides share turnover data for the S&P 500 stocks for 1990 to 1994 and shows that share turnover averaged 79.3% per year for an average holding period of 1.26 years. Exhibit 4 focuses on telecommunications companies and shows an average share turnover of 38.0% for an average holding period of 2.63 years.

Market trading data shows that the expected holding period for the market in general (as proxied by the S&P 500 stocks) is close to one year. For telecommunications industry stocks, the expected holding period is less than three years. As shown in Exhibit 2, both the combinatorial estimator and Blume's weighted estimator for holding periods of three years or less are not significantly different from the arithmetic mean of historical observations.

Summary

This appendix explains why the arithmetic mean of historical risk premiums should be used in calculating the expected equity risk premium. The technical explanation discusses the requirements for unbiased estimates of future expectations and examines the circumstances under which the arithmetic mean or a combination or weighting of arithmetic and geometric mean data is appropriate. The geometric mean will always produce a biased estimate of the expected holding period return except in the unlikely circumstance in which the length of the expected holding period is equal to the length of time spanned by the historical observations (in this case, 69 years). For expected holding periods of five years or less, the combinatorial or weighted estimator is not significantly different from the arithmetic mean of historical observations.

Stock market trading data indicates that the expected holding period is less than three years and the combinatorial or weighted estimator rounds to within one tenth of one percent of the arithmetic mean. Thus we can confidently employ the arithmetic mean of historical risk premiums to estimate the expected equity risk premium.

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POSSIBLE HOLDING PERIOD RETURN COMBINATIONS

Number of Historical Observations 69

LENGTH OF HOLDING PERIOD (YEARS)	COMBINATIONS
1	69
2	2,346
3	52,394
4	864,501
5	11,238,513
6	119,877,472
7	1,078,897,248
8	8,361,453,672
9	56,672,074,888
10	340,032,449,328
11	1,823,810,410,032
12	8,815,083,648,488
13	38,650,751,381,832
14	154,603,005,527,328
15	566,877,686,933,536
16	1,913,212,193,400,680
17	5,964,720,367,660,950
18	17,231,414,395,465,000
19	46,252,743,903,616,500
20	115,631,859,759,041,000
21	269,807,672,771,096,000
22	588,671,286,046,028,000
23	1,202,936,975,833,190,000
24	2,305,629,203,680,280,000
25	4,150,132,566,624,500,000
26	7,023,301,266,595,310,000
27	11,185,257,572,725,900,000
28	16,777,886,359,088,800,000
29	23,720,460,024,918,600,000
30	31,627,280,033,224,800,000
31	39,789,158,751,476,400,000
32	47,249,626,017,378,300,000
33	52,976,853,413,424,100,000
34	56,093,138,908,331,400,000
35	56,093,138,908,331,400,000
36	52,976,853,413,424,100,000
37	47,249,626,017,378,300,000
38	39,789,158,751,476,400,000
39	31,627,280,033,224,800,000
40	23,720,460,024,918,600,000
41	16,777,886,359,088,800,000
42	11,185,257,572,725,900,000
43	7,023,301,266,595,310,000
44	4,150,132,566,624,500,000
45	2,305,629,203,680,280,000

POSSIBLE HOLDING PERIOD RETURN COMBINATIONS

Number of Historical Observations 69

LENGTH OF HOLDING PERIOD (YEARS)	COMBINATIONS
46	1,202,936,975,833,190,000
47	588,671,286,046,028,000
48	269,807,672,771,096,000
49	115,631,859,759,041,000
50	46,252,743,903,616,500
51	17,231,414,395,465,000
52	5,964,720,367,660,950
53	1,913,212,193,400,680
54	566,877,686,933,536
55	154,603,005,527,328
56	38,650,751,381,832
57	8,815,083,648,488
58	1,823,810,410,032
59	340,032,449,328
60	56,672,074,888
61	8,361,453,672
62	1,078,897,248
63	119,877,472
64	11,238,513
65	864,501
66	52,394
67	2,346
68	69
69	1

COMPARISON OF THE COMBINATORIAL ESTIMATES AND BLUME'S WEIGHTED ESTIMATOR

NUMBER OF HISTORICAL OBSERVATIONS	69
ARITHMETIC MEAN OF OBSERVATIONS	0.12162
GEOMETRIC MEAN OF OBSERVATIONS	0.10194

	ESTIMATES OF EXPECTED RETURNS		
LENGTH OF HOLDING PERIOD (YEARS)	COMBINATORIAL ESTIMATOR	BLUME'S WEIGHTED ESTIMATOR	DIFFERENCE
1	0.12162	0.12162	0.00000
2	0.12135	0.12133	0.00002
3	0.12108	0.12104	0.00004
4	0.12081	0.12075	0.00006
5	0.12054	0.12046	0.00008
6	0.12027	0.12017	0.00010
7	0.12000	0.11988	0.00012
8	0.11973	0.11959	0.00014
9	0.11946	0.11930	0.00016
10	0.11919	0.11902	0.00017

APPENDIX I
Exhibit 2

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
ABBOTT LABORATORIES	ABT	803.280	821.130	836.052	425.265	429.141	283.245	327.800	311.983	151.759	178.618
ADVANCED MICRO DEVICES	AMD	95.417	92.444	88.226	84.031	82.338	263.747	303.325	304.317	262.798	111.683
AETNA LIFE & CASUALTY CO	AET	112.658	112.201	110.270	110.065	110.113	76.702	62.987	62.856	81.338	68.587
AHMANSON (H F) & CO	AHM	117.113	116.880	116.649	116.258	115.946	71.639	71.514	72.739	71.797	74.197
AIR PRODUCTS & CHEMICALS INC	APD	113.409	114.152	113.366	56.200	55.700	58.197	65.431	57.116	31.176	39.924
ALBERTO-CULVER CO -CL B	ACV	27.680	28.365	28.547	28.239	28.500	4.414	4.215	4.385	5.855	3.812
ALBERTSONS INC	ABS	253.984	253.407	132.329	132.131	133.820	92.724	133.882	52.725	64.074	45.436
ALCAN ALUMINIUM LTD	AL	224.685	224.060	223.807	223.420	222.667	122.744	93.351	71.999	102.507	146.608
ALCO STANDARD CORP	ASN	54.448	46.964	45.949	44.638	40.887	31.499	32.178	21.436	19.245	12.286
ALEXANDER & ALEXANDER	AAL	44.200	43.500	41.000	40.800	40.600	28.847	18.568	19.305	19.917	18.282
ALLERGAN INC	AGN	63.663	63.983	66.790	67.305	66.962	30.958	25.552	29.389	40.029	47.509
ALLIEDSIGNAL INC	ALD	283.132	141.917	141.883	138.150	134.688	137.270	80.845	95.083	89.250	63.969
ALUMINUM CO OF AMERICA	AA	89.356	88.361	85.730	85.082	84.842	109.969	82.489	83.706	71.446	110.111
ALZA CORP	AZA	82.043	81.614	74.855	72.082	32.390	89.363	124.029	70.546	67.269	31.007
AMDAHL CORP	AMH	116.636	114.578	113.139	111.231	110.178	80.366	83.472	102.871	72.737	77.693
AMERADA HESS CORP	AHC	92.996	92.587	92.584	81.068	81.019	59.137	57.465	72.606	51.364	61.085
AMERICAN BRANDS INC/DE	AMB	201.211	201.744	202.577	203.918	200.357	85.689	117.417	72.338	92.794	107.486
AMERICAN CYANAMID CO	ACY		89.834	90.074	91.625	93.413		67.713	61.843	75.446	86.714
AMERICAN ELECTRIC POWER	AEP	185.235	184.535	184.535	184.535	184.535	89.355	68.249	65.387	70.296	71.144
AMERICAN EXPRESS	AXP	495.866	489.828	479.976	472.166	464.474	396.298	374.012	324.728	420.346	315.301
AMERICAN GENERAL CORP	AGC	203.052	214.158	108.129	108.831	111.275	88.065	91.235	39.330	49.861	130.629
AMERICAN GREETINGS -CL A	AGREA	74.302	74.119	36.451	35.884	31.609	99.114	101.553	50.145	51.496	44.650
AMERICAN HOME PRODUCTS CORP	AHP	305.981	310.326	313.048	315.623	314.028	116.965	133.872	135.286	125.267	108.601
AMERICAN INTERNATIONAL GROUP	AIG	315.841	317.628	211.629	212.270	212.143	123.351	131.070	90.556	82.833	97.565
AMERICAN STORES CO	ASC	142.971	71.252	70.930	69.265	34.538	80.904	36.351	33.225	43.764	20.128
AMERITECH CORP	AIT	551.462	273.322	270.172	266.633	264.326	133.313	86.990	56.561	58.619	62.317
AMGEN INC	AMGN	132.328	134.214	136.321	131.864	42.220	350.214	499.953	329.466	504.994	178.109
AMOCO CORP	AN	496.393	496.401	496.303	496.335	501.964	178.200	169.251	160.115	139.653	172.206
AMP INC	AMP	104.818	104.906	104.930	106.054	105.951	58.646	53.264	55.286	48.933	63.033
AMR CORP/DE	AMR	75.900	75.800	75.400	68.000	62.300	119.157	157.056	161.221	127.715	126.977
ANDREW CORP	ANDW	25.545	16.795	8.163	9.556	9.625	46.537	34.572	13.012	9.584	9.534
ANHEUSER-BUSCH COS INC	BUD	257.290	267.037	278.402	285.052	282.306	105.959	135.552	109.236	102.088	109.314
APPLE COMPUTER INC	AAPL	119.543	116.147	118.479	118.386	115.359	510.283	504.336	367.900	513.410	396.250
ARCHER-DANIELS-MIDLAND CO	ADM	312.418	316.951	303.314	288.689	283.754	147.803	154.900	162.199	175.323	165.109
ARMCO INC	AS	105.089	104.123	103.512	88.486	88.495	61.350	80.878	54.447	49.347	54.357
ARMSTRONG WORLD INDS INC	ACK	37.277	37.222	37.128	37.103	37.092	44.154	31.992	29.643	29.109	33.146
ASARCO INC	AR	42.102	41.718	41.467	41.249	41.058	51.664	37.677	36.477	24.809	24.544
ASHLAND INC	ASH	61.000	60.022	59.948	59.879	57.803	54.781	40.419	31.324	26.804	30.817
AT&T CORP	T	1,569.006	1,352.398	1,339.831	1,309.352	1,092.143	514.170	471.191	428.910	457.365	416.450

APPENDIX I
Exhibit 3

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
ATLANTIC RICHFIELD CO	ARC	160.754	159.954	158.922	157.627	158.913	91.275	82.917	65.685	78.461	78.106
AUTODESK INC	ACAD	47.241	23.740	24.011	24.588	24.412	205.374	131.250	105.466	115.634	70.003
AUTOMATIC DATA PROCESSING	AUD	140.699	141.119	140.151	138.227	73.826	59.095	62.263	54.041	58.807	45.068
AVERY DENNISON CORP	AVY	53.550	56.194	58.874	61.253	61.981	29.239	23.197	27.045	29.297	39.258
AVON PRODUCTS	AVP	69.074	72.099	71.966	71.780	56.899	61.461	70.640	56.420	103.452	66.890
BAKER-HUGHES INC	BHI	140.889	140.437	138.624	138.396	137.457	158.660	158.456	159.779	142.118	131.612
BALL CORP	BLL	29.867	29.447	26.429	25.768	22.092	20.242	22.265	16.408	14.254	6.669
BALLY ENTMT CORP	BLY	46.991	46.876	45.986	36.448	31.015	49.084	96.769	63.222	47.306	70.329
BALTIMORE GAS & ELECTRIC	BGE	147.527	146.034	143.784	84.460	83.359	65.235	50.355	49.198	31.869	39.989
BANC ONE CORP	ONE	396.986	346.079	232.082	167.818	158.835	243.384	180.406	112.009	69.470	63.280
BANK OF BOSTON CORP	BKB	106.547	105.801	84.732	75.230	73.729	102.455	130.455	137.138	128.688	111.754
BANKAMERICA CORP	BAC	371.182	357.912	348.603	218.880	213.364	272.618	309.020	256.770	260.682	212.653
BANKERS TRUST NEW YORK CORP	BT	78.069	80.603	82.874	82.419	80.924	79.520	55.848	50.731	66.406	59.382
BARD (C.R.) INC	BCR	52.048	52.098	52.839	53.019	53.044	39.765	56.194	40.695	61.850	66.604
BARNETT BANKS INC	BBI	96.733	97.404	96.643	69.518	63.281	66.917	70.640	61.349	61.101	54.391
BARRICK GOLD CORPORATION	ABX	353.300	286.514	141.890	140.919	133.993	319.424	327.860	79.968	61.375	76.828
BASSETT FURNITURE INDS	BSET	14.087	14.448	11.535	7.678	7.715	7.837	8.980	6.884	1.520	1.929
BAUSCH & LOMB INC	BOL	58.992	59.118	59.444	59.481	29.589	77.388	46.344	36.184	38.620	22.693
BAXTER INTERNATIONAL INC	BAX	282.310	276.514	279.333	279.200	279.108	161.847	232.695	152.981	154.786	200.486
BECTON DICKINSON & CO	BDX	70.278	74.727	37.980	37.741	37.641	44.479	41.745	23.589	38.873	26.158
BELL ATLANTIC CORP	BEL	436.186	436.080	433.969	396.051	393.191	125.970	136.161	134.770	103.132	103.861
BELLSOUTH CORP	BLS	496.243	496.087	493.793	486.698	481.972	134.494	102.872	106.266	88.838	100.221
BEMIS CO	BMS	51.211	51.201	51.152	23.265	25.459	14.199	14.298	14.084	7.744	6.049
BENEFICIAL CORP	BNL	52.510	52.170	25.969	25.885	22.415	21.516	28.459	13.774	14.516	14.376
BETHLEHEM STEEL CORP	BS	109.885	91.409	90.509	76.380	75.867	162.869	160.744	83.039	76.863	58.450
BEVERLY ENTERPRISES	BEV	85.649	81.868	74.329	73.630	65.972	108.008	128.508	95.948	108.506	100.425
BIOMET INC	BMET	115.188	114.424	115.288	113.462	56.189	103.714	147.503	177.535	165.604	98.544
BLACK & DECKER CORP	BDK	84.689	83.845	83.428	61.861	61.621	84.773	73.268	114.475	84.784	78.407
BLOCK H & R INC	HRB	104.863	106.149	106.355	106.598	53.243	81.149	59.985	56.084	48.829	25.198
BLOCKBUSTER ENMNT CORP	BV		247.380	190.730	162.101	74.584		233.461	228.227	311.813	88.569
BOATMENS BANCSHARES INC	BOAT	104.322	104.126	48.278	37.977	34.691	80.875	87.102	34.932	29.535	24.708
BOEING CO	BA	340.879	340.138	339.420	341.288	343.574	207.996	240.211	291.991	319.679	317.844
BOISE CASCADE CORP	BCC	38.284	37.988	37.940	37.945	37.949	43.961	36.684	26.757	31.875	38.212
BORDEN INC	BN	169.859	141.358	140.641	147.484	147.271	196.281	166.851	84.090	80.015	67.512
BRIGGS & STRATTON	BGG	14.464	14.464	14.464	14.464	14.464	13.903	11.809	10.337	10.579	8.711
BRISTOL MYERS SQUIBB	BMY	507.286	511.906	517.984	519.517	523.819	235.998	376.576	334.116	258.154	254.734
BROWN GROUP INC	BG	17.970	17.620	17.319	17.312	17.264	7.018	7.487	7.590	7.690	8.424
BROWN-FORMAN -CL B	BF.B	68.996	22.999	27.555	27.555	27.644	13.135	5.539	5.177	4.434	5.120
BROWNING-FERRIS INDS	BFI	196.341	173.545	168.629	152.854	152.697	146.712	114.157	114.034	138.078	141.391

APPENDIX I
Exhibit 3

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
BRUNOS INC	3BRNO	78.090	78.047	81.890	81.768	81.589	63.380	75.011	62.996	78.293	32.561
BRUNSWICK CORP	BC	95.451	95.257	95.132	88.600	88.300	85.469	51.839	66.601	75.619	40.610
BURLINGTON NORTHRN INC	BNI	89.224	88.796	88.024	87.356	76.184	91.222	82.019	86.161	90.099	65.456
BURLINGTON RESOURCES INC	BR	126.509	129.683	128.881	131.442	137.945	80.692	96.266	79.837	87.132	89.978
CAMPBELL SOUP CO	CPB	248.000	251.700	251.168	127.004	129.269	56.354	55.663	68.082	40.701	49.523
CAPITAL CITIES/ABC INC	CCB	154.058	15.383	16.444	16.639	16.759	74.571	7.029	6.058	7.576	7.800
CAROLINA POWER & LIGHT	CPL	156.382	160.737	80.368	80.368	80.368	53.752	61.362	32.501	24.712	35.429
CATERPILLAR INC	CAT	200.442	101.862	100.952	100.912	100.906	230.806	94.968	80.140	75.698	94.114
CBS INC	CBS	61.307	15.484	13.454	13.218	23.685	80.214	15.895	15.927	12.922	14.777
CENTEX CORP	CTX	28.071	31.664	31.141	15.262	15.050	50.254	35.738	39.706	12.565	13.387
CENTRAL & SOUTH WEST CORP	CSR	190.251	188.405	188.371	94.137	94.102	86.622	67.205	70.528	33.241	48.864
CERIDIAN CORP	CEN	45.402	44.182	42.804	42.530	42.530	48.248	29.579	37.010	26.573	34.410
CHAMPION INTERNATIONAL CORP	CHA	93.294	93.026	92.880	92.920	92.968	67.670	43.769	49.685	67.287	73.912
CHARMING SHOPPES	CHRS	102.894	102.735	102.448	50.805	50.070	127.119	256.410	233.573	111.806	54.788
CHASE MANHATTAN CORP	CMB	177.174	184.290	156.096	139.858	131.694	196.099	240.067	206.789	196.070	244.722
CHEMICAL BANKING CORP	CHL	244.512	252.882	246.808	183.466	91.402	241.440	262.273	287.611	131.459	122.362
CHEVRON CORP	CHV	651.751	325.739	325.174	346.722	350.800	275.181	148.396	114.494	103.619	135.259
CHRYSLER CORP	C	355.059	353.728	295.900	292.300	224.800	571.433	563.616	427.748	194.520	162.907
CHUBB CORP	CB	86.821	87.709	87.520	86.938	81.912	57.364	57.140	62.677	55.597	71.150
CIGNA CORP	CI	72.225	72.015	71.720	71.563	71.313	53.527	41.049	37.896	40.580	46.429
CINCINNATI MILACRON INC	CMZ	33.700	33.532	27.506	27.372	27.303	20.981	32.866	15.811	16.354	10.757
CIRCUIT CITY STORES INC	CC	96.476	96.080	47.835	46.933	46.340	136.432	142.400	63.257	67.376	61.117
CISCO SYSTEMS INC	CSCO	257.697	123.708	60.111	28.519	13.386	1,111.390	607.039	276.067	180.593	41.202
CITICORP	CCI	395.081	386.490	366.489	346.250	336.513	458.222	535.207	453.486	409.699	413.568
CLARK EQUIPMENT CO	CKL	17.401	17.402	17.351	17.311	17.249	21.832	21.309	14.079	13.884	13.846
CLOROX CO/DE	CLX	53.372	54.850	54.545	54.196	54.032	22.061	26.373	28.051	25.518	24.292
CNA FINANCIAL CORP	CNA	61.798	61.798	61.798	61.793	61.793	12.817	4.757	4.707	5.344	7.667
COASTAL CORP	CGP	104.746	104.520	103.997	103.747	103.584	66.444	66.346	78.486	79.274	51.872
COCA-COLA CO	KO	1,275.933	1,297.453	1,306.771	664.480	668.239	400.966	360.695	419.914	205.805	260.725
COLGATE-PALMOLIVE CO	CL	144.404	149.257	160.240	147.343	66.604	104.682	130.569	81.206	90.618	50.122
COLUMBIA GAS SYSTEM	CG	50.563	50.559	50.559	50.559	50.472	30.372	34.403	35.757	82.755	31.772
COLUMBIA/HCA HLTHCR -VTG	COL	361.968	336.677	25.815	18.473	56.600	274.248	88.987	20.832	15.950	7.377
COMCAST CORP -CL A SPL	CMCSK	239.037	147.791	135.606	128.775	113.257	327.988	138.444	74.679	50.466	56.651
COMMONWEALTH EDISON CO	UCM1	214.191	213.751	213.305	212.677	212.285	66.583	101.389	155.118	110.253	109.690
COMMUNITY PSYCHIATRIC CNTRS	CMY	43.591	43.093	43.025	46.190	46.633	68.783	46.840	52.811	102.413	55.951
COMPAQ COMPUTER CORP	CPQ	261.037	84.348	79.829	84.202	86.090	784.406	272.171	237.967	272.652	270.231
COMPUTER ASSOCIATES INTL INC	CA	160.138	163.049	167.831	177.336	182.013	183.193	138.458	162.540	160.825	164.906
COMPUTER SCIENCES CORP	CSC	55.171	50.606	16.621	16.407	16.111	40.735	37.921	14.833	19.455	15.525
CONAGRA INC	CAG	245.698	248.195	251.710	231.963	139.674	103.937	97.907	122.886	106.190	51.462

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COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
CONRAIL INC	CRR	78.620	79.575	79.742	41.050	40.638	81.103	79.964	100.369	55.385	58.336
CONSOLIDATED EDISON OF NY	ED	234.905	234.373	233.932	228.325	228.232	100.487	69.482	79.844	98.671	83.280
CONSOLIDATED FREIGHTWAYS INC	CNF	36.354	35.702	35.329	35.090	35.001	50.111	34.266	27.197	43.851	52.594
CONSOLIDATED NATURAL GAS CO	CNG	93.028	92.934	92.557	87.322	86.327	40.515	30.046	35.803	22.771	21.835
CONTINENTAL CORP	CIC		55.331	54.926	54.653	54.388	64.069	39.470	42.275	33.131	41.041
COOPER INDUSTRIES INC	CBE	116.923	114.180	113.401	112.202	109.707	87.406	56.596	67.291	48.130	54.010
COOPER TIRE & RUBBER	CTB	83.634	83.582	83.511	41.481	41.259	51.427	95.131	48.007	24.477	34.248
COORS (ADOLPH) -CL B	ACCOB	38.327	38.199	37.727	37.482	37.384	24.164	29.486	25.873	34.807	41.330
CORESTATES FINANCIAL CORP	CFL	144.900	117.319	58.400	54.800	54.300	68.828	130.933	69.619	72.682	72.634
CORNING INC	GLW	228.200	200.636	193.898	96.783	91.855	108.716	130.469	118.994	41.653	42.591
CPC INTERNATIONAL INC	CPC	146.761	149.817	150.636	75.626	75.456	74.131	67.494	70.320	44.984	35.839
CRANE CO	CR	30.047	29.863	29.958	30.743	31.244	12.559	12.478	10.830	15.979	10.584
CRAY RESEARCH	CYR	25.470	25.980	26.047	26.592	26.163	38.272	27.983	33.738	30.041	39.278
CROWN CORK & SEAL CO INC	CCK	89.360	88.815	86.348	29.029	28.850	50.748	46.667	37.850	13.068	14.512
CSX CORP	CSX	104.722	104.143	103.476	102.378	98.540	59.165	62.078	59.414	59.904	42.067
CUMMINS ENGINE	CUM	41.600	38.500	17.219	14.842	14.836	42.017	53.076	20.636	13.405	9.580
CYPRUS AMAX MINERALS CO	CYM	92.566	91.536	47.293	39.034	38.934	98.844	74.031	50.273	30.095	27.904
DANA CORP	DCN	98.800	49.200	45.919	41.110	41.013	66.350	29.467	32.108	15.389	14.632
DATA GENERAL CORP	DGN	36.457	35.267	33.553	31.903	30.707	39.496	33.734	56.139	84.423	27.008
DAYTON HUDSON CORP	DH	71.690	71.525	71.384	71.235	71.062	76.374	67.507	74.983	68.461	64.087
DEAN WITTER DISCOVER & CO	DWD	168.900	170.600	165.675			115.808	130.332			
DEERE & CO	DE	86.421	85.502	76.321	76.235	76.107	129.003	102.972	71.797	79.574	105.685
DELTA AIR LINES INC	DAL	50.453	50.064	49.699	49.402	46.086	65.653	84.641	80.572	71.958	62.940
DELUXE CORP	DLX	82.375	82.549	83.797	83.938	84.075	44.241	41.832	26.831	32.222	24.888
DETROIT EDISON CO	DTE	144.863	147.048	147.017	146.983	146.922	86.306	66.415	57.957	54.531	73.997
DIAL CORP/DE	DL	92.789	46.018	46.907	40.145	39.257	70.133	26.625	28.642	23.508	27.310
DIGITAL EQUIPMENT	DEC	142.287	134.992	127.815	124.623	122.555	282.191	164.001	172.722	165.770	158.571
DILLARD DEPT STORES -CL A	DDS	113.046	112.992	112.522	37.191	36.954	115.699	110.005	105.744	31.948	19.333
DISNEY (WALT) COMPANY	DIS	524.100	535.500	524.400	130.200	131.800	302.424	358.429	448.683	114.981	140.210
DOMINION RESOURCES INC	D	172.405	168.123	163.843	105.901	103.193	65.951	46.648	47.915	39.210	50.185
DONNELLEY (R R) & SONS CO	DNY	153.085	154.158	155.029	77.675	77.465	53.403	51.602	45.277	27.436	26.790
DOVER CORP	DOV	56.730	57.163	57.085	58.978	59.971	22.362	17.390	17.031	24.225	25.831
DOW CHEMICAL	DOW	277.123	274.486	272.589	270.708	269.990	184.070	139.930	126.325	147.569	187.142
DOW JONES & CO INC	DJ	96.624	99.784	100.603	101.118	100.878	47.439	36.497	33.970	21.738	24.362
DRESSER INDUSTRIES INC	DI	183.852	137.613	136.927	134.304	135.574	140.246	129.255	108.827	117.338	121.936
DSC COMMUNICATIONS CORP	DIGI	113.525	55.018	44.115	41.675	40.695	594.261	331.837	157.856	116.384	132.981
DU PONT (E I) DE NEMOURS	DD	681.005	677.577	675.008	671.242	669.848	267.761	215.857	210.405	213.476	213.757
DUKE POWER CO	DUK	204.859	204.859	204.859	204.700	202.584	75.078	50.469	57.325	65.928	86.702
DUN & BRADSTREET CORP	DNB	169.761	170.282	178.235	178.450	178.622	63.293	69.422	56.606	66.869	91.115

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COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
E-SYSTEMS INC	ESY	34.071	33.885	32.892	32.417	31.205	26.208	25.955	20.138	28.023	20.269
EASTERN ENTERPRISES	EFU	20.411	20.930	22.621	22.543	22.504	10.773	13.393	13.822	11.637	12.034
EASTMAN KODAK CO	EK	339.757	330.566	325.916	324.933	324.638	271.407	390.101	220.421	227.932	248.946
EATON CORP	ETN	77.967	71.304	34.667	34.069	33.948	49.437	37.333	21.781	17.537	15.949
ECHLIN INC	ECH	59.084	58.835	56.213	55.846	55.816	52.261	42.740	50.120	33.616	28.285
ECHO BAY MINES LTD	ECO	112.682	112.213	105.169	105.146	99.117	166.522	268.976	72.337	78.686	88.763
ECOLAB INC	ECL	67.671	31.555	31.526	31.224	23.595	18.105	7.854	12.034	13.179	15.086
EG&G INC	EGG	55.124	56.132	56.813	28.248	28.088	28.933	29.953	28.424	13.281	14.887
EMERSON ELECTRIC CO	EMR	223.586	224.763	224.308	224.069	223.328	83.197	80.716	71.683	75.683	88.930
ENGELHARD CORP	EC	95.098	95.946	65.685	44.835	44.543	59.724	42.410	26.963	20.621	15.741
ENRON CORP	ENE	251.675	249.095	118.592	101.218	50.446	124.584	128.775	62.841	50.277	20.476
ENSERCH CORP	ENS	66.954	66.656	66.034	65.302	64.764	43.997	42.393	39.175	41.030	31.791
ENTERGY CORP	ETR	227.409	231.220	175.135	178.809	185.257	171.543	85.207	95.627	93.144	102.246
ETHYL CORP	EY	118.434	118.405	118.358	118.317	118.325	76.528	54.168	49.959	44.345	44.026
EXXON CORP	XON	1,242.000	1,242.000	1,242.000	1,241.977	1,245.392	302.743	275.790	260.372	278.516	294.909
FED HOME LOAN MTG CO	FRE	180.762	180.536	180.333	60.020	60.036	103.422	108.875	130.940	55.298	79.813
FEDDERS CORP	FJC	21.255	20.227	18.455	18.439	18.436	24.839	21.290	20.481	26.573	25.323
FEDERAL EXPRESS CORP	FDX	56.159	55.875	54.742	54.099	53.632	59.336	51.018	57.888	40.767	55.280
FEDERAL NATL MORTGAGE ASSN	FNM	272.802	272.450	273.288	272.988	238.272	204.116	188.287	199.807	262.663	323.558
FEDERAL PAPER BOARD CO	FBO	42.573	42.147	41.952	40.675	40.164	41.666	35.285	41.902	50.615	28.808
FIRST CHICAGO CORP	FNB	89.860	86.399	82.331	68.804	66.006	86.792	79.554	84.615	59.272	70.711
FIRST FID BANCORPORATION	FFB	80.983	79.901	74.108	70.339	59.627	38.793	45.792	33.640	30.305	43.243
FIRST INTERSTATE BNCP	I	74.203	77.326	75.185	62.783	62.181	90.529	89.683	97.840	75.520	89.764
FIRST MISSISSIPPI CORP	FRM	20.086	19.980	19.824	19.649	19.649	21.141	12.375	14.803	8.810	11.551
FIRST UNION CORP (N C)	FTU	176.034	170.338	136.052	121.064	109.173	81.457	107.650	93.295	68.017	50.219
FLEET FINANCIAL GROUP INC	FLT	135.024	137.382	123.380	120.562	110.158	122.431	95.178	59.118	66.506	63.472
FLEETWOOD ENTERPRISES	FLE	46.062	45.996	45.667	22.803	21.893	37.108	49.902	56.860	20.358	13.897
FLEMING COMPANIES INC	FLM	37.480	36.940	36.698	35.433	30.548	32.942	27.506	32.800	30.907	24.521
FLUOR CORP	FLR	82.508	82.093	81.480	81.112	80.390	88.779	57.399	58.765	94.281	76.978
FMC CORP	FMC	36.515	36.181	35.873	35.270	34.763	16.769	17.640	16.768	14.339	13.820
FORD MOTOR CO	F	1,023.000	499.000	489.500	483.300	473.100	832.457	380.893	395.745	276.260	218.590
FOSTER WHEELER CORP	FWC	35.813	35.687	35.636	35.570	35.445	36.667	27.147	24.896	34.946	32.236
FOXMEYER HEALTH CORP	FOX	16.432	12.870	19.697	20.587	21.765	9.663	11.069	7.841	15.381	17.565
FPL GROUP INC	FPL	186.571	190.066	182.788	170.756	161.065	113.332	92.131	77.515	79.537	64.061
GANNETT CO	GCI	139.767	146.967	144.402	143.753	158.991	90.183	69.586	54.787	67.427	67.248
GAP INC	GPS	144.765	145.249	144.185	142.523	70.632	191.999	144.996	194.692	133.389	78.890
GENERAL DYNAMICS CORP	GD	62.996	31.282	30.921	41.914	41.672	43.952	21.820	42.237	42.014	22.374
GENERAL ELECTRIC CO	GE	1,705.967	853.651	855.429	864.122	873.120	574.030	261.289	271.357	360.437	396.421
GENERAL MILLS INC	GIS	157.900	158.500	160.500	165.500	165.100	96.173	75.757	67.113	61.735	86.519

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COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
GENERAL MOTORS CORP	GM	754.346	720.105	706.832	620.967	605.592	702.355	586.665	537.684	363.649	294.035
GENERAL RE CORP	GRN	81.872	83.631	84.715	86.641	87.194	53.280	45.767	53.214	46.585	48.079
GENERAL SIGNAL CORP	GSX	47.100	47.343	19.748	19.341	19.262	36.195	27.881	12.920	12.151	13.945
GENESCO INC	GCO	24.344	24.304	23.169	22.845	22.675	22.346	28.222	16.170	13.349	14.112
GENUINE PARTS CO	GPC	122.627	124.282	114.577	76.279	76.357	35.394	35.278	36.281	30.484	31.143
GEORGIA-PACIFIC CORP	GP	90.466	90.269	88.111	87.421	86.704	113.801	93.539	89.187	74.306	66.869
GERBER PRODUCTS CO	GEB		69.378	72.060	37.196	37.393		51.370	58.870	21.334	29.512
GIANT FOOD INC -CL A	GFS.A	59.254	59.587	59.690	59.620	58.979	18.708	16.636	20.868	21.850	16.143
GIDDINGS & LEWIS INC/WI	GIDL	34.294	34.254	30.365	13.149	10.661	67.619	70.333	84.034	24.048	19.187
GILLETTE CO	G	221.450	220.890	220.169	219.179	97.218	104.695	137.617	112.470	156.690	93.727
GOLDEN WEST FINANCIAL CORP	GDW	58.590	63.929	63.925	63.499	63.330	29.175	31.503	28.486	37.678	41.779
GOODRICH (B F) CO	GR	25.790	25.644	25.619	25.398	25.343	19.267	22.281	32.752	22.409	20.409
GOODYEAR TIRE & RUBBER CO	GT	151.407	150.516	72.244	70.664	58.478	158.728	142.831	96.314	98.503	66.448
GRACE (W R) & CO	GRA	94.083	93.465	89.892	88.603	86.052	41.425	57.546	77.358	70.598	56.032
GRAINGER (W W) INC	GWW	50.750	50.685	52.376	52.913	27.054	25.600	23.331	23.729	26.049	11.609
GREAT ATLANTIC & PAC TEA CO	GAP	38.220	38.220	38.220	38.216	38.211	10.184	14.254	23.910	15.831	14.989
GREAT LAKES CHEMICAL CORP	GLK	67.297	71.275	71.410	35.462	35.222	67.741	45.146	48.435	21.558	19.739
GREAT WESTERN FINANCIAL	GWF	134.316	132.616	130.814	128.876	128.537	96.154	129.174	90.933	94.802	105.577
GRUMMAN CORP	GQ		34.049	33.519	33.265	32.798		22.817	11.380	14.964	14.939
GTE CORP	GTE	965.085	951.762	939.530	888.907	669.392	357.355	292.909	287.960	298.456	242.835
HALLIBURTON CO	HAL	114.100	114.100	107.200	107.000	106.800	114.638	117.537	126.827	128.065	113.929
HANDLEMAN CO	HDL	33.533	33.411	33.218	33.276	32.976	19.706	26.362	21.479	32.800	23.329
HARCOURT GENERAL INC	H	77.887	77.307	76.292	75.160	69.589	38.958	38.388	42.385	30.317	23.203
HARLAND (JOHN H.) CO	JH	30.439	30.486	34.049	36.570	37.354	16.490	14.610	17.365	18.050	17.671
HARNISCHFEGER INDUSTRIES INC	HPH	29.946	27.950	27.966	29.993	31.696	31.003	23.481	22.596	23.847	40.689
HARRAHS ENTERTAINMENT INC	HET	102.403	102.258	33.946	33.745	26.598	183.155	177.075	31.358	35.180	27.978
HARRIS CORP	HRS	39.298	39.604	39.141	38.886	40.101	28.669	26.706	24.825	28.946	29.292
HARTMARX CORP	HMX	32.478	31.951	25.907	25.361	20.040	10.181	15.904	25.740	15.527	14.115
HASBRO INC	HAS	87.528	87.795	87.176	57.456	56.496	69.150	60.049	51.704	44.054	30.002
HEINZ (H J) CO	HNZ	243.676	249.041	254.365	254.057	259.435	113.684	99.433	112.967	114.758	74.400
HELMERICH & PAYNE	HP	24.710	24.637	24.576	24.487	24.485	12.664	15.815	12.114	17.738	17.242
HERCULES INC	HPC	38.878	40.837	43.522	46.693	46.962	34.138	31.997	33.451	37.428	27.195
HERSHEY FOODS CORP	HSY	86.735	87.613	90.186	90.186	90.186	31.521	29.341	24.384	27.273	31.025
HEWLETT-PACKARD CO	HWP	254.827	252.713	250.824	251.547	244.085	206.573	191.962	215.244	180.391	147.235
HILTON HOTELS CORP	HLT	48.100	47.800	47.700	47.500	47.500	47.986	39.705	30.135	44.589	84.057
HOME DEPOT INC	HD	453.365	449.364	332.697	211.112	118.066	288.541	381.109	280.133	195.673	138.577
HOMESTAKE MINING	HM	137.785	137.494	136.772	99.474	99.128	200.823	245.886	104.355	81.812	95.718
HONEYWELL INC	HON	127.255	131.560	136.680	69.828	70.781	81.762	92.237	82.700	53.379	92.826
HOUSEHOLD INTERNATIONAL INC	HI	96.603	94.448	41.438	39.777	35.798	64.877	57.163	26.220	36.258	39.921

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
HOUSTON INDUSTRIES INC	HOU	131.297	130.659	129.514	129.514	128.171	77.580	58.265	60.334	78.196	67.992
ILLINOIS TOOL WORKS	ITW	113.958	113.150	56.007	55.718	54.805	35.141	30.139	15.126	18.794	18.625
INCO LTD	N	117.183	110.270	109.292	106.247	104.438	104.430	59.685	48.096	49.667	62.671
INGERSOLL-RAND CO	IR	105.496	105.267	104.604	51.860	51.725	57.422	66.257	59.592	35.048	43.051
INLAND STEEL INDUSTRIES INC	IAD	44.550	41.087	35.247	30.958	30.886	51.995	33.824	24.642	22.600	24.212
INTEL CORP	INTC	413.000	418.000	209.292	203.923	199.651	1,184.140	1,462.450	545.702	550.299	471.264
INTERGRAPH CORP	INGR	44.785	45.355	47.558	47.791	47.529	39.946	41.791	67.338	114.765	81.705
INTERPUBLIC GROUP OF COS	IPG	77.704	74.851	75.062	37.713	36.738	31.362	50.149	33.192	17.164	17.799
INTL BUSINESS MACHINES CORP	IBM	587.710	581.386	571.436	571.018	571.391	602.984	579.551	510.865	439.062	402.999
INTL FLAVORS & FRAGRANCES	IFF	111.464	37.353	38.421	38.165	38.167	37.886	15.639	13.220	18.671	19.114
INTL PAPER CO	IP	125.895	123.888	122.662	112.454	109.709	131.672	105.413	115.528	110.771	97.379
ITT CORP	ITT	105.672	117.561	119.059	114.422	114.168	92.412	64.702	76.273	62.549	73.500
JAMES RIVER CORP OF VIRGINIA	JR	81.695	81.628	81.578	81.504	81.295	60.368	40.564	35.079	55.216	43.939
JEFFERSON-PILOT CORP	JP	48.451	49.464	50.439	34.195	34.523	16.917	16.130	20.399	14.025	12.494
JOHNSON & JOHNSON	JNJ	643.010	642.981	655.396	333.166	333.076	299.490	352.410	312.441	184.625	173.338
JOHNSON CONTROLS INC	JCI	40.700	40.500	40.100	39.600	39.400	23.078	18.717	19.970	19.614	19.733
JOSTENS INC	JOS	45.482	45.425	41.145	40.875	40.066	26.635	37.881	27.769	21.379	14.129
K MART CORP	KM	458.667	409.078	406.883	201.767	199.849	372.980	347.540	272.731	153.044	121.973
KAUFMAN & BROAD HOME	KBH	32.378	34.724	34.611	28.765	27.722	54.102	41.854	58.481	35.797	22.948
KELLOGG CO	K	221.701	227.920	237.318	240.463	120.658	70.380	80.243	60.763	71.151	38.562
KERR-MCGEE CORP	KMG	51.694	51.655	48.284	48.229	48.453	28.670	28.968	33.084	24.808	35.597
KIMBERLY-CLARK CORP	KMB	160.192	160.951	160.759	80.039	79.917	75.159	77.556	71.536	39.824	46.196
KING WORLD PRODUCTIONS INC	KWP	36.761	37.298	38.183	38.064	37.826	38.121	23.726	27.149	23.727	25.392
KNIGHT-RIDDER INC	KRI	52.893	54.847	54.966	53.571	49.462	31.981	29.755	24.904	25.063	18.207
KROGER CO	KR	110.997	107.647	91.452	87.667	85.577	83.284	102.018	67.656	65.234	39.022
LILLY (ELI) & CO	LLY	291.936	292.748	292.686	292.623	267.138	174.390	157.736	135.114	177.906	163.081
LIMITED INC	LTD	357.604	357.801	362.648	361.786	360.598	259.432	311.257	315.905	295.558	220.700
LINCOLN NATIONAL CORP	LNC	94.478	94.183	42.071	41.587	41.496	46.131	50.575	19.404	14.821	13.586
LITTON INDUSTRIES INC	LIT	45.914	45.520	40.455	19.829	22.380	34.754	43.263	23.864	14.023	16.071
LIZ CLAIBORNE INC	LIZ	77.004	78.847	82.782	85.232	84.950	86.704	111.684	85.675	111.743	154.789
LOCKHEED MARTIN CORP	LMT	122.147	62.696	61.100	62.763	63.198	34.255	27.188	29.503	66.292	30.201
LONGS DRUG STORES INC	LDG	20.560	20.654	20.413	20.441	20.170	7.049	5.279	6.883	7.616	4.431
LORAL CORP	LOR	84.977	83.337	41.266	31.889	25.941	55.478	64.730	30.467	32.873	22.705
LOTUS DEVELOPMENT CORP	LOTS	47.849	44.928	41.881	42.225	42.218	433.173	293.005	227.992	226.605	157.713
LOUISIANA LAND & EXPLORATION	LLX	33.380	33.173	28.348	28.287	28.203	28.651	18.397	16.237	16.427	14.965
LOUISIANA-PACIFIC CORP	LPX	111.992	110.181	54.609	35.992	35.870	103.435	133.707	61.765	31.496	27.472
LOWES COS	LOW	159.527	73.944	72.973	36.440	36.460	154.723	72.114	86.845	28.281	45.303
LUBYS CAFETERIAS INC	LUB	25.118	27.227	27.134	27.398	27.374	10.970	13.851	13.501	13.865	11.190
M/A-COM INC	MAI	25.889	25.160	23.972	24.363	24.477	16.639	23.229	13.891	12.263	13.941

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COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
MALLINCKRODT GROUP INC	MKG	77.006	76.445	75.745	25.071	22.690	69.593	72.987	80.567	20.898	19.516
MANOR CARE INC	MNR	62.524	62.450	57.490	57.372	38.114	31.587	47.389	30.110	31.558	13.887
MARRIOTT INTL INC	MAR	122.500	125.700				60.550	23.410			
MARSH & MCLENNAN COS	MMC	73.200	73.932	73.275	71.841	73.521	28.507	30.170	25.127	28.737	30.434
MARTIN MARIETTA CORP	ML		95.697	47.229	49.530	48.866	50.919	51.713	31.635	38.603	29.593
MASCO CORP	MAS	156.990	152.850	152.470	151.010	147.760	117.752	101.404	92.396	79.018	72.309
MATTEL INC	MAT	176.720	135.895	96.120	63.316	49.079	113.694	155.958	100.476	76.040	56.450
MAXUS ENERGY CORP	MXS	135.399	134.200	133.432	102.656	100.127	102.230	183.797	158.546	112.361	79.065
MAY DEPARTMENT STORES CO	MA	248.383	248.342	124.053	123.458	122.896	135.494	131.434	63.386	55.258	61.757
MAYTAG CORP	MYG	107.337	106.720	106.605	106.343	105.726	111.495	65.035	87.311	70.342	66.342
MBNA CORP	KRB	148.500	99.000	49.500	49.517		113.244	78.882	37.985	60.809	
MCCAW CELLULAR COMM -CL A	MCAWA		208.553	186.126	182.279	179.201		281.714	178.137	140.730	171.800
MCDERMOTT INTL INC	MDR	53.960	53.444	52.212	51.355	44.069	44.110	48.147	46.924	59.197	59.593
MCDONALDS CORP	MCD	693.700	353.700	363.600	358.700	359.100	390.537	170.185	195.416	242.320	219.451
MCDONNELL DOUGLAS CORP	MD	38.912	39.328	39.190	38.391	38.320	37.357	54.121	49.054	52.809	39.763
MCGRAW-HILL COMPANIES	MHP	49.672	49.413	49.134	49.045	48.927	29.232	27.569	21.942	23.904	43.392
MCI COMMUNICATIONS	MCIC	680.000	541.000	263.000	259.000	254.000	773.084	783.086	299.995	363.781	572.181
MCKESSON CORP	MCK	44.375	40.605	40.574	38.931	38.190	76.891	27.390	24.029	18.149	19.751
MEAD CORP	MEA	58.649	59.185	58.734	58.337	58.274	50.172	36.788	38.069	36.034	46.980
MEDTRONIC INC	MDT	115.509	58.129	57.820	59.431	29.766	87.900	72.920	44.691	43.660	25.304
MELLON BANK CORP	MEL	147.165	63.478	54.963	51.145	43.964	85.968	58.673	44.731	33.185	23.726
MELVILLE CORP	MES	105.642	105.346	104.733	104.212	102.936	52.061	55.188	40.409	45.265	53.244
MERCANTILE STORES CO INC	MST	36.844	36.887	36.844	36.844	36.844	36.451	11.680	11.292	10.563	10.205
MERCK & CO	MRK	1,247.826	1,253.935	1,144.695	386.510	386.991	676.416	791.366	581.033	163.500	200.714
MEREDITH CORP	MDP	13.721	14.833	15.741	16.676	18.021	6.207	7.932	5.510	6.877	7.028
MERRILL LYNCH & CO	MER	181.479	203.990	103.601	102.722	99.835	240.842	281.211	123.518	145.787	72.916
MILLIPORE CORP	MIL	23.133	28.003	27.974	27.956	27.849	26.595	24.171	22.632	18.131	16.283
MINNESOTA MINING & MFG CO	MMM	419.794	214.739	219.034	219.140	219.833	155.617	83.842	76.809	101.885	115.324
MOBIL CORP	MOB	395.987	398.168	398.816	398.301	401.079	164.666	176.780	152.951	160.441	173.110
MONSANTO CO	MTC	111.535	115.976	120.464	122.927	125.778	94.858	84.691	99.518	90.800	108.520
MOORE CORP LTD	MCL	99.570	99.524	99.469	97.744	95.814	28.999	22.280	20.650	13.048	16.598
MORGAN (J P) & CO	JPM	187.701	193.087	191.610	189.529	185.654	134.634	130.366	141.967	134.645	126.018
MORRISON KNUDSEN CORP	MRN	32.864	31.618	30.640	14.313	11.795	34.239	25.862	28.652	16.333	14.064
MORTON INTL INC	MII	49.200	48.800	48.519	48.384	48.101	39.668	35.557	28.723	33.420	31.283
MOTOROLA INC	MOT	588.000	278.600	134.850	132.200	131.700	584.932	349.897	116.533	126.392	170.098
NACCO INDUSTRIES -CL A	NC	8.952	8.941	8.935	8.882	8.878	3.504	3.011	3.474	3.481	4.184
NALCO CHEMICAL CO	NLC	67.900	68.904	70.021	69.828	34.646	38.923	37.653	34.692	40.865	19.031
NATIONAL EDUCATION CORP	NEC	29.578	29.404	29.968	29.821	29.719	17.486	19.442	18.579	22.249	20.656
NATIONAL SEMICONDUCTOR CORP	NSM	122.800	122.800	109.738	106.296	103.793	288.026	210.918	185.847	115.744	115.686

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COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
NATIONAL SERVICE INDS INC	NSI	49.240	49.561	49.538	49.539	49.541	15.746	16.459	16.290	17.739	10.705
NATIONSBANK CORP	NB	276.452	270.905	252.990	231.246	102.861	190.038	168.653	184.826	100.545	102.499
NAVISTAR INTERNATIONL	NAV	74.354	74.701	254.098	250.117	250.023	51.123	47.395	154.539	121.194	143.622
NBD BANCORP INC	NBD	155.748	160.715	160.386	76.469	72.950	50.751	39.800	46.905	25.148	17.985
NEW YORK TIMES CO -CL A	NYT.A	98.240	106.858	79.706	78.364	77.201	51.927	53.705	32.131	27.883	33.649
NEWELL COMPANIES	NWL	157.843	78.792	78.338	62.127	59.572	87.345	52.649	53.125	30.834	30.647
NEWMONT MINING CORP	NEM	86.080	68.741	68.149	67.790	67.688	106.462	118.761	36.667	32.655	40.289
NIAGARA MOHAWK POWER	NMK	144.311	142.427	137.160	136.100	136.100	118.924	85.612	69.919	79.354	60.671
NICOR INC	GAS	51.540	53.959	27.885	28.650	28.966	18.054	23.143	12.989	14.053	17.099
NIKE INC -CL B	NKE		73.200	75.852	75.510	75.296	69.470	93.432	68.551	108.452	225.550
NL INDUSTRIES	NL	51.052	50.890	50.890	51.201	64.135	20.675	9.767	9.664	11.097	11.953
NORAM ENERGY CORP	NAE	122.530	122.362	122.258	116.488	115.137	63.296	79.764	135.395	89.609	55.104
NORDSTROM INC	NOBE	82.244	82.059	81.975	81.844	81.738	151.008	128.214	114.892	121.925	131.447
NORFOLK SOUTHERN CORP	NSC	133.133	138.495	140.316	142.936	155.579	53.054	47.140	49.733	56.093	66.093
NORTHERN STATES POWER/MN	NSP	66.922	66.880	62.598	62.541	62.541	24.726	20.308	21.168	22.523	21.651
NORTHERN TELECOM LTD	NT	253.354	251.266	248.414	245.619	243.516	89.022	103.544	55.690	40.313	59.266
NORTHROP GRUMMAN CORP	NOC	49.242	48.913	47.398	47.090	46.938	32.933	26.573	17.482	34.020	35.427
NORWEST CORP	NOB	309.145	292.175	144.375	130.163	119.878	149.167	158.211	60.515	65.247	47.153
NOVELL INC	NOVL	364.355	308.051	300.635	143.986	70.411	836.352	835.676	690.961	376.848	268.008
NUCOR CORP	NUE	87.333	87.073	43.368	21.604	21.488	57.331	50.999	20.524	11.630	10.758
NYNEX CORP	NYN	423.597	414.885	206.824	203.724	200.096	153.105	141.789	62.521	62.370	82.370
OCCIDENTAL PETROLEUM CORP	OXY	316.853	305.603	303.728	300.063	296.360	199.531	196.151	166.132	203.207	179.433
OGDEN CORP	OG	48.777	43.499	43.190	42.994	42.878	22.999	27.878	30.471	26.440	29.079
OHIO EDISON CO	OEC	152.569	152.569	152.569	152.569	152.569	56.593	43.479	46.558	60.909	76.125
ONEOK INC	OKE	26.690	26.634	26.629	26.621	26.627	11.118	12.711	13.958	14.005	12.460
ORACLE CORP	ORCL	433.357	286.361	142.228	139.897	136.297	848.348	800.407	343.861	340.634	406.023
ORYX ENERGY CO	ORX	98.946	96.932	96.917	79.667	79.654	85.045	91.532	71.849	43.505	36.841
OSHKOSH B'GOSH INC -CL A	GOSHA	13.502	14.586	14.586	14.586	14.586	15.505	12.608	12.665	19.314	22.024
OUTBOARD MARINE CORP	OM	20.000	19.800	19.500	19.400	19.500	23.747	20.079	21.867	21.666	14.529
OWENS CORNING FIBRGLAS	OCF	44.200	43.200	42.500	41.652	40.581	60.961	40.654	59.246	56.532	23.579
PACCAR INC	PCAR	38.859	33.789	33.822	33.822	33.807	25.420	20.691	25.285	21.816	16.453
PACIFIC ENTERPRISES	PET	84.532	84.194	75.290	73.017	70.699	37.333	45.805	49.880	34.534	19.774
PACIFIC GAS & ELECTRIC	PCG	430.243	427.219	426.846	417.572	420.219	172.091	139.100	105.763	104.637	127.354
PACIFIC TELESIS GROUP	PAC	424.065	423.059	405.092	401.018	399.459	202.877	181.813	128.073	112.334	121.710
PACIFICORP	PPW	284.251	281.021	270.579	262.096	252.832	99.695	112.713	103.179	71.868	75.652
PALL CORP	PLL	115.319	116.063	86.708	58.420	38.648	68.780	56.730	44.354	36.763	19.656
PANHANDLE EASTERN CORP	PEL	149.100	120.000	108.300	108.200	90.800	74.062	66.706	71.434	73.215	106.535
PARKER-HANNIFIN CORP	PH	48.940	48.601	48.409	48.205	48.918	38.201	29.151	24.926	23.267	24.437
PECO ENERGY CO	PE	221.609	221.516	220.534	220.030	216.953	107.612	95.839	104.524	89.210	113.172

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COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
PENNEY (J C) CO	JCP	227.441	236.086	117.389	116.651	116.561	159.671	161.511	86.927	65.648	76.195
PENNZOIL CO	PZL	46.127	45.910	40.716	40.461	40.241	27.617	31.306	22.564	17.456	19.328
PEOPLES ENERGY CORP	PGL	34.868	34.823	34.774	32.762	32.701	9.762	9.599	10.636	8.813	9.008
PEP BOYS-MANNY MOE & JACK	PBY	59.269	60.112	60.669	55.774	55.606	48.960	49.082	69.537	64.741	45.176
PEPSICO INC	PEP	789.900	798.781	798.800	789.100	788.400	418.825	371.480	310.986	489.256	438.485
PERKIN-ELMER CORP	PKN	42.949	43.944	33.636	33.547	33.230	29.622	30.329	25.401	27.206	27.393
PET INC	PT.	100.751	104.621	107.527	106.903	0.000	88.795	80.783	65.182	63.031	
PFIZER INC	PFE	314.226	320.922	325.141	329.647	165.122	213.864	289.060	215.168	212.617	153.403
PHELPS DODGE CORP	PD	70.672	70.531	70.374	34.811	34.441	100.162	116.490	102.352	47.300	55.940
PHILIP MORRIS COS INC	MO	852.859	877.091	892.757	919.851	926.219	576.271	722.731	472.429	497.940	524.536
PHILLIPS PETROLEUM CO	P	261.639	261.481	260.231	259.781	258.720	140.775	153.844	130.380	121.571	144.274
PIONEER HI-BRED INTERNATIONL	PHYB	86.214	89.442	90.274	30.220	30.924	74.458	72.467	57.920	17.548	19.930
PITNEY BOWES INC	PBI	151.276	158.174	157.175	79.382	78.689	84.561	61.117	59.356	36.762	47.093
PITTSTON CO-SERVICES GROUP	PZS	41.595	41.429		37.317	37.278	30.980	24.241		36.484	27.928
PLACER DOME INC	PDG	238.449	238.102	237.116	236.736	236.395	230.325	250.054	98.076	101.383	129.015
PNC BANK CORP	PNC	233.249	234.705	232.573	107.412	95.549	113.164	83.432	85.253	47.823	39.683
POLAROID CORP	PRD	45.998	46.806	46.668	48.919	50.070	26.926	36.906	49.927	42.031	42.572
POTLATCH CORP	PCH	29.224	29.199	29.144	29.033	28.971	11.564	11.600	8.937	16.850	11.335
PPG INDUSTRIES INC	PPG	206.988	106.841	106.135	106.170	106.040	90.393	38.453	46.137	44.176	40.738
PRAXAIR INC	PX	137.863	134.450	131.060			115.059	102.891	71.937		
PREMARK INTERNATIONAL INC	PMI	63.898	31.907	31.807	31.127	30.722	53.077	26.910	35.518	23.350	19.805
PRICE/COSTCO INC	PCCW	217.795	217.074	216.020			303.343	60.449			
PROCTER & GAMBLE CO	PG	684.348	681.754	678.794	338.089	346.294	195.798	220.821	204.194	151.722	153.972
PROVIDIAN CORP	PVN	97.536	101.426	47.401	46.353	44.783	49.153	47.387	24.294	27.494	26.745
PSI RESOURCES INC	CIN2		57.040	55.308	54.731	54.441	28.696	70.495	43.335	44.549	32.028
PUBLIC SERVICE ENTRP	PEG	244.698	243.688	235.396	226.701	218.472	89.732	102.154	99.735	85.510	67.393
PULTE CORP	PHM	27.453	27.547	27.432	24.755	23.528	20.679	22.842	32.536	12.070	11.149
QUAKER OATS CO	OAT	66.804	69.456	73.403	76.329	75.587	89.456	50.732	54.254	41.347	46.629
RALSTON PURINA GROUP	RAL	100.031	101.763		110.500	55.673	44.887	20.536		41.522	30.071
RAYCHEM CORP	RYC	43.006	41.875	40.242	38.241	36.424	25.577	30.746	23.594	25.490	34.911
RAYTHEON CO	RTN	123.322	135.214	135.660	66.720	65.355	72.756	59.525	61.631	51.787	50.435
REEBOK INTERNATIONAL LTD	RBK	80.945	83.691	89.363	90.974	114.428	56.841	90.920	114.768	119.320	90.345
REYNOLDS METALS CO	RLM	62.169	60.489	59.760	59.607	59.494	54.916	59.120	55.513	51.174	67.957
RITE AID CORP	RAD	84.165	86.011	88.040	87.814	41.526	86.177	56.794	46.432	65.048	21.334
ROADWAY SERVICES INC	ROAD	39.419	39.369	39.733	39.192	38.605	48.355	46.125	49.792	36.051	24.621
ROCKWELL INTL CORP	ROK	218.600	221.000	220.300	228.200	238.900	79.833	78.127	72.227	66.703	77.536
ROHM & HAAS CO	ROH	67.692	67.645	67.564	64.156	63.981	30.996	26.487	26.477	18.692	16.425
ROLLINS ENVIRONMENTAL SVCS	REN	60.376	60.350	60.287	60.192	60.144	33.259	56.481	52.610	56.129	44.702
ROWAN COS INC	RDC	84.280	83.892	73.187	72.869	72.629	75.438	74.106	77.213	83.586	70.299

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S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
ROYAL DUTCH PET -NY REG	RD	536.074	536.074	536.074	536.074	536.074	140.705	343.461	184.217	154.178	135.321
RUBBERMAID INC	RBD	160.801	160.357	160.239	160.189	79.993	82.877	60.618	56.632	49.280	24.741
RUSSELL CORP	RML	39.689	40.405	40.810	40.569	40.407	15.737	17.161	16.716	16.040	14.464
RYAN'S FAMILY STK HOUSES INC	RYAN	53.434	53.415	53.337	52.861	52.637	50.834	78.069	97.197	88.526	64.658
RYDER SYSTEM INC	R	78.761	77.294	75.412	73.691	73.656	54.035	57.544	53.543	50.309	57.428
SAFECO CORP	SAFC	62.952	62.932	62.815	62.748	62.722	67.424	63.263	47.609	48.020	49.652
SAFETY-KLEEN CORP	SK	57.755	57.684	57.668	56.949	37.816	42.466	49.578	31.493	39.370	22.006
SALOMON INC	SB	105.848	110.561	109.801	113.158	109.935	84.377	72.005	80.241	166.593	83.016
SANTA FE ENERGY RESOURCES	SFR	90.000	89.800	89.500	64.100	63.800	31.371	39.450	44.231	29.064	16.660
SANTA FE PACIFIC CORP	SFX	188.301	185.611	181.827	179.812	172.970	204.658	141.383	130.881	104.908	72.580
SARA LEE CORP	SLE	480.765	485.378	239.862	232.684	230.339	242.918	197.696	80.388	94.519	134.233
SBC COMMUNICATIONS INC	SBC	609.082	600.234	299.873	300.158	299.869	185.578	161.593	88.551	91.590	93.292
SCECORP	SCE	447.799	447.799	223.868	219.953	218.474	249.349	188.408	66.582	68.790	70.052
SCHERING-PLOUGH	SGP	186.014	193.555	199.517	201.789	222.025	137.702	161.641	143.153	183.824	125.612
SCHLUMBERGER LTD	SLB	242.232	243.549	241.834	239.962	238.125	134.805	149.688	148.623	146.786	153.902
SCIENTIFIC-ATLANTA INC	SFA	37.747	37.196	23.097	22.704	22.452	60.714	66.557	32.760	23.235	24.860
SCOTT PAPER CO	SPP	75.595	74.030	73.910	73.743	73.638	107.799	56.068	49.624	49.001	49.727
SEAGRAM CO LTD	VO	372.537	372.489	373.690	94.870	93.743	101.167	92.222	71.487	22.610	29.510
SEARS ROEBUCK & CO	S	351.740	350.848	345.844	344.096	343.085	235.169	251.118	198.468	163.493	157.427
SERVICE CORP INTERNATIONAL	SRV	94.857	84.859	76.905	50.654	45.867	46.827	56.875	49.927	38.904	33.261
SHARED MEDICAL SYSTEMS CORP	SMED	22.943	22.753	22.566	22.454	22.419	39.264	30.858	29.035	40.232	23.343
SHAWMUT NATIONAL CORP	SNC	120.771	95.440	92.528	73.765	73.678	130.536	110.895	97.344	100.062	53.344
SHERWIN-WILLIAMS CO	SHW	84.826	88.506	88.381	87.643	43.369	43.427	37.434	39.529	47.160	23.109
SHONEY'S INC	SHN	41.185	40.725	38.845	39.975	38.251	44.831	46.886	44.966	26.583	21.190
SKYLINE CORP	SKY	11.121	11.157	11.217	11.217	11.217	6.407	8.423	7.833	5.576	5.934
SNAP-ON INC	SNA	42.878	42.569	42.415	42.211	41.277	25.342	19.894	20.885	20.790	17.767
SONAT INC	SNT	86.381	87.158	43.038	42.939	42.874	64.188	72.033	29.767	30.427	27.364
SOUTHERN CO	SO	656.528	321.331	316.458	315.654	315.654	207.207	86.962	94.143	112.058	117.998
SPRINGS INDUSTRIES -CL A	SMI	17.595	17.582	17.571	17.564	17.501	6.477	7.128	7.405	6.650	6.639
SPRINT CORP	FON	348.300	343.400	220.659	218.163	214.935	222.028	187.477	135.276	140.942	193.720
SPX CORP	SPW	14.015	13.923	13.903	13.837	13.825	6.492	6.075	8.541	8.032	7.648
ST JUDE MEDICAL INC	STJM	46.479	46.414	47.518	47.355	47.045	86.065	114.171	136.558	106.407	115.874
ST PAUL COS	SPC	84.202	42.357	42.059	42.521	42.234	50.571	22.356	22.815	41.315	52.506
STANLEY WORKS	SWK	44.449	44.696	45.439	45.241	41.176	13.124	14.254	17.332	15.521	12.160
STONE CONTAINER CORP	STO	90.396	71.175	70.993	69.466	60.025	166.082	132.972	102.338	96.041	42.896
STRIDE RITE CORP	SRR	49.518	50.280	50.908	25.740	25.429	41.788	52.537	68.517	25.369	31.822
SUN CO INC	SUN	106.938	106.683	106.413	106.098	106.188	60.574	49.084	35.049	30.730	29.524
SUN MICROSYSTEMS INC	SUNW	93.851	102.112	100.002	96.360	92.613	366.591	404.077	384.363	395.485	361.043
SUNTRUST BANKS INC	STI	115.679	122.468	124.858	127.825	126.783	29.859	33.570	28.964	36.576	35.064

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S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
SUPERVALU INC	SVU	70.174	72.059	71.655	71.864	75.225	50.337	38.838	36.080	38.992	33.095
SYNTEX CORP	SYN		221.000	225.700	225.100	112.100	230.075	212.703	274.991	210.711	109.853
SYSCO CORP	SYY	183.069	184.458	185.776	92.600	91.754	92.069	82.245	84.666	45.634	43.901
TANDEM COMPUTERS INC	TDM	115.537	112.966	110.451	107.499	105.038	143.897	126.694	102.018	112.682	149.568
TANDY CORP	TAN	58.257	63.956	63.189	78.395	79.132	70.966	73.050	69.362	50.061	56.984
TEKTRONIX INC	TEK	31.439	30.270	30.483	29.610	29.247	34.954	19.892	24.509	33.342	23.121
TELE-COMM -SER A TCI GRP	TCOMA	576.063	449.761	430.096	418.580	357.949	658.364	702.207	443.852	296.206	350.022
TELEDYNE INC	TDY	55.462	55.439	55.413	55.413	55.413	29.631	28.684	27.685	26.316	19.446
TEMPLE-INLAND INC	TIN	56.019	55.481	55.251	54.914	54.589	35.949	35.228	32.356	30.600	25.446
TENET HEALTHCARE CORP	THC	199.938	166.081	165.899	166.963	87.382	210.109	225.976	167.676	183.190	74.595
TENNECO INC	TEN	187.717	169.786	144.976	123.841	121.985	134.749	118.732	87.995	125.739	91.422
TEXACO INC	TX	259.532	259.020	258.748	258.493	258.161	141.831	166.989	159.101	146.525	188.600
TEXAS INSTRUMENTS INC	TXN	92.683	90.817	82.599	82.134	81.778	199.669	178.725	99.875	100.807	98.588
TEXAS UTILITIES CO	TXU	225.841	224.345	217.316	210.700	196.970	130.032	132.008	149.963	136.147	206.634
TEXTRON INC	TXT	85.497	88.413	87.563	86.088	84.777	39.521	40.952	35.099	39.703	36.163
THOMAS & BETTS CORP	TNB	19.605	18.873	18.763	17.081	17.002	10.012	9.011	8.389	7.942	6.829
TIME WARNER INC	TWX	379.300	378.300	372.000	92.600	57.500	253.493	269.942	285.155	90.182	51.978
TIMES MIRROR COMPANY -SER A	TMC	128.618	128.609	128.573	128.519	128.484	56.763	44.057	30.378	31.993	37.190
TIMKEN CO	TKR	31.061	30.626	30.518	29.894	29.346	15.147	13.706	11.320	13.372	13.557
TJX COMPANIES INC	TJX	72.401	73.431	73.222	69.803	69.723	100.036	83.576	64.388	56.892	45.095
TORCHMARK CORP	TMK	71.534	72.895	73.512	50.763	51.315	33.679	28.701	28.065	15.716	17.620
TOYS R US INC	TOY	279.790	289.522	293.068	289.297	287.657	193.047	175.253	190.106	204.095	221.237
TRANSAMERICA CORP	TA	69.395	76.399	79.171	77.203	76.352	26.232	29.602	25.636	34.147	26.601
TRANSCO ENERGY CO	E	40.917	41.372	40.297	30.701	30.584	27.001	26.432	44.176	36.564	19.343
TRAVELERS GROUP INC	TRV	316.511	327.132	110.979	108.626	108.274	198.425	200.341	65.108	77.154	83.862
TRIBUNE CO	TRB	66.701	66.981	65.479	64.532	64.158	41.806	30.631	23.323	25.601	29.205
TRINOVA CORP	TNV	28.796	28.406	28.238	28.226	28.219	19.153	17.670	18.610	20.200	20.651
TRW INC	TRW	64.500	63.800	62.800	61.200	59.800	30.622	38.309	29.122	23.741	26.481
TYCO INTL INC	TYC	46.351	46.322	47.005	47.053		41.446	22.749	24.508	40.120	30.512
U S BANCORP	USBC	98.138	99.476	99.068	98.194	60.332	97.929	66.224	69.966	123.638	69.540
U S SURGICAL CORP	USS	56.836	56.258	55.628	52.387	24.363	182.753	181.676	146.366	80.234	29.709
U S WEST INC	USW	469.343	441.140	414.462	409.936	393.493	193.206	165.130	108.728	117.640	115.005
UAL CORP	UAL	12.439	24.569	24.238	23.758	21.885	34.216	58.460	52.584	48.524	74.872
UNILEVER N V -NY SHARES	UN	160.041	160.041	160.041	160.041	160.041	31.716	86.988	59.512	58.399	44.212
UNION CAMP CORP	UCC	70.012	69.833	69.664	69.461	67.420	38.004	41.028	49.031	46.334	38.755
UNION CARBIDE CORP	UK	144.412	150.547	132.865	127.607	125.674	182.251	173.201	192.809	106.160	151.873
UNION ELECTRIC CO	UEP	102.124	102.124	102.124	102.124	102.124	40.300	33.501	40.109	44.854	33.380
UNION PACIFIC CORP	UNP	205.937	205.161	203.895	202.844	100.129	108.221	79.882	79.335	94.176	50.559
UNISYS CORP	UIS	170.962	170.365	161.931	161.691	161.770	259.708	244.112	346.106	198.958	197.588

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
UNITED TECHNOLOGIES CORP	UTX	123.136	126.047	123.775	121.898	121.156	87.509	80.203	88.181	93.075	78.795
UNOCAL CORP	UCL	244.199	241.324	240.671	234.605	234.507	137.746	182.795	183.134	159.371	151.696
UPJOHN CO	UPJ	173.142	173.432	174.581	175.215	176.408	130.747	125.694	171.354	222.394	185.212
USAIR GROUP	U	61.088	59.216	47.217	46.646	45.528	130.692	148.809	88.730	85.212	59.028
USF&G CORP	FG	95.616	85.009	84.513	84.273	83.958	73.667	83.364	96.088	101.678	81.239
USLIFE CORP	USH	22.817	22.658	22.502	15.017	15.358	9.533	11.619	12.719	8.167	9.249
UST INC	UST	196.110	204.757	211.037	105.490	106.491	101.149	135.273	79.723	41.566	43.851
USX-MARATHON GROUP	MRO	287.186	286.582	286.563	258.218	269.555	134.442	129.946	209.561	159.878	
USX-U S STEEL GROUP	X	75.970	70.329	59.743	51.022	53.911	105.550	100.813	56.013	53.750	
VARITY CORP	VAT	41.661	43.957	30.999	24.988	249.301	49.468	62.948	26.807	16.191	161.969
VF CORP	VFC	64.165	64.489	59.519	57.700	57.013	34.091	64.646	35.141	30.057	31.198
WACHOVIA CORP	WB	170.934	171.376	85.736	85.323	69.679	54.043	62.819	16.540	22.229	17.324
WAL-MART STORES	WMT	2,297.000	2,298.769	1,149.819	1,149.028	1,142.282	661.258	833.476	290.720	334.669	390.085
WALGREEN CO	WAG	123.071	123.071	123.071	123.071	61.524	66.078	52.158	47.401	60.189	29.668
WARNER-LAMBERT CO	WLA	134.596	134.140	135.340	134.594	134.341	100.991	113.763	103.158	119.958	90.416
WELLS FARGO & CO	WFC	51.252	55.813	55.191	52.002	51.438	45.971	68.225	88.329	88.736	76.249
WENDY'S INTERNATIONAL INC	WEN	101.758	100.794	98.826	97.381	96.821	80.764	95.364	103.895	128.563	85.280
WESTINGHOUSE ELECTRIC CORP	WX	356.792	352.176	346.442	339.236	290.108	266.850	275.603	279.074	310.307	176.868
WESTVACO CORP	W	67.167	66.886	66.401	65.819	65.291	30.172	21.300	18.190	21.362	18.098
WEYERHAEUSER CO	WY	205.618	205.089	204.277	202.259	201.134	134.294	170.180	126.391	114.048	85.867
WHIRLPOOL CORP	WHR	73.845	73.068	70.027	69.640	69.465	66.983	62.942	50.217	47.973	37.798
WHITMAN CORP	WH	105.032	107.091	107.109	106.837	102.973	39.836	42.714	40.515	66.316	65.453
WILLIAMS COS INC	WMB	90.885	103.079	46.144	41.754	41.361	131.326	102.495	48.350	29.277	36.307
WINN-DIXIE STORES INC	WIN	74.176	74.956	76.851	77.129	39.157	12.543	16.494	13.140	10.822	7.007
WMX TECHNOLOGIES INC	WMX	496.387	483.453	490.177	493.621	488.665	324.135	344.282	264.278	290.907	271.928
WOOLWORTH CORP	Z	132.505	131.923	131.303	130.342	129.665	158.936	120.327	95.388	105.647	99.884
WORTHINGTON INDUSTRIES	WTHG	90.840	90.561	60.076	59.539	39.423	44.620	54.064	31.713	41.304	19.128
WRIGLEY (WM) JR CO	WWY	116.209	116.400	116.834	39.139	39.169	32.353	28.934	25.154	6.930	6.031
XEROX CORP	XRX	105.993	104.122	95.066	92.846	92.231	84.479	87.040	62.761	79.545	70.084
YELLOW CORP	YELL	28.106	28.100	28.102	28.086	28.089	54.999	41.895	30.801	37.299	31.757
ZENITH ELECTRONICS CORP	ZE	45.677	35.889	30.263	29.145	27.716	91.406	36.028	32.196	20.208	25.465
ZURN INDUSTRIES INC	ZRN	12.340	12.404	12.431	12.564	12.400	7.907	9.333	8.252	9.880	10.201
TOTAL		82,254.663	77,227.860	69,737.047	61,533.020	58,015.329	58,370.066	55,057.988	44,304.306	40,206.406	37,122.024

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S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
SUMMARY STATISTICS											
COUNT		490	500	497	496	494	495	500	495	496	492
SUM		82,254.663	77,227.860	69,737.047	61,533.020	58,015.329	58,370.066	55,057.988	44,304.306	40,206.406	37,122.024
MINIMUM		8.952	8.941	8.163	7.678	0.000	3.504	3.011	3.474	1.520	1.929
MAXIMUM		2,297.000	2,298.769	1,339.831	1,309.352	1,245.392	1,184.140	1,462.450	690.961	550.299	572.181
AVERAGE		167.867	154.456	140.316	124.059	117.440	117.919	110.116	89.504	81.061	75.451
MEDIAN		97.135	92.516	84.513	75.195	69.634	72.756	65.233	57.888	50.388	46.529
STD		222.591	200.006	175.512	154.266	148.919	148.301	141.546	98.538	88.223	83.801

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COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
ABBOTT LABORATORIES	ABT	0.353	0.399	0.373	0.357	0.416
ADVANCED MICRO DEVICES	AMD	2.764	3.281	3.449	3.127	1.356
AETNA LIFE & CASUALTY CO	AET	0.681	0.561	0.570	0.739	0.623
AHMANSON (H F) & CO	AHM	0.612	0.612	0.624	0.618	0.640
AIR PRODUCTS & CHEMICALS INC	APD	0.513	0.573	0.504	0.555	0.717
ALBERTO-CULVER CO -CL B	ACV	0.159	0.149	0.154	0.207	0.134
ALBERTSONS INC	ABS	0.365	0.528	0.398	0.485	0.340
ALCAN ALUMINIUM LTD	AL	0.546	0.417	0.322	0.459	0.658
ALCO STANDARD CORP	ASN	0.579	0.685	0.467	0.431	0.300
ALEXANDER & ALEXANDER	AAL	0.653	0.427	0.471	0.488	0.450
ALLERGAN INC	AGN	0.486	0.399	0.440	0.595	0.709
ALLIEDSIGNAL INC	ALD	0.485	0.570	0.670	0.646	0.475
ALUMINUM CO OF AMERICA	AA	1.231	0.934	0.976	0.840	1.298
ALZA CORP	AZA	1.089	1.520	0.942	0.933	0.957
AMDAHL CORP	AMH	0.689	0.729	0.909	0.654	0.705
AMERADA HESS CORP	AHC	0.636	0.621	0.784	0.634	0.754
AMERICAN BRANDS INC/DE	AMB	0.426	0.582	0.357	0.455	0.536
AMERICAN CYANAMID CO	ACY		0.754	0.687	0.823	0.928
AMERICAN ELECTRIC POWER	AEP	0.482	0.370	0.354	0.381	0.386
AMERICAN EXPRESS	AXP	0.799	0.764	0.677	0.890	0.679
AMERICAN GENERAL CORP	AGC	0.434	0.426	0.364	0.458	1.174
AMERICAN GREETINGS -CL A	AGREA	1.334	1.370	1.376	1.435	1.413
AMERICAN HOME PRODUCTS CORP	AHP	0.382	0.431	0.432	0.397	0.346
AMERICAN INTERNATIONAL GROUP	AIG	0.391	0.413	0.428	0.390	0.460
AMERICAN STORES CO	ASC	0.566	0.510	0.468	0.632	0.583
AMERITECH CORP	AIT	0.242	0.318	0.209	0.220	0.236
AMGEN INC	AMGN	2.647	3.725	2.417	3.830	4.219
AMOCO CORP	AN	0.359	0.341	0.323	0.281	0.343
AMP INC	AMP	0.560	0.508	0.527	0.461	0.595
AMR CORP/DE	AMR	1.570	2.072	2.138	1.878	2.038
ANDREW CORP	ANDW	1.822	2.058	1.594	1.003	0.991
ANHEUSER-BUSCH COS INC	BUD	0.412	0.508	0.392	0.358	0.387
APPLE COMPUTER INC	AAPL	4.269	4.342	3.105	4.337	3.435
ARCHER-DANIELS-MIDLAND CO	ADM	0.473	0.489	0.535	0.607	0.582
ARMCO INC	AS	0.584	0.777	0.526	0.558	0.614
ARMSTRONG WORLD INDS INC	ACK	1.184	0.859	0.798	0.785	0.894
ASARCO INC	AR	1.227	0.903	0.880	0.601	0.598
ASHLAND INC	ASH	0.898	0.673	0.523	0.448	0.533
AT&T CORP	T	0.328	0.348	0.320	0.349	0.381

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
ATLANTIC RICHFIELD CO	ARC	0.568	0.518	0.413	0.498	0.492
AUTODESK INC	ACAD	4.347	5.529	4.392	4.703	2.868
AUTOMATIC DATA PROCESSING	AUD	0.420	0.441	0.386	0.425	0.610
AVERY DENNISON CORP	AVY	0.546	0.413	0.459	0.478	0.633
AVON PRODUCTS	AVP	0.890	0.980	0.784	1.441	1.176
BAKER-HUGHES INC	BHI	1.126	1.128	1.153	1.027	0.957
BALL CORP	BLL	0.678	0.756	0.621	0.553	0.302
BALLY ENTMT CORP	BLY	1.045	2.064	1.375	1.298	2.268
BALTIMORE GAS & ELECTRIC	BGE	0.442	0.345	0.342	0.377	0.480
BANC ONE CORP	ONE	0.613	0.521	0.483	0.414	0.398
BANK OF BOSTON CORP	BKB	0.962	1.233	1.618	1.711	1.516
BANKAMERICA CORP	BAC	0.734	0.863	0.737	1.191	0.997
BANKERS TRUST NEW YORK CORP	BT	1.019	0.693	0.612	0.806	0.734
BARD (C.R.) INC	BCR	0.764	1.079	0.770	1.167	1.256
BARNETT BANKS INC	BBI	0.692	0.725	0.635	0.879	0.860
BARRICK GOLD CORPORATION	ABX	0.904	1.144	0.564	0.436	0.573
BASSETT FURNITURE INDS	BSET	0.556	0.622	0.597	0.198	0.250
BAUSCH & LOMB INC	BOL	1.312	0.784	0.609	0.649	0.767
BAXTER INTERNATIONAL INC	BAX	0.573	0.842	0.548	0.554	0.718
BECTON DICKINSON & CO	BDX	0.633	0.559	0.621	1.030	0.695
BELL ATLANTIC CORP	BEL	0.289	0.312	0.311	0.260	0.264
BELLSOUTH CORP	BLS	0.271	0.207	0.215	0.183	0.208
BEMIS CO	BMS	0.277	0.279	0.275	0.333	0.238
BENEFICIAL CORP	BNL	0.410	0.546	0.530	0.561	0.641
BETHLEHEM STEEL CORP	BS	1.482	1.759	0.917	1.006	0.770
BEVERLY ENTERPRISES	BEV	1.261	1.570	1.291	1.474	1.522
BIOMET INC	BMET	0.900	1.289	1.540	1.460	1.754
BLACK & DECKER CORP	BDK	1.001	0.874	1.372	1.371	1.272
BLOCK H & R INC	HRB	0.774	0.565	0.527	0.458	0.473
BLOCKBUSTER ENMNT CORP	BV		0.944	1.197	1.924	1.188
BOATMENS BANCSHARES INC	BOAT	0.775	0.837	0.724	0.778	0.712
BOEING CO	BA	0.610	0.706	0.860	0.937	0.925
BOISE CASCADE CORP	BCC	1.148	0.966	0.705	0.840	1.007
BORDEN INC	BN	1.156	1.180	0.598	0.543	0.458
BRIGGS & STRATTON	BGG	0.961	0.816	0.715	0.731	0.602
BRISTOL MYERS SQUIBB	BMY	0.465	0.736	0.645	0.497	0.486
BROWN GROUP INC	BG	0.391	0.425	0.438	0.444	0.488
BROWN-FORMAN -CL B	BF.B	0.190	0.241	0.188	0.161	0.185
BROWNING-FERRIS INDS	BFI	0.747	0.658	0.676	0.903	0.926

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
BRUNOS INC	3BRNO	0.812	0.961	0.769	0.958	0.399
BRUNSWICK CORP	BC	0.895	0.544	0.700	0.853	0.460
BURLINGTON NORTHRN INC	BNI	1.022	0.924	0.979	1.031	0.859
BURLINGTON RESOURCES INC	BR	0.638	0.742	0.619	0.663	0.652
CAMPBELL SOUP CO	CPB	0.227	0.221	0.271	0.320	0.383
CAPITAL CITIES/ABC INC	CCB	0.484	0.457	0.368	0.455	0.465
CAROLINA POWER & LIGHT	CPL	0.344	0.382	0.404	0.307	0.441
CATERPILLAR INC	CAT	1.151	0.932	0.794	0.750	0.933
CBS INC	CBS	1.308	1.027	1.184	0.978	0.624
CENTEX CORP	CTX	1.790	1.129	1.275	0.823	0.890
CENTRAL & SOUTH WEST CORP	CSR	0.455	0.357	0.374	0.353	0.519
CERIDIAN CORP	CEN	1.063	0.669	0.865	0.625	0.809
CHAMPION INTERNATIONAL CORP	CHA	0.725	0.471	0.535	0.724	0.795
CHARMING SHOPPES	CHRS	1.235	2.496	2.280	2.201	1.094
CHASE MANHATTAN CORP	CMB	1.107	1.303	1.325	1.402	1.858
CHEMICAL BANKING CORP	CHL	0.987	1.037	1.165	0.717	1.339
CHEVRON CORP	CHV	0.422	0.456	0.352	0.299	0.386
CHRYSLER CORP	C	1.609	1.593	1.446	0.665	0.725
CHUBB CORP	CB	0.661	0.651	0.716	0.640	0.869
CIGNA CORP	CI	0.741	0.570	0.528	0.567	0.651
CINCINNATI MILACRON INC	CMZ	0.623	0.980	0.575	0.597	0.394
CIRCUIT CITY STORES INC	CC	1.414	1.482	1.322	1.436	1.319
CISCO SYSTEMS INC	CSCO	4.313	4.907	4.593	6.332	3.078
CITICORP	CCI	1.160	1.385	1.237	1.183	1.229
CLARK EQUIPMENT CO	CKL	1.255	1.225	0.811	0.802	0.803
CLOROX CO/DE	CLX	0.413	0.481	0.514	0.471	0.450
CNA FINANCIAL CORP	CNA	0.207	0.077	0.076	0.086	0.124
COASTAL CORP	CGP	0.634	0.635	0.755	0.764	0.501
COCA-COLA CO	KO	0.314	0.278	0.321	0.310	0.390
COLGATE-PALMOLIVE CO	CL	0.725	0.875	0.507	0.615	0.753
COLUMBIA GAS SYSTEM	CG	0.601	0.680	0.707	1.637	0.629
COLUMBIA/HCA HLTHCR -VTG	COL	0.758	0.264	0.807	0.863	0.130
COMCAST CORP -CL A SPL	CMCSK	1.372	0.937	0.551	0.392	0.500
COMMONWEALTH EDISON CO	UCM1	0.311	0.474	0.727	0.518	0.517
COMMUNITY PSYCHIATRIC CNTRS	CMY	1.578	1.087	1.227	2.217	1.200
COMPAQ COMPUTER CORP	CPQ	3.005	3.227	2.981	3.238	3.139
COMPUTER ASSOCIATES INTL INC	CA	1.144	0.849	0.968	0.907	0.906
COMPUTER SCIENCES CORP	CSC	0.738	0.749	0.892	1.186	0.964
CONAGRA INC	CAG	0.423	0.394	0.488	0.458	0.368

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
CONRAIL INC	CRR	1.032	1.005	1.259	1.349	1.436
CONSOLIDATED EDISON OF NY	ED	0.428	0.296	0.341	0.432	0.365
CONSOLIDATED FREIGHTWAYS INC	CNF	1.378	0.960	0.770	1.250	1.503
CONSOLIDATED NATURAL GAS CO	CNG	0.436	0.323	0.387	0.261	0.253
CONTINENTAL CORP	CIC		0.713	0.770	0.606	0.755
COOPER INDUSTRIES INC	CBE	0.748	0.496	0.593	0.429	0.492
COOPER TIRE & RUBBER	CTB	0.615	1.138	0.575	0.590	0.830
COORS (ADOLPH) -CL B	ACCOB	0.630	0.772	0.686	0.929	1.106
CORESTATES FINANCIAL CORP	CFL	0.475	1.116	1.192	1.326	1.338
CORNING INC	GLW	0.476	0.650	0.614	0.430	0.464
CPC INTERNATIONAL INC	CPC	0.505	0.451	0.467	0.595	0.475
CRANE CO	CR	0.418	0.418	0.362	0.520	0.339
CRAY RESEARCH	CYR	1.503	1.077	1.295	1.130	1.501
CROWN CORK & SEAL CO INC	CCK	0.568	0.525	0.438	0.450	0.503
CSX CORP	CSX	0.565	0.596	0.574	0.585	0.427
CUMMINS ENGINE	CUM	1.010	1.379	1.198	0.903	0.646
CYPRUS AMAX MINERALS CO	CYM	1.068	0.809	1.063	0.771	0.717
DANA CORP	DCN	0.672	0.599	0.699	0.374	0.357
DATA GENERAL CORP	DGN	1.083	0.957	1.673	2.646	0.880
DAYTON HUDSON CORP	DH	1.065	0.944	1.050	0.961	0.902
DEAN WITTER DISCOVER & CO	DWD	0.686	0.764			
DEERE & CO	DE	1.493	1.204	0.941	1.044	1.389
DELTA AIR LINES INC	DAL	1.301	1.691	1.621	1.457	1.366
DELUXE CORP	DLX	0.537	0.507	0.320	0.384	0.296
DETROIT EDISON CO	DTE	0.596	0.452	0.394	0.371	0.504
DIAL CORP/DE	DL	0.756	0.579	0.611	0.586	0.696
DIGITAL EQUIPMENT	DEC	1.983	1.215	1.351	1.330	1.294
DILLARD DEPT STORES -CL A	DDS	1.023	0.974	0.940	0.859	0.523
DISNEY (WALT) COMPANY	DIS	0.577	0.669	0.856	0.883	1.064
DOMINION RESOURCES INC	D	0.383	0.277	0.292	0.370	0.486
DONNELLEY (R R) & SONS CO	DNY	0.349	0.335	0.292	0.353	0.346
DOVER CORP	DOV	0.394	0.304	0.298	0.411	0.431
DOW CHEMICAL	DOW	0.664	0.510	0.463	0.545	0.693
DOW JONES & CO INC	DJ	0.491	0.366	0.338	0.215	0.241
DRESSER INDUSTRIES INC	DI	0.763	0.939	0.795	0.874	0.899
DSC COMMUNICATIONS CORP	DIGI	5.235	6.031	3.578	2.793	3.268
DU PONT (E I) DE NEMOURS	DD	0.393	0.319	0.312	0.318	0.319
DUKE POWER CO	DUK	0.366	0.246	0.280	0.322	0.428
DUN & BRADSTREET CORP	DNB	0.373	0.408	0.318	0.375	0.510

APPENDIX I
Exhibit 3

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
E-SYSTEMS INC	ESY	0.769	0.766	0.612	0.864	0.650
EASTERN ENTERPRISES	EFU	0.528	0.640	0.611	0.516	0.535
EASTMAN KODAK CO	EK	0.799	1.180	0.676	0.701	0.767
EATON CORP	ETN	0.634	0.524	0.628	0.515	0.470
ECHLIN INC	ECH	0.885	0.726	0.892	0.602	0.507
ECHO BAY MINES LTD	ECO	1.478	2.397	0.688	0.748	0.896
ECOLAB INC	ECL	0.268	0.249	0.382	0.422	0.639
EG&G INC	EGG	0.525	0.534	0.500	0.470	0.530
EMERSON ELECTRIC CO	EMR	0.372	0.359	0.320	0.338	0.398
ENGELHARD CORP	EC	0.628	0.442	0.410	0.460	0.353
ENRON CORP	ENE	0.495	0.517	0.530	0.497	0.406
ENSERCH CORP	ENS	0.657	0.636	0.593	0.628	0.491
ENTERGY CORP	ETR	0.754	0.369	0.546	0.521	0.552
ETHYL CORP	EY	0.646	0.457	0.422	0.375	0.372
EXXON CORP	XON	0.244	0.222	0.210	0.224	0.237
FED HOME LOAN MTG CO	FRE	0.572	0.603	0.726	0.921	1.329
FEDDERS CORP	FJC	1.169	1.053	1.110	1.441	1.374
FEDERAL EXPRESS CORP	FDX	1.057	0.913	1.057	0.754	1.031
FEDERAL NATL MORTGAGE ASSN	FNM	0.748	0.691	0.731	0.962	1.358
FEDERAL PAPER BOARD CO	FBO	0.979	0.837	0.999	1.244	0.717
FIRST CHICAGO CORP	FNB	0.966	0.921	1.028	0.861	1.071
FIRST FID BANCORPORATION	FFB	0.479	0.573	0.454	0.431	0.725
FIRST INTERSTATE BNCP	I	1.220	1.160	1.301	1.203	1.444
FIRST MISSISSIPPI CORP	FRM	1.053	0.619	0.747	0.448	0.588
FIRST UNION CORP (N C)	FTU	0.463	0.632	0.686	0.562	0.460
FLEET FINANCIAL GROUP INC	FLT	0.907	0.693	0.479	0.552	0.576
FLEETWOOD ENTERPRISES	FLE	0.806	1.085	1.245	0.893	0.635
FLEMING COMPANIES INC	FLM	0.879	0.745	0.894	0.872	0.803
FLUOR CORP	FLR	1.076	0.699	0.721	1.162	0.958
FMC CORP	FMC	0.459	0.488	0.467	0.407	0.398
FORD MOTOR CO	F	0.814	0.763	0.808	0.572	0.462
FOSTER WHEELER CORP	FWC	1.024	0.761	0.699	0.982	0.909
FOXMEYER HEALTH CORP	FOX	0.588	0.860	0.398	0.747	0.807
FPL GROUP INC	FPL	0.607	0.485	0.424	0.466	0.398
GANNETT CO	GCI	0.645	0.473	0.379	0.469	0.423
GAP INC	GPS	1.326	0.998	1.350	0.936	1.117
GENERAL DYNAMICS CORP	GD	0.698	0.698	1.366	1.002	0.537
GENERAL ELECTRIC CO	GE	0.336	0.306	0.317	0.417	0.454
GENERAL MILLS INC	GIS	0.609	0.478	0.418	0.373	0.524

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
GENERAL MOTORS CORP	GM	0.931	0.815	0.761	0.586	0.486
GENERAL RE CORP	GRN	0.651	0.547	0.628	0.538	0.551
GENERAL SIGNAL CORP	GSX	0.768	0.589	0.654	0.628	0.724
GENESCO INC	GCO	0.918	1.161	0.698	0.584	0.622
GENUINE PARTS CO	GPC	0.289	0.284	0.317	0.400	0.408
GEORGIA-PACIFIC CORP	GP	1.258	1.036	1.012	0.850	0.771
GERBER PRODUCTS CO	GEB		0.740	0.817	0.574	0.789
GIANT FOOD INC -CL A	GFS.A	0.316	0.279	0.350	0.366	0.274
GIDDINGS & LEWIS INC/WI	GIDL	1.972	2.053	2.767	1.829	1.800
GILLETTE CO	G	0.473	0.623	0.511	0.715	0.964
GOLDEN WEST FINANCIAL CORP	GDW	0.498	0.493	0.446	0.593	0.660
GOODRICH (B F) CO	GR	0.747	0.869	1.278	0.882	0.805
GOODYEAR TIRE & RUBBER CO	GT	1.048	0.949	1.333	1.394	1.136
GRACE (W R) & CO	GRA	0.440	0.616	0.861	0.797	0.651
GRAINGER (W W) INC	GWW	0.504	0.460	0.453	0.492	0.429
GREAT ATLANTIC & PAC TEA CO	GAP	0.266	0.373	0.626	0.414	0.392
GREAT LAKES CHEMICAL CORP	GLK	1.007	0.633	0.678	0.608	0.560
GREAT WESTERN FINANCIAL	GWF	0.716	0.974	0.695	0.736	0.821
GRUMMAN CORP	GQ		0.670	0.340	0.450	0.455
GTE CORP	GTE	0.370	0.308	0.306	0.336	0.363
HALLIBURTON CO	HAL	1.005	1.030	1.183	1.197	1.067
HANDLEMAN CO	HDL	0.588	0.789	0.647	0.986	0.707
HARCOURT GENERAL INC	H	0.500	0.497	0.556	0.403	0.333
HARLAND (JOHN H.) CO	JH	0.542	0.479	0.510	0.494	0.473
HARNISCHFEGER INDUSTRIES INC	HPH	1.035	0.840	0.808	0.795	1.284
HARRAHS ENTERTAINMENT INC	HET	1.789	1.732	0.924	1.043	1.052
HARRIS CORP	HRS	0.730	0.674	0.634	0.744	0.730
HARTMARX CORP	HMX	0.313	0.498	0.994	0.612	0.704
HASBRO INC	HAS	0.790	0.684	0.593	0.767	0.531
HEINZ (H J) CO	HNZ	0.467	0.399	0.444	0.452	0.287
HELMERICH & PAYNE	HP	0.513	0.642	0.493	0.724	0.704
HERCULES INC	HPC	0.878	0.784	0.769	0.802	0.579
HERSHEY FOODS CORP	HSY	0.363	0.335	0.270	0.302	0.344
HEWLETT-PACKARD CO	HWP	0.811	0.760	0.858	0.717	0.603
HILTON HOTELS CORP	HLT	0.998	0.831	0.632	0.939	1.770
HOME DEPOT INC	HD	0.636	0.848	0.842	0.927	1.174
HOMESTAKE MINING	HM	1.458	1.788	0.763	0.822	0.966
HONEYWELL INC	HON	0.643	0.701	0.605	0.764	1.311
HOUSEHOLD INTERNATIONAL INC	HI	0.672	0.605	0.633	0.912	1.115

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
HOUSTON INDUSTRIES INC	HOU	0.591	0.446	0.466	0.604	0.530
ILLINOIS TOOL WORKS	ITW	0.308	0.266	0.270	0.337	0.340
INCO LTD	N	0.891	0.541	0.440	0.467	0.600
INGERSOLL-RAND CO	IR	0.544	0.629	0.570	0.676	0.832
INLAND STEEL INDUSTRIES INC	IAD	1.167	0.823	0.699	0.730	0.784
INTEL CORP	INTC	2.867	3.499	2.607	2.699	2.360
INTERGRAPH CORP	INGR	0.892	0.921	1.416	2.401	1.719
INTERPUBLIC GROUP OF COS	IPG	0.404	0.670	0.442	0.455	0.484
INTL BUSINESS MACHINES CORP	IBM	1.026	0.997	0.894	0.769	0.705
INTL FLAVORS & FRAGRANCES	IFF	0.340	0.419	0.344	0.489	0.501
INTL PAPER CO	IP	1.046	0.851	0.942	0.985	0.888
ITT CORP	ITT	0.875	0.550	0.641	0.547	0.644
JAMES RIVER CORP OF VIRGINIA	JR	0.739	0.497	0.430	0.677	0.540
JEFFERSON-PILOT CORP	JP	0.349	0.326	0.404	0.410	0.362
JOHNSON & JOHNSON	JNJ	0.466	0.548	0.477	0.554	0.520
JOHNSON CONTROLS INC	JCI	0.567	0.462	0.498	0.495	0.501
JOSTENS INC	JOS	0.586	0.834	0.675	0.523	0.353
K MART CORP	KM	0.813	0.850	0.670	0.759	0.610
KAUFMAN & BROAD HOME	KBH	1.671	1.205	1.690	1.244	0.828
KELLOGG CO	K	0.317	0.352	0.256	0.296	0.320
KERR-MCGEE CORP	KMG	0.555	0.561	0.685	0.514	0.735
KIMBERLY-CLARK CORP	KMB	0.469	0.482	0.445	0.498	0.578
KING WORLD PRODUCTIONS INC	KWP	1.037	0.636	0.711	0.623	0.671
KNIGHT-RIDDER INC	KRI	0.605	0.543	0.453	0.468	0.368
KROGER CO	KR	0.750	0.948	0.740	0.744	0.456
LILLY (ELI) & CO	LLY	0.597	0.539	0.462	0.608	0.610
LIMITED INC	LTD	0.725	0.870	0.871	0.817	0.612
LINCOLN NATIONAL CORP	LNC	0.488	0.537	0.461	0.356	0.327
LITTON INDUSTRIES INC	LIT	0.757	0.950	0.590	0.707	0.718
LIZ CLAIBORNE INC	LIZ	1.126	1.416	1.035	1.311	1.822
LOCKHEED MARTIN CORP	LMT	0.280	0.434	0.483	1.056	0.478
LONGS DRUG STORES INC	LDG	0.343	0.256	0.337	0.373	0.220
LORAL CORP	LOR	0.653	0.777	0.738	1.031	0.875
LOTUS DEVELOPMENT CORP	LOTS	9.053	6.522	5.444	5.367	3.736
LOUISIANA LAND & EXPLORATION	LLX	0.858	0.555	0.573	0.581	0.531
LOUISIANA-PACIFIC CORP	LPX	0.924	1.214	1.131	0.875	0.766
LOWES COS	LOW	0.970	0.975	1.190	0.776	1.243
LUBYS CAFETERIAS INC	LUB	0.437	0.509	0.498	0.506	0.409
M/A-COM INC	MAI	0.643	0.923	0.579	0.503	0.570

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
MALLINCKRODT GROUP INC	MKG	0.904	0.955	1.064	0.834	0.860
MANOR CARE INC	MNR	0.505	0.759	0.524	0.550	0.364
MARRIOTT INTL INC	MAR	0.494	0.186			
MARSH & MCLENNAN COS	MMC	0.389	0.408	0.343	0.400	0.414
MARTIN MARIETTA CORP	ML		0.540	0.670	0.779	0.606
MASCO CORP	MAS	0.750	0.663	0.606	0.523	0.489
MATTEL INC	MAT	0.643	1.148	1.045	1.201	1.150
MAXUS ENERGY CORP	MXS	0.755	1.370	1.188	1.095	0.790
MAY DEPARTMENT STORES CO	MA	0.546	0.529	0.511	0.448	0.503
MAYTAG CORP	MYG	1.039	0.609	0.819	0.661	0.627
MBNA CORP	KRB	0.763	0.797	0.767	1.228	
MCCAW CELLULAR COMM -CL A	MCAWA		1.351	0.957	0.772	0.959
MCDERMOTT INTL INC	MDR	0.817	0.901	0.899	1.153	1.352
MCDONALDS CORP	MCD	0.563	0.481	0.537	0.676	0.611
MCDONNELL DOUGLAS CORP	MD	0.960	1.376	1.252	1.376	1.038
MCGRAW-HILL COMPANIES	MHP	0.589	0.558	0.447	0.487	0.887
MCI COMMUNICATIONS	MCIC	1.137	1.447	1.141	1.405	2.253
MCKESSON CORP	MCK	1.733	0.675	0.592	0.466	0.517
MEAD CORP	MEA	0.855	0.622	0.648	0.618	0.806
MEDTRONIC INC	MDT	0.761	1.254	0.773	0.735	0.850
MELLON BANK CORP	MEL	0.584	0.924	0.814	0.649	0.540
MELVILLE CORP	MES	0.493	0.524	0.386	0.434	0.517
MERCANTILE STORES CO INC	MST	0.989	0.317	0.306	0.287	0.277
MERCK & CO	MRK	0.542	0.631	0.508	0.423	0.519
MEREDITH CORP	MDP	0.452	0.535	0.350	0.412	0.390
MERRILL LYNCH & CO	MER	1.327	1.379	1.192	1.419	0.730
MILLIPORE CORP	MIL	1.150	0.863	0.809	0.649	0.585
MINNESOTA MINING & MFG CO	MMM	0.371	0.390	0.351	0.465	0.525
MOBIL CORP	MOB	0.416	0.444	0.384	0.403	0.432
MONSANTO CO	MTC	0.850	0.730	0.826	0.739	0.863
MOORE CORP LTD	MCL	0.291	0.224	0.208	0.133	0.173
MORGAN (J P) & CO	JPM	0.717	0.675	0.741	0.710	0.679
MORRISON KNUDSEN CORP	MRN	1.042	0.818	0.935	1.141	1.192
MORTON INTL INC	MII	0.806	0.729	0.592	0.691	0.650
MOTOROLA INC	MOT	0.995	1.256	0.864	0.956	1.292
NACCO INDUSTRIES -CL A	NC	0.391	0.337	0.389	0.392	0.471
NALCO CHEMICAL CO	NLC	0.573	0.546	0.495	0.585	0.549
NATIONAL EDUCATION CORP	NEC	0.591	0.661	0.620	0.746	0.695
NATIONAL SEMICONDUCTOR CORP	NSM	2.345	1.718	1.694	1.089	1.115

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
NATIONAL SERVICE INDS INC	NSI	0.320	0.332	0.329	0.358	0.216
NATIONSBANK CORP	NB	0.687	0.623	0.731	0.435	0.996
NAVISTAR INTERNATIONL	NAV	0.688	0.634	0.608	0.485	0.574
NBD BANCORP INC	NBD	0.326	0.248	0.292	0.329	0.247
NEW YORK TIMES CO -CL A	NYT.A	0.529	0.503	0.403	0.356	0.436
NEWELL COMPANIES	NWL	0.553	0.668	0.678	0.496	0.514
NEWMONT MINING CORP	NEM	1.237	1.728	0.538	0.482	0.595
NIAGARA MOHAWK POWER	NMK	0.824	0.601	0.510	0.583	0.446
NICOR INC	GAS	0.350	0.429	0.466	0.491	0.590
NIKE INC -CL B	NKE		1.276	0.904	1.436	2.996
NL INDUSTRIES	NL	0.405	0.192	0.190	0.217	0.186
NORAM ENERGY CORP	NAE	0.517	0.652	1.107	0.769	0.479
NORDSTROM INC	NOBE	1.836	1.562	1.402	1.490	1.608
NORFOLK SOUTHERN CORP	NSC	0.399	0.340	0.354	0.392	0.425
NORTHERN STATES POWER/MN	NSP	0.369	0.304	0.338	0.360	0.346
NORTHERN TELECOM LTD	NT	0.351	0.412	0.224	0.164	0.243
NORTHROP GRUMMAN CORP	NOC	0.669	0.543	0.369	0.722	0.755
NORWEST CORP	NOB	0.483	0.541	0.419	0.501	0.393
NOVELL INC	NOVL	2.295	2.713	2.298	2.617	3.806
NUCOR CORP	NUE	0.656	0.586	0.473	0.538	0.501
NYNEX CORP	NYN	0.361	0.342	0.302	0.306	0.412
OCCIDENTAL PETROLEUM CORP	OXY	0.630	0.642	0.547	0.677	0.605
OGDEN CORP	OG	0.472	0.641	0.706	0.615	0.678
OHIO EDISON CO	OEC	0.371	0.285	0.305	0.399	0.499
ONEOK INC	OKE	0.417	0.477	0.524	0.526	0.468
ORACLE CORP	ORCL	1.958	2.795	2.418	2.435	2.979
ORYX ENERGY CO	ORX	0.860	0.944	0.741	0.546	0.463
OSHKOSH B'GOSH INC -CL A	GOSHA	1.148	0.864	0.868	1.324	1.510
OUTBOARD MARINE CORP	OM	1.187	1.014	1.121	1.117	0.745
OWENS CORNING FIBRGLAS	OCF	1.379	0.941	1.394	1.357	0.581
PACCAR INC	PCAR	0.654	0.612	0.748	0.645	0.487
PACIFIC ENTERPRISES	PET	0.442	0.544	0.663	0.473	0.280
PACIFIC GAS & ELECTRIC	PCG	0.400	0.326	0.248	0.251	0.303
PACIFIC TELESIS GROUP	PAC	0.478	0.430	0.316	0.280	0.305
PACIFICORP	PPW	0.351	0.401	0.381	0.274	0.299
PALL CORP	PLL	0.596	0.489	0.512	0.629	0.509
PANHANDLE EASTERN CORP	PEL	0.497	0.556	0.660	0.677	1.173
PARKER-HANNIFIN CORP	PH	0.781	0.600	0.515	0.483	0.500
PECO ENERGY CO	PE	0.486	0.433	0.474	0.405	0.522

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
PENNEY (J C) CO	JCP	0.702	0.684	0.741	0.563	0.654
PENNZOIL CO	PZL	0.599	0.682	0.554	0.431	0.480
PEOPLES ENERGY CORP	PGL	0.280	0.276	0.306	0.269	0.275
PEP BOYS-MANNY MOE & JACK	PBY	0.826	0.817	1.146	1.161	0.812
PEPSICO INC	PEP	0.530	0.465	0.389	0.620	0.556
PERKIN-ELMER CORP	PKN	0.690	0.690	0.755	0.811	0.824
PET INC	PT.	0.881	0.772	0.606	0.590	
PFIZER INC	PFE	0.681	0.901	0.662	0.645	0.929
PHELPS DODGE CORP	PD	1.417	1.652	1.454	1.359	1.624
PHILIP MORRIS COS INC	MO	0.676	0.824	0.529	0.541	0.566
PHILLIPS PETROLEUM CO	P	0.538	0.588	0.501	0.468	0.558
PIONEER HI-BRED INTERNATIONL	PHYB	0.864	0.810	0.642	0.581	0.644
PITNEY BOWES INC	PBI	0.559	0.386	0.378	0.463	0.598
PITTSTON CO-SERVICES GROUP	PZS	0.745	0.585		0.978	0.749
PLACER DOME INC	PDG	0.966	1.050	0.414	0.428	0.546
PNC BANK CORP	PNC	0.485	0.355	0.367	0.445	0.415
POLAROID CORP	PRD	0.585	0.788	1.070	0.859	0.850
POTLATCH CORP	PCH	0.396	0.397	0.307	0.580	0.391
PPG INDUSTRIES INC	PPG	0.437	0.360	0.435	0.416	0.384
PRAXAIR INC	PX	0.835	0.765	0.549		
PREMARK INTERNATIONAL INC	PMI	0.831	0.843	1.117	0.750	0.645
PRICE/COSTCO INC	PCCW	1.393	0.278			
PROCTER & GAMBLE CO	PG	0.286	0.324	0.301	0.449	0.445
PROVIDIAN CORP	PVN	0.504	0.467	0.513	0.593	0.597
PSI RESOURCES INC	CIN2		1.236	0.784	0.814	0.588
PUBLIC SERVICE ENTRP	PEG	0.367	0.419	0.424	0.377	0.308
PULTE CORP	PHM	0.753	0.829	1.186	0.488	0.474
QUAKER OATS CO	OAT	1.339	0.730	0.739	0.542	0.617
RALSTON PURINA GROUP	RAL	0.449	0.202		0.376	0.540
RAYCHEM CORP	RYC	0.595	0.734	0.586	0.667	0.958
RAYTHEON CO	RTN	0.590	0.440	0.454	0.776	0.772
REEBOK INTERNATIONAL LTD	RBK	0.702	1.086	1.284	1.312	0.790
REYNOLDS METALS CO	RLM	0.883	0.977	0.929	0.859	1.142
RITE AID CORP	RAD	1.024	0.660	0.527	0.741	0.514
ROADWAY SERVICES INC	ROAD	1.227	1.172	1.253	0.920	0.638
ROCKWELL INTL CORP	ROK	0.365	0.354	0.328	0.292	0.325
ROHM & HAAS CO	ROH	0.458	0.392	0.392	0.291	0.257
ROLLINS ENVIRONMENTAL SVCS	REN	0.551	0.936	0.873	0.932	0.743
ROWAN COS INC	RDC	0.895	0.883	1.055	1.147	0.968

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
ROYAL DUTCH PET -NY REG	RD	0.262	0.641	0.344	0.288	0.252
RUBBERMAID INC	RBD	0.515	0.378	0.353	0.308	0.309
RUSSELL CORP	RML	0.397	0.425	0.410	0.395	0.358
RYAN'S FAMILY STK HOUSES INC	RYAN	0.951	1.462	1.822	1.675	1.228
RYDER SYSTEM INC	R	0.686	0.744	0.710	0.683	0.780
SAFECO CORP	SAFC	1.071	1.005	0.758	0.765	0.792
SAFETY-KLEEN CORP	SK	0.735	0.859	0.546	0.691	0.582
SALOMON INC	SB	0.797	0.651	0.731	1.472	0.755
SANTA FE ENERGY RESOURCES	SFR	0.349	0.439	0.494	0.453	0.261
SANTA FE PACIFIC CORP	SFX	1.087	0.762	0.720	0.583	0.420
SARA LEE CORP	SLE	0.505	0.407	0.335	0.406	0.583
SBC COMMUNICATIONS INC	SBC	0.305	0.269	0.295	0.305	0.311
SCECORP	SCE	0.557	0.421	0.297	0.313	0.321
SCHERING-PLOUGH	SGP	0.740	0.835	0.717	0.911	0.566
SCHLUMBERGER LTD	SLB	0.557	0.615	0.615	0.612	0.646
SCIENTIFIC-ATLANTA INC	SFA	1.608	1.789	1.418	1.023	1.107
SCOTT PAPER CO	SPP	1.426	0.757	0.671	0.664	0.675
SEAGRAM CO LTD	VO	0.272	0.248	0.191	0.238	0.315
SEARS ROEBUCK & CO	S	0.669	0.716	0.574	0.475	0.459
SERVICE CORP INTERNATIONAL	SRV	0.494	0.670	0.649	0.768	0.725
SHARED MEDICAL SYSTEMS CORP	SMED	1.711	1.356	1.287	1.792	1.041
SHAWMUT NATIONAL CORP	SNC	1.081	1.162	1.052	1.356	0.724
SHERWIN-WILLIAMS CO	SHW	0.512	0.423	0.447	0.538	0.533
SHONEY'S INC	SHN	1.089	1.151	1.158	0.665	0.554
SKYLINE CORP	SKY	0.576	0.755	0.698	0.497	0.529
SNAP-ON INC	SNA	0.591	0.467	0.492	0.493	0.430
SONAT INC	SNT	0.743	0.826	0.692	0.709	0.638
SOUTHERN CO	SO	0.316	0.271	0.297	0.355	0.374
SPRINGS INDUSTRIES -CL A	SMI	0.368	0.405	0.421	0.379	0.379
SPRINT CORP	FON	0.637	0.546	0.613	0.646	0.901
SPX CORP	SPW	0.463	0.436	0.614	0.580	0.553
ST JUDE MEDICAL INC	STJM	1.852	2.460	2.874	2.247	2.463
ST PAUL COS	SPC	0.601	0.528	0.542	0.972	1.243
STANLEY WORKS	SWK	0.295	0.319	0.381	0.343	0.295
STONE CONTAINER CORP	STO	1.837	1.868	1.442	1.383	0.715
STRIDE RITE CORP	SRR	0.844	1.045	1.346	0.986	1.251
SUN CO INC	SUN	0.566	0.460	0.329	0.290	0.278
SUN MICROSYSTEMS INC	SUNW	3.906	3.957	3.844	4.104	3.898
SUNTRUST BANKS INC	STI	0.258	0.274	0.232	0.286	0.277

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
SUPERVALU INC	SVU	0.717	0.539	0.504	0.543	0.440
SYNTEX CORP	SYN		0.962	1.218	0.936	0.980
SYSCO CORP	SYY	0.503	0.446	0.456	0.493	0.478
TANDEM COMPUTERS INC	TDM	1.245	1.122	0.924	1.048	1.424
TANDY CORP	TAN	1.218	1.142	1.098	0.639	0.720
TEKTRONIX INC	TEK	1.112	0.657	0.804	1.126	0.791
TELE-COMM -SER A TCI GRP	TCOMA	1.143	1.561	1.032	0.708	0.978
TELEDYNE INC	TDY	0.534	0.517	0.500	0.475	0.351
TEMPLE-INLAND INC	TIN	0.642	0.635	0.586	0.557	0.466
TENET HEALTHCARE CORP	THC	1.051	1.361	1.011	1.097	0.854
TENNECO INC	TEN	0.718	0.699	0.607	1.015	0.749
TEXACO INC	TX	0.546	0.645	0.615	0.567	0.731
TEXAS INSTRUMENTS INC	TXN	2.154	1.968	1.209	1.227	1.206
TEXAS UTILITIES CO	TXU	0.576	0.588	0.690	0.646	1.049
TEXTRON INC	TXT	0.462	0.463	0.401	0.461	0.427
THOMAS & BETTS CORP	TNB	0.511	0.477	0.447	0.465	0.402
TIME WARNER INC	TWX	0.668	0.714	0.767	0.974	0.904
TIMES MIRROR COMPANY -SER A	TMC	0.441	0.343	0.236	0.249	0.289
TIMKEN CO	TKR	0.488	0.448	0.371	0.447	0.462
TJX COMPANIES INC	TJX	1.382	1.138	0.879	0.815	0.647
TORCHMARK CORP	TMK	0.471	0.394	0.382	0.310	0.343
TOYS R US INC	TOY	0.690	0.605	0.649	0.705	0.769
TRANSAMERICA CORP	TA	0.378	0.387	0.324	0.442	0.348
TRANSCO ENERGY CO	E	0.660	0.639	1.096	1.191	0.632
TRAVELERS GROUP INC	TRV	0.627	0.612	0.587	0.710	0.775
TRIBUNE CO	TRB	0.627	0.457	0.356	0.397	0.455
TRINOVA CORP	TNV	0.665	0.622	0.659	0.716	0.732
TRW INC	TRW	0.475	0.600	0.464	0.388	0.443
TYCO INTL INC	TYC	0.894	0.491	0.521	0.853	
U S BANCORP	USBC	0.998	0.666	0.706	1.259	1.153
U S SURGICAL CORP	USS	3.215	3.229	2.631	1.532	1.219
U S WEST INC	USW	0.412	0.374	0.262	0.287	0.292
UAL CORP	UAL	2.751	2.379	2.169	2.042	3.421
UNILEVER N V -NY SHARES	UN	0.198	0.544	0.372	0.365	0.276
UNION CAMP CORP	UCC	0.543	0.588	0.704	0.667	0.575
UNION CARBIDE CORP	UK	1.262	1.150	1.451	0.832	1.208
UNION ELECTRIC CO	UEP	0.395	0.328	0.393	0.439	0.327
UNION PACIFIC CORP	UNP	0.526	0.389	0.389	0.464	0.505
UNISYS CORP	UIS	1.519	1.433	2.137	1.230	1.221

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
UNITED TECHNOLOGIES CORP	UTX	0.711	0.636	0.712	0.764	0.650
UNOCAL CORP	UCL	0.564	0.757	0.761	0.679	0.647
UPJOHN CO	UPJ	0.755	0.725	0.982	1.269	1.050
USAIR GROUP	U	2.139	2.513	1.879	1.827	1.297
USF&G CORP	FG	0.770	0.981	1.137	1.207	0.968
USLIFE CORP	USH	0.418	0.513	0.565	0.544	0.602
UST INC	UST	0.516	0.661	0.378	0.394	0.412
USX-MARATHON GROUP	MRO	0.468	0.453	0.731	0.619	
USX-U S STEEL GROUP	X	1.389	1.433	0.938	1.053	
VARITY CORP	VAT	1.187	1.432	0.865	0.648	0.650
VF CORP	VFC	0.531	1.002	0.590	0.521	0.547
WACHOVIA CORP	WB	0.316	0.367	0.193	0.261	0.249
WAL-MART STORES	WMT	0.288	0.363	0.253	0.291	0.341
WALGREEN CO	WAG	0.537	0.424	0.385	0.489	0.482
WARNER-LAMBERT CO	WLA	0.750	0.848	0.762	0.891	0.673
WELLS FARGO & CO	WFC	0.897	1.222	1.600	1.706	1.482
WENDY'S INTERNATIONAL INC	WEN	0.794	0.946	1.051	1.320	0.881
WESTINGHOUSE ELECTRIC CORP	WX	0.748	0.783	0.806	0.915	0.610
WESTVACO CORP	W	0.449	0.318	0.274	0.325	0.277
WEYERHAEUSER CO	WY	0.653	0.830	0.619	0.564	0.427
WHIRLPOOL CORP	WHR	0.907	0.861	0.717	0.689	0.544
WHITMAN CORP	WH	0.379	0.399	0.378	0.621	0.636
WILLIAMS COS INC	WMB	1.445	0.994	1.048	0.701	0.878
WINN-DIXIE STORES INC	WIN	0.169	0.220	0.171	0.140	0.179
WMX TECHNOLOGIES INC	WMX	0.653	0.712	0.539	0.589	0.556
WOOLWORTH CORP	Z	1.199	0.912	0.726	0.811	0.770
WORTHINGTON INDUSTRIES	WTHG	0.491	0.597	0.528	0.694	0.485
WRIGLEY (WM) JR CO	WWY	0.278	0.249	0.215	0.177	0.154
XEROX CORP	XRX	0.797	0.836	0.660	0.857	0.760
YELLOW CORP	YELL	1.957	1.491	1.096	1.328	1.131
ZENITH ELECTRONICS CORP	ZE	2.001	1.004	1.064	0.693	0.919
ZURN INDUSTRIES INC	ZRN	0.641	0.752	0.664	0.786	0.823
TOTAL		0.710	0.713	0.635	0.653	0.640

S P 500 SHARE TURNOVER DATA

COMPANY	Ticker	SHARE TURNOVER 1994	1993	1992	1991	1990
SUMMARY STATISTICS						
COUNT		490	500	495	496	491
SUM						
MINIMUM		0.159	0.077	0.076	0.086	0.124
MAXIMUM		9.053	6.522	5.444	6.332	4.219
AVERAGE		0.829	0.824	0.769	0.787	0.758
MEDIAN		0.655	0.658	0.621	0.622	0.610
STD		0.690	0.697	0.590	0.634	0.560

TELEPHONE SHARE TURNOVER DATA

COMPANY	TICKER	SHARES OUTSTANDING 1994	1993	1992	1991	1990	SHARES TRADED 1994	1993	1992	1991	1990
ALLTEL CORP	AT	187.981	187.458	92.339	79.192	79.219	53.567	52.188	24.585	18.445	24.555
AMERITECH CORP	AIT	551.462	273.322	270.172	266.633	264.326	133.313	86.990	56.561	58.619	62.317
AT&T CORP	T	1,569.006	1,352.398	1,339.831	1,309.352	1,092.143	514.170	471.191	428.910	457.365	416.450
BELL ATLANTIC CORP	BEL	436.186	436.080	433.969	396.051	393.191	125.970	136.161	134.770	103.132	103.861
BELLSOUTH CORP	BLS	496.243	496.087	493.793	486.698	481.972	134.494	102.872	106.266	88.838	100.221
CENTURY TELEPHONE ENTERPRISE	CTL	53.574	51.295	32.833	31.365	30.834	24.448	31.771	19.801	10.031	11.945
CINCINNATI BELL INC	CSN	65.948	64.982	61.955	61.595	60.937	11.522	15.872	12.503	12.121	10.322
FRONTIER CORP	FRO	73.161	33.968	33.319	31.843	28.861	26.195	9.927	8.319	7.010	8.004
GTE CORP	GTE	965.085	951.762	939.530	888.907	669.392	357.355	292.909	287.960	298.456	242.835
LINCOLN TELECOMMUNICATIONS	LTEC	32.348	16.488	16.335	16.422	16.467	12.482	6.246	5.333	3.944	3.755
MCI COMMUNICATIONS	MCIC	680.000	541.000	263.000	259.000	254.000	773.084	783.086	299.995	363.781	572.181
NYNEX CORP	NYN	423.597	414.885	206.824	203.724	200.096	153.105	141.789	62.521	62.370	82.370
PACIFIC TELECOM INC	PTCM	39.620	39.609	39.545	39.487	39.408	4.378	3.645	3.284	3.076	2.817
PACIFIC TELESIS GROUP	PAC	424.065	423.059	405.092	401.018	399.459	202.877	181.813	128.073	112.334	121.710
SBC COMMUNICATIONS INC	SBC	609.082	600.234	299.873	300.158	299.869	185.578	161.593	88.551	91.590	93.292
SOUTHERN NEW ENG TELECOMM	SNG	64.506	63.850	63.359	62.632	62.040	14.968	20.046	15.370	13.410	22.110
SPRINT CORP	FON	348.300	343.400	220.659	218.163	214.935	222.028	187.477	135.276	140.942	193.720
TELEPHONE & DATA	TDS	54.824	50.385	41.247	34.964	30.317	25.313	22.696	17.538	13.513	10.365
U S WEST INC	USW	469.343	441.140	414.462	409.936	393.493	193.206	165.130	108.728	117.640	115.005
TOTAL		7,544.331	6,781.402	5,668.137	5,497.140	5,010.959	3,168.053	2,873.402	1,944.344	1,976.617	2,197.835
SUMMARY STATISTICS											
COUNT		19	19	19	19	19	19	19	19	19	19
SUM		7,544.331	6,781.402	5,668.137	5,497.140	5,010.959	3,168.053	2,873.402	1,944.344	1,976.617	2,197.835
MINIMUM		32.348	16.488	16.335	16.422	16.467	4.378	3.645	3.284	3.076	2.817
MAXIMUM		1,569.006	1,352.398	1,339.831	1,309.352	1,092.143	773.084	783.086	428.910	457.365	572.181
AVERAGE		397.070	356.916	298.323	289.323	263.735	166.740	151.232	102.334	104.032	115.676
MEDIAN		423.597	343.400	220.659	218.163	214.935	133.313	102.872	62.521	62.370	82.370
STD		389.451	349.095	341.615	331.085	273.811	197.795	192.919	118.003	130.502	151.448

APPENDIX I
Exhibit 4

TELEPHONE SHARE TURNOVER DATA

COMPANY	TICKER	SHARE TURNOVER 1994	1993	1992	1991	1990
ALLTEL CORP	AT	0.285	0.278	0.266	0.233	0.310
AMERITECH CORP	AIT	0.242	0.318	0.209	0.220	0.236
AT&T CORP	T	0.328	0.348	0.320	0.349	0.381
BELL ATLANTIC CORP	BEL	0.289	0.312	0.311	0.260	0.264
BELLSOUTH CORP	BLS	0.271	0.207	0.215	0.183	0.208
CENTURY TELEPHONE ENTERPRISE	CTL	0.456	0.619	0.603	0.320	0.387
CINCINNATI BELL INC	CSN	0.175	0.244	0.202	0.197	0.169
FRONTIER CORP	FRO	0.358	0.292	0.250	0.220	0.277
GTE CORP	GTE	0.370	0.308	0.306	0.336	0.363
LINCOLN TELECOMMUNICATIONS	LTEC	0.386	0.379	0.326	0.240	0.228
MCI COMMUNICATIONS	MCIC	1.137	1.447	1.141	1.405	2.253
NYNEX CORP	NYN	0.361	0.342	0.302	0.306	0.412
PACIFIC TELECOM INC	PTCM	0.110	0.092	0.083	0.078	0.071
PACIFIC TELESIS GROUP	PAC	0.478	0.430	0.316	0.280	0.305
SBC COMMUNICATIONS INC	SBC	0.305	0.269	0.295	0.305	0.311
SOUTHERN NEW ENG TELECOMM	SNG	0.232	0.314	0.243	0.214	0.356
SPRINT CORP	FON	0.637	0.546	0.613	0.646	0.901
TELEPHONE & DATA	TDS	0.462	0.450	0.425	0.386	0.342
U S WEST INC	USW	0.412	0.374	0.262	0.287	0.292
TOTAL		0.420	0.424	0.343	0.360	0.439
SUMMARY STATISTICS						
COUNT		19	19	19	19	19
SUM		7.294	7.569	6.688	6.465	8.066
MINIMUM		0.110	0.092	0.083	0.078	0.071
MAXIMUM		1.137	1.447	1.141	1.405	2.253
AVERAGE		0.384	0.398	0.352	0.340	0.425
MEDIAN		0.358	0.318	0.302	0.280	0.310
STD		0.218	0.280	0.229	0.281	0.472

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-01051B-99-0105

EXHIBITS

OF

PETER C. CUMMINGS

QWEST CORPORATION

August 21, 2000

INDUSTRY GROUP BETAS

TIC		Value Line	Merrill Lynch	Avg Beta	Notes:
	Electric Companies				
AYE	Allegheny	0.60		0.60	
LNT	Alliant Energy Corp	NMF			
AEE	Ameren Corp	0.55	0.42	0.49	
CNL	CLECO Corp	0.50		0.50	
CEG	Constellation (Baltimore Gas & Electric)	0.50	0.48	0.49	
CPL	Carolina Power & Light	0.55	0.47	0.51	Now CP&L Energy Inc
ED	Consolidated Edison	0.55	0.48	0.52	
DTE	DTE Energy	0.60	0.32	0.46	
DTE	Dominion Resources	0.55	0.44	0.50	
DUK	Duke Energy	0.50	0.36	0.43	
EIX	Edison International	0.65	0.28	0.47	
NEG	EnergyEast (NYSEG)	0.60	0.45	0.53	
FPL	Florida Power & Light	0.45	0.44	0.45	Now FPL Group Inc
FPC	Florida Progress Co.	0.45		0.45	
HE	Hawaiian Electric Industries	0.50	0.43	0.47	
KLT	Kansas City Power & Light	0.60		0.60	
LGE	LG & E Energy	0.60		0.60	
MDSN	Madison Gas & Electric	0.45		0.45	
NCE	New Century Energies	0.50	0.40	0.45	
NSP	Northern States Power	0.55	0.54	0.55	
OGE	OGE Energy (Oklahoma G&E)	0.45	0.39	0.42	
OTTR	Otter Tail Power	0.60		0.60	
PCG	PG&E Corp (Pacific Gas & Electric)	0.45	0.36	0.41	
POM	Potomac Electric Power Corp. (PEPCO)	0.50	0.45	0.48	
PPL	PP&L Resources	0.60	0.49	0.55	
REI	Reliant Energy	0.60	0.50	0.55	
SRE	Sempra Energy	0.50		0.50	
SCG	SCANA Corp	0.45		0.45	
TE	TECO Energy (Tampa Electric)	0.50	0.44	0.47	
WR	Western Resources	0.30		0.30	
WEC	Wisconisn Energy (WEPCO)	0.50	0.46	0.48	
WPS	WPS Resources (Wisc. Pub. Serv.)	0.55		0.55	
	Average	**0.52**	**0.43**	**0.49**	
	Gas Distribution Companies				
ATG	AGL Resources	0.60	0.65	0.63	
ATO	Atmos Energy Corp	0.55	0.46	0.51	
CGC	Cascade Natural Gas Corp	0.55	0.40	0.48	
NJR	New Jersey Resources	0.55	0.63	0.59	
NWNG	Northwest Natural Gas	0.60	0.45	0.53	
PNY	Piedmont Natural Gas	0.60	0.54	0.57	
SJI	South Jersey Industries	0.50	0.52	0.51	
	Average	**0.56**	**0.52**	**0.55**	

INDUSTRY GROUP BETAS

TIC		Value Line	Merrill Lynch	Avg Beta	Notes:
	Telcos				
VZ	Verizon	0.85	0.87	0.86	Avg of BEL & GTE 6/30/00
BLS	BellSouth	0.85	0.69	0.77	
SBC	SBC Communications	0.85	0.90	0.88	
CZN	Citizens Communications	0.70		0.70	
CTL	CenturyTel	0.95	1.04	1.00	
TDS	Telephone & Data Systems	0.70	0.90	0.80	
	Average	**0.82**	**0.88**	**0.84**	
	Insurance Companies				
BKLY	Berkley (W. R.)	0.85	0.84	0.85	
CB	Chubb Corp	1.20	1.06	1.13	
CINF	Cincinnati Financial Group	0.80		0.80	
OCAS	Ohio Casualty Corp	0.80		0.80	
SAFC	SAFECO Corp	1.10	0.90	1.00	
SPC	St. Paul Cos	1.05	1.03	1.04	
SIGI	Selective Insurance	0.65	0.61	0.63	
TRH	Transatlantic Holding	0.70		0.70	
AIG	American International Group	1.40		1.40	
UNIT	Unitrin Inc	0.80		0.80	
	Average	**0.94**	**0.89**	**0.92**	
	Interexchange Carriers				
AT	ALLTEL	0.75	0.75	0.75	
T	AT&T	0.95	0.98	0.97	
Q	Qwest	1.60		1.60	
WCOM	WorldCom	NMF	1.17	1.17	
LVLT	Level 3	NMF			
	Average	**1.10**	**0.97**	**1.12**	
	Competitive Local Exchange Carriers				
ALGX	Allegiance Tele	NMF	2.07	2.07	
ELIX	ELI (Electric Lightwave)	1.65		1.65	
MCLD	McLeodUSA	1.35	1.05	1.20	
NXLK	NEXTLINK	1.45		1.45	
	Average	**1.48**	**1.56**	**1.59**	

Sources: Merrill Lynch Quantitative Profiles, July 2000.
Value Line Investment Survey, August 11, 2000.
Value Line Investment Survey - Expanded Edition, August 11, 2000.

DCF COST OF EQUITY CAPITAL
TELECOMMUNICATIONS COMPANIES

(Using Data from Hill Schedules 5 and 6)

COMPANY	DIVIDEND YIELD Schedule 6	ANALYSTS GROWTH RATE Schedule 5	DCF COST OF EQUITY CAPITAL
Bell Atlantic	3.16%	11.39%	14.55%
BellSouth	1.63%	11.38%	13.01%
GTE	2.95%	11.90%	14.85%
SBC	2.31%	12.99%	15.30%
		AVERAGE	**14.43%**
		STANDARD DEVIATION	**0.99%**

DCF COST OF EQUITY CAPITAL
INSURANCE COMPANIES
(Using Data from Hill Schedules 5 and 6)

COMPANY	DIVIDEND YIELD Schedule 6	ANALYSTS GROWTH RATE Schedule 5	DCF COST OF EQUITY CAPITAL
W.R. Berkley	2.40%	14.00%	16.40%
Chubb Corp	2.00%	11.78%	13.78%
Cincinnati Financial	1.91%	10.00%	11.91%
Ohio Casualty	6.91%	10.00%	16.91%
SAFECO	6.81%	9.38%	16.19%
St. Paul Cos	2.95%	10.07%	13.02%
Selective Ins Group	3.16%	9.00%	12.16%
Transatlantic Holdings	0.58%	9.00%	9.58%
American International Group	0.12%	14.30%	14.42%
Unitrin	4.62%	n/a	n/a
		AVERAGE	**13.82%**
		STANDARD DEVIATION	**2.43%**

DCF COST OF EQUITY CAPITAL
GAS DISTRIBUTION COMPANIES
(Using Data from Hill Schedules 5 and 6)

COMPANY	DIVIDEND YIELD Schedule 6	ANALYSTS GROWTH RATE Schedule 5	DCF COST OF EQUITY CAPITAL
AGL Resources	6.49%	5.37%	11.86%
Atmos Energy Corp	6.90%	7.33%	14.23%
Cascade Natural Gas	5.66%	4.67%	10.33%
New Jersey Resources	4.33%	6.63%	10.96%
Northwest Natural Gas	5.78%	4.02%	9.80%
Piedmont Natural Gas	5.05%	5.57%	10.62%
South Jersey Industries	5.61%	5.25%	10.86%
		AVERAGE	**11.24%**
		STANDARD DEVIATION	**1.46%**

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105

STATE OF WASHINGTON)
: ss AFFIDAVIT OF PETER C. CUMMINGS
COUNTY OF KING)

Peter C. Cummings, of lawful age being first duly sworn, depose and states:

1. My name is Peter C. Cummings. I am Director – Finance & Economic Analysis of Qwest Corporation in Seattle, Washington. I have caused to be filed written testimony and exhibits in support of U S WEST Communications, Inc. (Now Qwest Corporation) in Docket No. T-01051B-99-105.

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Peter C. Cummings

SUBSCRIBED AND SWORN to before me this 17th day of August, 2000.

Notary Public residing at Seattle, Washington

NOTARY PUBLIC
COMMISSION EXPIRES 8-08-02
STATE OF WASHINGTON

My Commission Expires: 8/8/02

EXHIBIT
Q-23
Admitted

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC. A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES	)	DOCKET NO. T-01051B-99-0105

REBUTTAL TESTIMONY OF

PHILIP E. GRATE

QWEST CORPORATION

August 21, 2000

REBUTTAL TESTIMONY OF PHILIP E. GRATE

INDEX OF TESTIMONY

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PENSION ASSET **36**

INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Philip E. Grate. My business address is 1600 Bell Plaza, Room 3008, Seattle, Washington 98024.

Q. U S WEST HAS UNDERGONE A NAME CHANGE. HOW WILL YOU REFER TO THE FORMER U S WEST IN YOUR REBUTTAL TESTIMONY?

A. The regulated telecommunications subsidiary of Qwest Communications International, Inc. (formerly U S WEST, Inc.) is now Qwest Corporation. Qwest Corporation is the new name of the former U S WEST Communication, Inc. In my testimony I will refer to the former U S WEST Communications, Inc. as "Qwest" or the "Company."

Q. WHAT IS YOUR POSITION WITH QWEST AND WHAT ARE YOUR RESPONSIBILITIES?

A. I am a State Finance Director. In this capacity I serve as an expert witness for the Company concerning regulatory finance and accounting matters.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL, PROFESSIONAL, AND BUSINESS EXPERIENCE.

A. I earned a Bachelor of Science in Business Administration degree with a concentration in accounting and a Juris Doctorate, both from Indiana University. I have held licenses as a Certified Public Accountant and a lawyer since 1983. I began my professional career as a senior tax consultant in a national public accounting firm. In 1984 I began my employment with Qwest and one of its predecessors, Pacific Northwest Bell Telephone Company, where I have held various positions in tax, accounting, and regulatory finance as described more fully in my curriculum vita which is Exhibit PG-1 to this testimony. My vita also identifies my testimony before state regulatory commissions in several jurisdictions.

Q. HAVE YOU EVER TESTIFIED BEFORE THE ARIZONA CORPORATION COMMISSION?

A. Yes. I have testified in Arizona Corporation Commission Docket No. T-01051B-99-0497 regarding the merger of U S WEST, Inc. and Qwest Communications International Inc. and in Docket No. T-01051B-99-0737 regarding the sale of Qwest exchanges to Citizens Rural.

PURPOSE

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to rebut the pre-filed testimony of Arizona Residential Utilities Consumer Office (RUCO) witness Hugh Larkin, Jr. and Arizona Corporation Commission Staff (Staff) witness Steven C. Carver concerning their proposals to disallow incentive compensation costs from Qwest's 1999 test year. My testimony also rebuts the testimony of Mr. Carver and RUCO witness Ralph C. Smith to remove Pension Asset from Qwest's ratebase.

INCENTIVE COMPENSATION

Q. WHAT HAVE STAFF AND RUCO PROPOSED REGARDING QWEST'S INCENTIVE COMPENSATION COSTS?

A. The following chart indicates Staff's and RUCO's proposed disallowances of QWEST's incentive compensation expenses for four incentive compensation plans.

Incentive Compensation Plan	Staff's proposed disallowance	RUCO's proposed disallowance
Short Term Incentive Plan for officers (STIP)	100%	50%
Annual Bonus Plan for managers (APB)	100%	50%
IT-Career Structure Bonus Plan for Information Technology employees (ITCSBP)	100%	50%

Long Term Incentive Plan for officers (LTIP)	100%	100%

Q. PLEASE DESCRIBE THESE FOUR PLANS.

A. In general, the plans are as follows:

Short Term Incentive Plan (STIP). The STIP is for the Company's Officers. The 1999 STIP provides annual cash bonus payouts based on objective Company performance measures set in the first quarter of each year and approved by the Board of Directors. An executive's target opportunity is set forth each year using market data, and is communicated as a percentage of salary. An executive can be paid above or below his/her target opportunity.

Annual Bonus Plan (ABP). The ABP covers managers below the Officer level. Objective Company performance measures are set in the first quarter of each year. An employee's target opportunity is set each year, and communicated as a percentage of salary. An employee can be paid above or below his/her target opportunity. The Board of Directors approves the corporate component of the bonuses, which, as detailed below, utilizes the same measures as an executive's STIP.

IT-Career Structure Bonus Plan (ITCSBP). The ITCSBP is for employees participating in the Information Technologies Career Structure which is a technical career progression for Information Technologies (IT) personnel. The purpose of the program is to improve the overall performance of the IT organization and to reward individuals for their specific contributions to this improvement and success.

Long Term Incentive Plan (LTIP). Both officers and managers were eligible for the LTIP. The LTIP has been replaced with a plan that relies exclusively on stock options, which generate no operating expense.

Q. WHAT WERE THE STIP AND APB PERFORMANCE CRITERIA IN EFFECT DURING THE TEST PERIOD?

A. During the test period, the following performance criteria were in effect:

	STIP	ABP
Net Income	20%	12%
Net Cash Flow	20%	12%
Total Revenue	20%	12%
Customer Value Analysis (CVA)		
Consumer CVA	10%	6%
Small Business Group CVA	10%	6%
Bus. & Gov't Services CVA	10%	6%
Wholesale Service Quality Measures	10%	6%
Individual Business Unit Results		40%
Total	100%	100%

Q. DO YOU OPPOSE ADJUSTING LTIP EXPENSES OUT OF THE TEST YEAR?

A. No. The 1997 Long Term Incentive Plan (LTIP) expired at the end of 1999 and paid out in 2000. The 1998 LTIP will expire at the end of 2000 and pay out in 2001. The company recorded expenses for the third and fourth quarters of 2000 in June and July of 2000. The LTIP has been replaced with a plan that relies exclusively on stock options, which generate no operating expense. Consequently, the Company expects to bear no expenses for LTIP after 2000. Accordingly, I do not oppose the removal of this expense.

Q. DO YOU OPPOSE STAFF'S AND RUCO'S PROPOSED DISALLOWANCE OF STIP, ABP AND ITCSBP EXPENSES?

A. Yes. To the extent costs are necessary and prudently incurred in the conduct of the utility's business and reasonable in amount, they should

1 not be disallowed.1 Neither Staff nor RUCO have shown these incentive
2 compensation plans to be unnecessary or imprudent. Nor have they
3 asserted that the amount of compensation Qwest pays its employees is
4 unreasonable in amount. Instead, they offer various arguments that are
5 founded not on sound ratemaking principles but, instead, (in RUCO's
6 case) on a very coarsely applied benefits argument and (in Staff's case)
7 an undefined standard that would relieve ratepayers from paying the full
8 cost of providing service to the extent the Staff does not approve of the
9 specific components of or the "focus" of a utility's incentive compensation
10 plan.

11 The only benefit ratepayers get from a regulated utility is service. Their
12 only obligation to it is to pay regulated rates for the services they receive.
13 Under cost of service regulation, ratepayers are protected from whatever
14 market power utilities possess by the setting of rates based on cost and
15 no more; utilities are protected from confiscation by the setting of rates
16 based on cost and no less. These costs include operating expenses and
17 a reasonable allowance of a return on invested capital. Costs are to be
18 ascertained, not created, by regulation; otherwise the allowance of a
19 return becomes a farce.

---

[1] "One standard of reasonable rates can fairly be said to outrank all others in importance attached to it by experts and public opinion alike—the standard of costs of service, often qualified by the stipulation that the relevant cost is necessary, true (i.e., private and social) cost or reasonably or prudently incurred." Principles of Public Utility Rates, Bonbright, Danielsen and Kamerschen, Public Utility Reports, Inc. (1988), p. 109

If the cost of all other forms of compensation of an employee are allowed recovery for ratemaking purposes, nothing justifies disallowing the cost of the incentive compensation of that employee because the work the employee does cannot be divided between work for incentive pay and work for all other forms of compensation. For example, I do not work one hour for my base pay, a different hour for vacation pay, another hour for my dependent health care benefits and another hour for my incentive compensation. Instead, I do all my work knowing that my performance and the performance of my peers will determine, in part, how much I am paid. The work I do to earn that incentive pay is no different from the work I do to earn my base pay and other benefits. Staff and RUCO attempt to create a completely artificial distinction between employees' work for incentive compensation and their work for base pay and benefits. However, they cannot isolate the portion of the work employees perform that is for incentive pay.

Consequently, by proposing to disallow some of the prudently incurred costs Qwest incurs to pay its employees, Staff and RUCO are proposing that ratepayers get something (the service that requires all the work employees perform) for nothing. As I will explain, their arguments for excluding costs are rationalizations that are not based on sound ratemaking policy or, in many cases, sound reasoning.

Financial Performance Incentives

Q. QWEST'S INCENTIVE COMPENSATION PLANS SET OBJECTIVES FOR NET INCOME, REVENUE AND CASH FLOW. CAN YOU DEMONSTRATE THAT THESE CRITERIA BENEFIT RATEPAYERS?

A. Yes. In summary, the benefit can be shown as follows:

- Incentive compensation is used to motivate employees to, among other things, improve financial performance and accomplish strategic objectives.
- Employees cause improvements in financial performance by improving efficiency. They improve efficiency by innovating to cut costs and improve productivity. This improved productivity is embedded in the test year expenses.
- Improvement in financial performance is the yardstick that measures the tangible results of reduced costs and increased productivity. If financial performance does not improve, then the results have not been achieved. The calculus of the benefit is straightforward. If costs decrease, earnings increase. If cash is spent more wisely, cash flow improves. So financial improvement is the inevitable result of productivity, cost reduction and cash preservation improvements.
- The shareholder of a cost-of-service-regulated business only gets the benefit of the financial improvement temporarily--during the period of

regulatory lag. Regulatory lag is the period between the time the benefit appears in results of operations and the time it becomes rate effecting, which is the period of one to two years that is required to conduct a rate proceeding (if one is required). When the financial improvement occurs, it becomes part of an historical test period and reduces revenue requirement derived from that test period. So the productivity improvements inure to the benefit of ratepayers in the form of higher test year earnings that lower revenue requirement and, thereby support lower rates for services. In the next series of questions, I provide an illustration that demonstrates mathematically the process by which the benefit of improved financial performance inures to ratepayers.

- Similarly, cash flow improvements benefit ratepayers by lowering the cost of capital because investors base the price they require for their capital on the cash flows of the enterprise.

Q. PLEASE DESCRIBE THE FOUNDATION OF YOUR ILLUSTRATION.

A. Suppose that in Arizona there are two utilities—Utility #1 and Utility #2—that are identical except for certain exceptions I will mention. To make the example easy to follow, assume both utilities sell only one service. Also assume that the Commission has set their rates based on an allowed return on equity of 10%.

1 Assume that during 1998 each utility sold $10 of service. Each also had
2 $6 of direct expenses and $3 of indirect expenses in 1998. As the
3 following schedule shows, their direct margin was $4 and their net income
4 was $1.

5

Year	--1998--	--1998--
Utility	#1	#2
Revenues	$10.00	$10.00
Direct expenses	6.00	6.00
Direct margin	4.00	4.00
Indirect expenses	3.00	3.00
Net income	$1.00	$1.00

6

7 **Q. PLEASE CONTINUE WITH YOUR ILLUSTRATION.**

8 A. Assume that the net rate base of both utilities in Arizona was $10 in 1998
9 and, to make things simple, that the utilities are financed 100% with
10 equity. As the following schedule shows, the 1998 return on equity is
11 10%.

12

Year	--1998--	--1998--
Utility	#1	#2
Net income	$1.00	$1.00
Equity	$10.00	$10.00
Return on equity	10%	10%

13

14 **Q. PLEASE CONTINUE.**

A. Suppose that Utility #1 adopts an incentive compensation program for 1999 that makes increases in employee compensation dependent upon increased net income and Utility #2, instead, gives its employees an increase in base salary. Further, assume that Utility #1 and Utility #2 end up paying exactly the same level of compensation. The only difference is that the employees of Utility #1 got their full compensation because they met net income goals and the employees of Utility #2 got their full compensation in base pay. Finally, assume that because of Utility #1's incentive compensation program employees were able to reduce indirect expenses by 50 cents so that total expenses in 1999 are $8.50 for Utility #1 and $9.00 for Utility #2. As the following schedule shows, net income would be $1.50 for Utility #1 and $1.00 for Utility #2. Return on equity would be 15% for Utility #1 and 10% for Utility #2.

Year	--1999--	--1999--
Utility	#1	#2
Revenues	$10.00	$10.00
Direct expenses	6.00	6.00
Direct margin	4.00	4.00
Indirect expenses	2.50	3.00
Net income	$1.50	$1.00
Equity	$10.00	$10.00
Return on equity	15%	10%

Q. PLEASE CONTINUE.

A. Assume that a show cause is brought against Utility #1 in 2000 because of its 15% Return on Equity in 1999. Suppose that the Commission finds that the appropriate ROE for the utility is 10%. Based on these facts, the Commission would reduce Utility #1's rates by 50 cents to reduce its earnings from $1.50 per year to $1.00 per year and its return on equity from 15% to 10%. The following schedule shows net income and return on equity before the rate decrease and after the rate decrease.

	Before	After
Utility	#1	#1
Revenues	$10.00	$9.50
Direct expenses	6.00	6.00
Direct margin	4.00	3.50
Indirect expenses	2.50	2.50
Net income	$1.50	$1.00
Equity	$10.00	$10.00
Return on equity	15%	10%

So Utility #1's rates would be $9.50 instead of $10.00 after the order in the show cause.

Q. PLEASE CONTINUE.

A. Let's assume that new rates from the order in the 2000 show cause went into effect on January 1, 2001. We said that Utility #1 achieved a 15% return on equity in 1999 instead of its allowed 10%. The following has happened.

- The shareholders of Utility #1 got to keep the benefit of the return on equity in excess of 10% during 1999 and 2000.
- However, the ratepayers of both utilities paid the identical $10 in rates in 1999 and 2000.
- And, the ratepayers of Utility #1 enjoy the benefit of 50 cent lower rates in 2001 and thereafter.

So, assuming all other things are equal, the ratepayers of Utility #1 were no worse off than the ratepayers of the non-incentive-compensation Utility #2 in 1999 and 2000 and were better off than Utility #2 ratepayers by 50 cents in 2001 and succeeding years. It follows that the incentive compensation plan, which motivates employees to achieve higher net income (and, therefore, a higher ROE for shareholders) also produces benefits for ratepayers through lower revenue requirements.

Q. WHAT IF THERE IS NO RATE CASE OR THERE IS A RATE CASE BUT RATES DO NOT DECREASE? DO RATEPAYERS DERIVE THE BENEFIT OF THE IMPROVED FINANCIAL PERFORMANCE UNDER THESE CIRCUMSTANCES?

A Yes. Under cost of service regulation, ratepayers always benefit from decreases in costs reflected in regulated results of operations. The most obvious instance of ratepayer benefit is when improved financial

performance is reflected in a test year that is used in a rate case that results in rate decreases. It's less obvious but just as true that ratepayers benefit from a cost decrease even if the rate case results in rate increases. Ratepayers also benefit when a cost decrease has a dampening effect on revenue requirement that can discourage a utility from filing a rate case or encourage the filing of a motion to show cause. Regardless of whether a rate action occurs and regardless of its outcome, improved financial performance has a lessening effect on revenue requirement that, in turn, lessens the rates a utility needs for full recovery of its costs.

Q. STAFF ARGUES THAT RATEPAYERS DO NOT BENEFIT FROM INCENTIVE COMPENSATION COST REDUCTIONS (AND BY EXTENSION OF STAFF'S ARGUMENT, INCREASES IN FINANCIAL PERFORMANCE) IN THE ABSENCE OF A RATE PROCEEDING. [CARVER, P. 55, LINES 7—10]. DO YOU AGREE?

A. No. Ratepayers always benefit from an incremental financial improvement, including a cost reduction, regardless of whether or not there is a rate proceeding. An incremental financial improvement incrementally reduces revenue requirement. Whether a rate proceeding is required to adjust rates depends on the total revenue requirement which is the sum of all incremental revenue, expense and rate base

changes. But the fact that a rate proceeding is or is not required does not diminish in any way an incremental change in revenue requirement, such as an improvement in revenues, a decrease in costs or a change in rate base.

Q. STAFF ARGUES THAT SHAREHOLDERS, NOT RATEPAYERS, SHOULD BEAR THE COST OF INCENTIVE COMPENSATION BECAUSE "SHAREHOLDERS BENEFIT THROUGH INCREASED PROFIT, REVENUE AND CASH FLOW RESULTING FROM EMPLOYEES IMPROVING THEIR PERFORMANCE IN PURSUIT OF INCENTIVE COMPENSATION." [CARVER, P. 52, LINES 19--21] WHAT IS YOUR RESPONSE?

A. Mr. Carver's observation is as true as it is incomplete. Shareholders undeniably benefit from improved financial performance caused by employees' pursuit of incentive compensation. However, Mr. Carver fails to take his analysis the next step. He disregards the fact that if shareholders benefit from improved financial results, ratepayers do too. My illustration above shows how this process works. Utility #1's 1999 test year results in my illustration are better because of the improvement in financial performance brought about by incentive compensation. In my illustration, this improvement justifies lowering rates 50 cents, regardless of the effect of other factors.

It is also a very important point, and one Mr. Carver chooses to ignore, that unless shareholders experience the benefit of improved financial performance first, there can be no benefit available to ratepayers; the benefit must first be realized in financial performance—so that it can be known and measurable—before it can properly be reflected in reduced revenue requirement.

The other key point is that shareholders get to enjoy the benefit of incentive compensation only temporarily, during the period of regulatory lag. As my illustration demonstrates, the inclusion of cost savings in a test year captures the benefit for ratepayers who, after the period of regulatory lag, get to enjoy the benefit in subsequent years. So ratepayers and shareholders effectively share the benefit.

Q. RUCO ARGUES THAT BECAUSE RATEPAYERS AND SHAREHOLDERS SHARE THE BENEFIT, RATES SHOULD ONLY INCLUDE 50% OF THE TEST YEAR STIP AND APB EXPENSES. [LARKIN, P. 18, LINES 18—19] WHAT IS YOUR RESPONSE?

A. RUCO argues the Commission should disallow 50% of the STIP and ABP because shareholders will benefit from the improved financial performance that the STIP and ABP are aimed at achieving. Improving financial performance is not automatic; it requires improving business efficiency. If RUCO's rationale were consistently applied in rate making,

then 50% of any cost aimed at fostering or improving business efficiency would have to be disallowed on the basis that shareholders would derive some benefit (albeit temporarily) by incurring that cost. The peril of universally applying this rationale is obvious—it would strongly discourage utilities from incurring costs to improve business efficiency and financial performance (to the benefit of shareholders and ratepayers). RUCO's rationale is not a sound rate making policy and it should not be universally applied. Nor should it be applied to this particular cost as a rationalization to deny recovery.

Q. DOESN'T REGULATORY LAG DEPRIVE RATEPAYERS OF THE BENEFIT OF IMPROVED FINANCIAL PERFORMANCE?

A. No. Regulatory lag is the period of time between the occurrence of an event that affects financial performance and the realization and incorporation of that financial performance into the ratemaking process. Regulatory lag is a regulatory fact of life where historical test years are employed. As such, it does not discriminate against or in favor of ratepayers or shareholders. Instead, it treats them both the same; it uniformly imposes a delay (not a deprivation) in the realization of changes (whether increases or decreases) in financial performance and cost of capital.

1 **Q. STAFF ARGUES THAT "SHAREHOLDERS SHOULD BE 'AT RISK' OR**
2 **RESPONSIBLE FOR THE POTENTIAL INCENTIVE COMPENSATION"**
3 **BECAUSE "SHAREHOLDERS BENEFIT...." [CARVER, P. 52, LINES 20**
4 **THROUGH 22. HOW DO YOU RESPOND?**

5 A. Again, Mr. Carver's analysis fails to go far enough. He argues that if
6 incentive compensation costs are included in the calculation of rates and
7 employees receive no incentive pay or less incentive pay than the amount
8 included in rates, ratepayers would nevertheless be required to fund the
9 allowed level of incentive plan costs. He argues that if Qwest pays less
10 than the full cost, Qwest's profits increase by the difference. [Carver, p.
11 52. Lines 5—12]. The fallacy of Mr. Carver's argument is that it ignores
12 the effect he describes on Qwest's overall profits and financial
13 performance when employees do not achieve financial targets.

14 As one would expect, employers (including Qwest) employ incentive
15 compensation plans to improve profitability by designing them so that
16 employees receive a portion of, but less than all of, the benefits of
17 improved financial performance they achieve. Consequently, as incentive
18 payouts for financial performance increase, so does the employer's
19 overall financial performance. Conversely, the lower the payouts are, the
20 lower the employer's overall financial performance is.

21 Because the Company's overall financial result is lower when payouts on
22 financial performance are lower, investors are already "at risk" and

"responsible for" incentive compensation. Qwest investors are at risk because there is a direct and positive correlation between the level of payouts and the level of Qwest's overall net income.

Q. STAFF ARGUES "THE RATEMAKING RECOGNITION OF INCENTIVE COMPENSATION VIRTUALLY ELIMINATES COMPANY RISK OF LOSS FOR AMOUNTS INCLUDED IN REVENUE REQUIREMENT, AT RATEPAYER EXPENSE." [CARVER, P. 51, LINES 18—20] DO YOU AGREE?

A. No. This argument 1) is a red herring and 2) fails because Mr. Carver's analysis does not go far enough. The argument is a red herring because the words "incentive compensation" could be replaced with any other item of cost recognized in revenue requirement and the statement would be equally applicable. Any cost included in revenue requirement could be (albeit inaccurately) described as "risk free" because, and to the extent, rates are designed to recover it. However, no cost (including incentive compensation) included in a revenue requirement is truly risk free. The inclusion of costs in revenue requirement is not a guarantee of recovery. As Mr. Carver testifies, "Whenever a rate case is filed by a utility, it assumes a risk that the rates filed and ultimately approved will either be inadequate or excessive, no matter what test year approach or series of adjustments are proposed by the parties." [Carver, p. 132, lines 9—11]

1 Revenues realized may be more or less than rates were designed to
2 provide and expenses may be more or less than the amount included in
3 the test year. This is a basic fact of cost-of-service rate making and
4 renders Mr. Carver's statement that inclusion in revenue requirement
5 virtually eliminates risk of loss, at best, irrelevant, if not misleading.

6 Mr. Carver's argument fails to go far enough because it ignores that
7 employees, shareholders and ratepayers all share a unity of interest and,
8 therefore, risk in the outcome of financial performance. When financial
9 performance improves, employees benefit from higher payouts,
10 shareholders benefit from higher overall financial performance and
11 ratepayers benefit from lower revenue requirement. Conversely, lower
12 payouts result from lower overall financial performance, which yields
13 higher revenue requirement. Therefore, incentive compensation is not a
14 risk free proposition for anyone. Ratepayers', shareholders' and
15 employees' financial interests all rise and fall on the same financial
16 performance tide. However, the point and purpose of financial
17 performance incentive compensation is to motivate employees to achieve
18 higher levels of financial performance than they would be motivated to
19 achieve absent the incentive. When employees respond to that
20 motivation and succeed in achieving better financial performance,
21 employees, shareholders and ratepayers all prosper together.

22

Service Quality Incentives

Q. DO THE TEST YEAR STIP AND ABP INCLUDE PERFORMANCE CRITERIA BASED ON SERVICE QUALITY?

A. Yes. Both contain performance criteria for a Customer Value Analysis (CVA) for Consumer, Small Business Group and Business and Government Services. These three CVAs constituted 30% of the STIP performance criteria. The ABP is based 40% on business unit components and 60% on a corporate component that uses the same criteria as the STIP. So the three CVAs make up 30% multiplied by 60%, or 18%, of the ABP.

Both the STIP and ABP also contain two Wholesale Service Quality Measures. One was for provisioning and was weighted at 5% of the STIP and 3% (5% multiplied by 60%) of the ABP. The other was for repair and was weighted at 5% and 3% respectively of the STIP and ABP.

Q. DOES STAFF RECOMMEND DISALLOWANCE OF THE COST OF THE PORTION OF THE ABP AND STIP THAT IS BASED ON THESE SERVICE QUALITY COMPONENTS?

A. Yes. Staff recommends disallowance of the service quality components of the STIP and APB for four reasons. First, Staff complains that the CVA measures customers' perceptions of service quality instead of directly

measuring the timeliness or adequacy of service installations, changes, repairs and overall quality of the specific service provided by Qwest. Second, Staff observes that the 1999 STIP and ABP did not pay out on three of the five service quality measures. Third, Staff asserts that the STIP and ABP are too heavily weighted towards financial measures [Carver, p. 46, line 14 through p. 48, line 11]. Fourth, Staff observes that the service quality components are based on total Company results and do not focus on assessments of service quality in Arizona. [Carver, p. 47, lines 19-22]

Q. DO ANY OF STAFF'S REASONS JUSTIFY DISALLOWANCE OF THE PORTION OF THE ABP AND STIP THAT IS BASED ON THESE SERVICE QUALITY COMPONENTS?

A. No. Qwest adopted the CVA as a measure of service quality because the Company believes it directly measures customer satisfaction. Mr. Carver apparently believes that as measures of service quality, surveys are inferior to direct measures. Placing his own judgement about the best way to measure service quality above the judgement of Qwest's management, Mr. Carver concludes that management's use of surveys instead of direct measures justifies disallowance. While Mr. Carver may prefer direct measures of service quality, he has not shown why his own judgement should be substituted for the judgement of Qwest's

1 management in deciding how to measure service quality for purposes of
2 paying incentive compensation. Nor has he offered substantial reasons
3 that would demonstrate that service quality surveys are defective as
4 measures of service quality such that they justify a disallowance. Staff
5 has not suggested the CVA is harmful to ratepayers' interests. Mr.
6 Carver's apparent preference for a different measure of service quality is
7 not sufficient reason to justify disallowing the cost of incentive
8 compensation based on the CVA.

9 Instead of complaining that the 1999 STIP and ABP did not pay out on
10 three of the five service quality measures, Staff should approve of the
11 discipline with which Qwest executed its incentive compensation plans.
12 The total cost of incentive compensation in the test year is substantially
13 less than it would have been had all service quality targets been met.
14 This lower level of cost shows that Qwest's incentive compensation plans
15 have teeth. Instead of being grounds to disallow the service quality
16 components, this test year cost savings resulting from rigorous application
17 of the standards in the plans should be grounds for applauding the high
18 standards of service quality the Qwest's plans have set and enforced.

19 Mr. Carver's argument that the service quality component of the STIP and
20 ABP should be disallowed because the plans are too heavily weighted
21 towards financial criteria makes no sense. First, Mr. Carver offered no
22 reason why the plans' service quality components should be considered

poisoned by the financial components. Further, in an attempt to support his position, Mr. Carver measures the weighting of the payout instead of the weighting of the plans. Because Qwest conscientiously enforced the service quality standards in the plans they paid out relatively little for service quality. Consequently, the 1999 plan payouts are weighted more heavily towards financials than are the base line criteria in the plans themselves. Inexplicably, Mr. Carver would have the Commission disallow the service quality components of the STIP and ABP because Qwest applied them with rigor, and the result is a relatively low payout for service quality in the test year.

Finally, Mr. Carver observes but fails to acknowledge the significance of the fact that company wide measures of service quality performance include Arizona among the 14 states measured. The weighting of the service quality results reflects the size of Arizona's operations in proportion to the size of the Company's 14 state operations. Likewise, the cost of these plans charged to Arizona operations reflects only the cost of Arizona operations, not the cost of the Company's total 14-state operation. Mr. Carver may prefer that the Company operate 14 separate incentive compensation plans, but his preference is hardly justification for disallowing their costs.

1 **Q. DOES RUCO RECOMMEND DISALLOWANCE OF THE COST OF THE**
2 **PORTION OF THE ABP AND STIP THAT IS BASED ON THESE**
3 **SERVICE QUALITY COMPONENTS?**

4 A. RUCO does not specifically recommend disallowance of the service
5 quality goals. However, Mr. Larkin expresses "significant concern
6 regarding the focus of the plans, particularly when significant payouts
7 were still made under the STIP and ABP plans despite the poor customer
8 service results." [Larkin, p. 20, lines 9 through 11] RUCO makes the
9 same observations about small payouts on service quality components
10 that Staff makes [Larkin p. 20, lines 2 through 7].

11 Mr. Larkin's concern—like Mr. Carver's—is based on the low payouts for
12 service quality in the test year. And like Mr. Carver, he overlooks the fact
13 that those low payouts reduce Qwest's revenue requirement in the test
14 year and that they result from enforcing the standards set in the plan. Mr.
15 Larkin's argument is no different from Mr. Carver's and, like Mr. Carver's,
16 provides no justification for disallowance of the service quality
17 components of the STIP and ABP.

18

19 **Q. DOES STAFF OR RUCO ASSERT THAT THE SERVICE QUALITY**
20 **COMPONENTS OF THE STIP AND ABP ARE UNREASONABLE,**
21 **UNNECESSARY OR IMPRUDENT?**

A. No. Nor do they assert the service quality components of the STIP and ABP are ineffective or contrary to ratepayer interests. They offer no sound reasons for disallowing the service quality components of either the STIP or APB.

Short Term Incentive Plan (STIP)

Q. DO YOU AGREE WITH STAFF'S PROPOSAL TO EXCLUDE 100% OF THE COST OF QWEST'S SHORT TERM INCENTIVE PLAN?

A. No. Staff argues that 100% of the cost of this plan should be removed from the test year because the Commission should not allow Qwest to recover from ratepayers the cost of incentive compensation plans that "focus heavily" on the achievement of increasing financial targets and enhancing corporate profitability and because the financial measures included in the STIP pertain to the Company's operation in all jurisdictions—not just the Company's Arizona operations. [Carver, p. 45, line 8 to p. 46, line 8 and p. 49, lines 5 through 7] Staff is rationalizing.

Mr. Carver's proposed solution is unreasonably punitive. If Mr. Carver believes Qwest management has designed a plan that—at 60%—focuses too heavily on financial results, an appropriate response would be for him to say how much of the plan, in his judgement, could properly be focussed on financial results and still be recoverable in rates. Then he should

1 propose disallowance of the portion of the plan that he believes violates
2 his standard, not the extreme solution of disallowing the entire cost of the
3 plan. If (as he testifies) he believes none of the financial components of
4 the plans should be allowed, then he might well propose disallowing all of
5 the financial performance portions of the plans. My earlier testimony
6 explains how financial incentives benefit ratepayers and I will not repeat it
7 here. But Mr. Carver's argument that the service quality components of
8 the STIP should be disallowed because they are poisoned by the financial
9 components of those plans makes no sense.

10

11 **Q. DO YOU AGREE WITH RUCO'S PROPOSAL TO EXCLUDE 50% OF**
12 **THE COST OF QWEST'S SHORT TERM INCENTIVE PLAN?**

13 A. No. RUCO argues that 50% of the cost of this plan should be removed
14 from the test year because the plan results in benefits to both ratepayers
15 and shareholders [Larkin, p. 18, line 18] and because of "significant
16 concern regarding the focus of the plans, particularly when significant
17 payouts were still made...despite poor customer service results." [Larkin,
18 p. 20, lines 9 through 11]

19 I have already explained why disallowing 50% of costs that foster or
20 improve business efficiency is not a sound rate making policy and should
21 not be applied to this particular cost as a rationalization to deny recovery.
22 So I will not repeat those arguments. I have also explained why Staff's

1 argument to disallow all of a plan because of its focus makes no sense
2 and I will not repeat that explanation. And I have already explained how,
3 under cost of service regulation, ratepayers always benefit from a utility's
4 improved financial performance. RUCO offers rationalizations, not sound
5 reasons for disallowing the incentive compensation pay of employees
6 whose total compensation is otherwise allowable in the calculation of
7 rates.

8

9 **Annual Bonus Plan (ABP)**

10 **Q. DO YOU AGREE WITH STAFF'S AND RUCO'S PROPOSAL TO**
11 **EXCLUDE 100% AND 50% RESPECTIVELY OF QWEST'S ANNUAL**
12 **BONUS PLAN?**

13 A. No. Mr. Larkin relies on the same reasoning that he uses for proposing a
14 50% disallowance of the STIP. My response is the same as it is to his
15 STIP proposal. And while Mr. Larkin asserts that some of the specific
16 business unit goals appear to be in direct conflict with ratepayer concerns,
17 he concludes that the business unit goals appear to benefit both
18 ratepayers and shareholders. [Larkin, p. 19, lines 5 through 20.]

19 Mr. Carver, on the other hand, asserts he is unable to reach any
20 conclusion about any of the business unit goals because he lacks
21 sufficient information to evaluate the reasonableness of the business unit
22 component of the ABP. He makes this allegation despite the fact that

Attachment H in the response to Data Request No. UTI 60-11 contains over 60 pages of information that cover each business unit that charged costs to Arizona regulated operations. He asserts that in order to render an opinion, he must have copies of communications by business units to employees about the business unit goals and takes Qwest to task for not providing it. [Carver, p. 50, line 16 to page 51 line 2] Because he did not get what he wanted, he proposes to disallow all of the cost of the business unit portion of the ABP. [Carver, p. 49, line 10 to page 51 line 2.]

Exhibits PG-2 and PG-3 respectively are the responses of which Mr. Carver complains to Data Request No. UTI 53-02 and Data Request No. UTI 60-11. To the best of my knowledge and belief, the responses provided to these data requests are true and correct. They apparently provide enough detail for at least one witness hostile to Qwest to render an opinion on them.

Q. HOW DO YOU RESPOND TO MR. LARKIN'S ASSERTION THAT SOME OF THE SPECIFIC BUSINESS UNIT GOALS APPEAR TO BE IN DIRECT CONFLICT WITH RATEPAYER CONCERNS. [LARKIN, P. 19, LINES 6 THROUGH 20]

A. I believe that the remedy for work that directly conflicts with ratepayer concerns is to determine whether the work is unnecessary or imprudent, and if it is, to disallow all the costs of it. It makes no sense to disallow

50% of the cost of incentive compensation for all work simply because some work for which incentive compensation is paid may be found to be unnecessary or imprudent. Some of the Arizona work described in Mr. Larkin's testimony is recorded "below the line" in accounts that are not included in the calculation of revenue requirement. Of the work to which Mr. Larkin objects that is "above the line" I do not believe any of it is unnecessary or imprudent for a utility in an increasingly competitive marketplace to undertake and I do not believe the Commission should disallow a reasonable amount of cost for such work. Mr. Larkin's argument that 50% of the costs should be disallowed because some of the objectives he describes are at odds with RUCO's objectives appears retributive. If he believes certain work is objectionable, and it is not already excluded from regulated results of operations, then he can propose its disallowance. But suggesting that a few bad (as he sees it) apples spoils 50% of the whole bushel makes no sense.

Exhibit PG-4 is a copy of a portion of the response to Data Request No. UTI 60-14. I am including the narrative portion of the response and Attachment B, but not Attachment A which is redundant of information provided in my Exhibit PG-3. Attachment B identifies the amount of the business unit portion of the ABP by business unit. If the Commission determines that a business unit's activities should be disallowed, this information will allow the Commission to identify the amount of incentive compensation accrued for the business unit portion of the APB for that

business unit so that the Commission can calculate an appropriate level of disallowance, instead of 50% of the entire ABP.

Q. ARE STAFF'S ARGUMENTS FOR DISALLOWING 100% OF THE CORPORATE COMPONENT OF THE ABP THE SAME AS FOR THE STIP?

A. Yes. [Carver, p. 49, lines 5 through 7] My response is also the same as it was to Staff's STIP arguments. In my opinion, none of the reasons Mr. Carver offers for disallowing 100% of the STIP justify his proposal.

IT-Career Structure Bonus Plan (ITCSBP)

Q. WHY DOES STAFF PROPOSE TO DISALLOW 100% OF QWEST'S IT-CAREER STRUCTURE BONUS PLAN COSTS?

A. Mr. Carver claims that in responding to Staff's discovery, Qwest "has failed to provide detailed plan documentation and other related information concerning this plan." [Carver, p. 44, lines 1 through 3] Exhibit PG-5 is the response of which Mr. Carver complains to Data Request No. UTI 53-03. A review of Attachment A thereto shows that:

- The plan had a payout range of 0% to 10% with a maximum that could go to 12% of participating employees' base salary.
- The payout is comprised of two additive factors:

1. The overall IT business unit results account for 4% with a maximum that could go to 6% if the business unit payout was at 150% of target.
2. Actual individual results demonstrated by the fulfillment of individual performance objectives account for the remaining 6%.

- The individual performance objectives are based on a performance plan drawn up by an IT-Career Structure employee and his or her supervisor.
- For an employee to participate in the business unit component of the plan, the employee must participate in the individual performance portion of the plan by setting objectives and performing against the stated objectives.
- There were four equally weighted elements (each worth 1%) to the business unit component that comprised the 4% payout for overall IT business unit results. The data request response includes descriptions of each. The titles of the four elements for 1999 are:
  1. Financials (meet margin plan)
  2. Service, Batch and On-line Systems Availability
  3. Deliverables
  4. Year 2000 System Results

The response contains no information that supports Mr. Carver's contention that "it appears that the IT-Career Structure Bonus Plan is just another combination of the business unit and corporate components of the ABP...." [Carver, p. 44, lines 1 through 4] There is nothing in the response indicating the ITCSBP contains a corporate component. Instead of a corporate component, the plan contains an individual performance component of 6% that constitutes a 60% weighting in the plan. The response also explains that employees must develop their own individual performance targets and get supervisor approval of those targets.

With all the information the response provides, I can not agree with Mr. Carver's claim that,

> "Without additional information beyond that supplied in these responses, it is difficult to engage in any meaningful review of the plans and assess whether the costs should be charged to the Company's regulated ratepayers." [Carver, p. 44, lines 5 through 7]

Q. DOES STAFF OFFER ANY OTHER REASONS FOR DISALLOWING THE COST OF THE ITCSBP?

A. Yes. Mr. Carver suggests that 100% of the test year cost of the ITCSBP should be disallowed because "the plan will be transferred to an affiliate in the year 2000." [Carver, p. 43, lines 22—25] RUCO also raises a concern about "the significant changes in the IT personnel structure and the uncertainty regarding the allocation of their costs in the future." [Larkin, p. 21, line 7 through p. 22 line 3] However, Mr. Larkin proposes a 50% disallowance instead of Mr. Carver's 100% disallowance. [Larkin, p. 22, lines 3—4] The affiliate issue is only a rationalization for a disallowance.

The employees who were paid under the ITCSBP no longer work for Qwest Corporation and, effective December 31, 1999, have become employees of Qwest Information Technologies, Inc., (Qwest IT, formerly U S WEST Information Technologies, Inc.). The costs of the plan are now recorded on the books of Qwest IT along with all other costs for these

employees. Qwest bears the expenses of the plan to the extent the costs of Qwest IT employees are affiliate billed to Qwest.

There is no sound reason why the cost of the plan should be 100% disallowed or 50% disallowed because, instead of being incurred directly by Qwest, the cost is now incurred by an affiliate and billed to Qwest through affiliate billing. The cost of the plan should follow and be allowed to the same extent as all other employee compensation costs included in charges affiliate billed to Qwest.

Q. RUCO ALSO EXPRESSES CONCERN ABOUT THE COMPONENTS OF THE PLAN. [LARKIN, P. 21, L. 19 THROUGH P. 22, LINE 4] WHAT IS YOUR RESPONSE?

A. Mr. Larkin asserts that the plan should be subject to disallowance because "one of the components of the 1999 career structure bonus was the achievement of Y2K related goals." [Larkin, p. 21, lines 19 and 20] This argument makes no sense. Obviously, and as Mr. Larkin observes, "Y2K compliance will not be an issue in the future plan years." [Larkin, p. 21, line 23 and p. 22, line 1] However, the fact that a component constituting a 1% payout of the plan will have to be replaced with another objective hardly suggests that any cost of the plan should be disallowed. Y2K is merely a rationalization for a disallowance.

Conclusion

Q. DO YOU HAVE ANY CONCLUDING REMARKS REGARDING INCENTIVE COMPENSATION EXPENSE?

A. The proper test for determining whether a cost should be allowed in the calculation of rates is whether it is necessary, prudently incurred and reasonable in amount. If the cost of an employee's work passes that test, then all of the costs of that employee's work, including incentive compensation, should be included in cost of service. There is no just reason for imposing a special test for incentive compensation, which management, applying its expertise in the art of managing, uses to encourage employees to do their work well and with an eye toward specific objectives. Neither Staff nor RUCO have offered any reason for imposing a special hurdle for incentive compensation that other forms of compensation need not vault. They have used incentive compensation as a target of opportunity to decrease revenue requirement and offered rationalizations to justify their proposals.

PENSION ASSET

Q. DO YOU AGREE WITH RUCO'S AND STAFF'S PROPOSAL TO REMOVE PENSION ASSET FROM RATE BASE? [LARKIN, P. 29, LINE 8 TO P. 33. LINE 9; CARVER, PP. 116-134]

A. No.

Q. PLEASE EXPLAIN WHAT THE PENSION FUND IS.

A. The pension fund is a trust (Pension Trust) that is a separate legal entity from Qwest and, by law, is operated solely for the benefit of participating employees and retirees. This is a very important point that bears repeating. The Pension Trust and Qwest are completely separate legal entities.

Q. IS THERE A SURPLUS IN THE PENSION FUND?

A. Yes. At the end of 1999, the pension plan's total benefit obligation was computed under the rules of Statement of Financial Accounting Standards No. 87 (FAS 87) to be $8.9 billion and the fair value of plan assets was computed to be $14.6 billion. So the surplus was roughly $5.8 billion.

Q. WHY IS THERE A SURPLUS IN THE PENSION FUND?

1 A. Prior to Qwest's adoption of FAS 87 in 1987, the amount of pension
2 expense reported for financial reporting purposes in any given year
3 equaled the amount contributed to the pension fund for that year. The
4 amount contributed was (and remains) subject to limitations under ERISA
5 and federal income tax laws. After the adoption FAS 87, the recognition
6 of pension expense was de-coupled from the amount of funding; pension
7 expense became a computed amount.

8 Similarly, the FAS 87 rules for determining the amount of any surplus or
9 deficit in a pension fund are not tied to the laws governing pension plan
10 funding. So, right out of the box in 1987 the amount of surplus in the
11 pension fund recognized under FAS 87 rules was roughly $1.9 billion,
12 even though Qwest and its predecessors had never over-funded the plan
13 under ERISA and tax laws.

14 While the plan has continued to pay pension benefits, there has been no
15 funding of the Pension Trust since 1987. Nevertheless, the fair value of
16 plan assets in the Pension Trust has grown from $6.6 billion at year-end
17 1987 to $14.6 billion at year-end 1999 and the computed surplus under
18 FAS 87 has grown to $5.8 billion.

19 So the surplus arose when new measurement rules (FAS 87) were
20 adopted and has grown since then as a result of higher than actuarially
21 expected ("stellar" in Mr. Carver's parlance) returns on Pension Trust

investments. [Carver, p. 122, line 14; see also Attachment 1 to Mr. Larkin's testimony]

Q. IS ANY OF THIS MONEY RECORDED ON QWEST'S BOOKS?

A. No. The plan assets (including the surplus) belong to the Pension Trust and are recorded on the Pension Trust's books, not Qwest's books.

Q. WHO BENEFITS FROM THE SURPLUS?

A. Ratepayer, investors, current employees and retirees all benefit from the surplus. As the sole beneficiaries of the pension plan, retirees and current employees benefit from the surplus because it provides strong assurance that their pensions will remain fully funded. Investors benefit from the surplus because it prolongs the time before they will have to begin funding the pension plan and because some of the surplus can be used to pay health care benefits of current retirees. Ratepayers benefit from the surplus because it is one of the variables used in the calculation of pension expense credits recorded on Qwest's books (Pension Credits) that reduce cost of service.

Q. THEN WHAT IS THE PENSION ASSET?

A. The Pension Asset is a balance recorded on Qwest's balance sheet.

Q. WHAT CAUSES THE PENSION ASSET ON QWEST'S BOOKS?

A. The Pension Asset has been created by the recording of Pension Credits on Qwest's books. Under FAS 87 accounting rules, pension expense is computed using a five factor formula that takes into account 1) service cost, 2) interest cost, 3) expected return on plan assets, 4) amortization of transition asset and 5) amortization of prior service cost. The first, second and fifth items typically generate positive expenses (charges). Because of the surplus in the Pension Trust, the computation of the third item (expected return on plan assets) and the fourth item (amortization of transition asset) generate negative expenses (credits). The sum of these five items has, for all but two years since Qwest's adoption of FAS 87 in 1987, generated a net negative expense (Pension Credit). The Pension Credit is an accrued negative expense on Qwest's books (not the Pension Trust's books).

Qwest cannot legally receive money from the Pension Trust to fund this negative pension expense accrual. Consequently, Qwest must charge this negative pension expense to a Pension Asset. So the Pension Asset is the accumulation of negative pension expense (Pension Credits) recorded in prior periods on Qwest's books.

Q. WHO BENEFITS FROM PENSION CREDITS?

A. Ratepayers, and to a small degree, investors benefit from Pension Credits. Ratepayers benefit from Pension Credits because they reduce cost of service and, therefore, put downward pressure on regulated rates. For instance, in the current test year, the Pension Credit puts downward pressure on revenue requirement by about $20 million. Investors benefit to a small degree from the Pension Credit because it increases reported earnings, but not cash flow.

Q. HAVE RATEPAYERS BENEFITED FROM ALL OF THE PENSION CREDITS RECORDED ON THE COMPANY'S BOOKS?

A. Yes. As I explained in my testimony concerning incentive compensation, ratepayers always benefit from decreases in costs reflected in regulated results of operations under cost of service regulation. Pension Credits are negative costs that reduce revenue requirement. Because every financial period is a test period (regardless of whether it warrants a case before the Commission), every dollar recorded as Pension Credit has a direct effect on revenue requirement. If revenue requirement changes enough, a rate case and a rates change will be warranted. But whether or not a rate case occurs, and regardless of the outcome of the case, ratepayers always benefit from the revenue requirement dampening effect of Pension Credits.

1 Mr. Carver observes that regulatory agencies are often reluctant to
2 commit the required resources to pursue and process formal earnings
3 complaint cases. [Carver, p. 132, lines 2 through 6] My experience
4 suggests that utilities are also reluctant to file a case unless the outcome
5 is likely to involve a significant change in rates. This reluctance to fully
6 litigate a case unless the financial stakes are substantial does not
7 diminish the benefit to utilities of any particular factor that increases
8 revenue requirement nor the benefit to ratepayers of any factor (such as a
9 pension credit) that decreases revenue requirement. It simply means that
10 all the factors that make up revenue requirement, considered in
11 aggregate, may not warrant a case.

12

13 **Q. RUCO IMPLIES THAT THE PENSION ASSET IS "THE NET AMOUNT**
14 **OF THE COMPANY'S PENSION OVER-FUNDING...." [LARKIN, P. 29,**
15 **LINE 18] IS THIS CORRECT?**

16 A. No. The surplus in the Pension Trust could be described (albeit
17 inaccurately) as the "net amount of pension over-funding". However, it is
18 not a correct description of the Pension Asset. The Pension Asset is the
19 accumulation on Qwest's books of Pension Credits and pension expense
20 debits over the years since Qwest's adoption FAS 87. Beginning on page
21 117, line 3, Mr. Carver's testimony also explains the accounting that
22 creates the Pension Asset and on page 118, chronicles the Pension

Credits and debits that have resulted in the Pension Asset on Qwest's books.

Q. WHAT IS THE SOURCE OF FUNDING FOR THE PENSION ASSET?

A. One of the fundamental accounting concepts that first year accounting students learn is that all assets on a balance sheet must be funded by liabilities or equity. Because Qwest cannot withdraw funding money from the Pension Trust for negative expense and must, instead, debit the Pension Asset, the source of funding for the Pension Asset is Qwest's investors who provide the money to fund debt and equity on Qwest's books.

Q. MR. LARKIN CLAIMS THE PENSION ASSET SHOULD BE REMOVED FROM RATE BASE BECAUSE THE COMPANY HAS NOT CLEARLY DEMONSTRATED THAT THE PENSION ASSET HAS BEEN FUNDED BY SHAREHOLDERS. IS HE CORRECT?

A. No. The accounting that shows the Pension Asset is funded by investors is rudimentary and clear. The source of funding for the Pension Asset is the debt and equity on the Company's books. It follows that under the same ratemaking standards that apply to the other major balances in the Company's Arizona rate base, the Company has fully met its obligation to demonstrate that investors have funded the Pension Asset.

In contrast, Mr. Larkin claims that the sources of the funding for the Pension Asset are:

> (1) the switch to accrual accounting when Statement of Financial Accounting Standards 87 (FAS 87) was adopted by the Company; (2) ratepayer payments to the Company for amounts of pension expense that were reflected in rates; and (3) earnings on the pension trust assets. . [Larkin, p. 30, line 10 to p. 31, line 2.]

None of these assertions is correct. The adoption of FAS 87 was not a financial transaction. So it could not be a source of funding. Instead, the adoption of FAS 87 was a change in accounting principle that made it possible for the Company to begin accruing the Pension Credits that gave rise to the Pension Asset.

Ratepayers' payments for services are clearly a source of positive cash flow. But they are not a source of funding. No sound accounting theory supports the contention that payments for services are contributions of capital to a privately held corporation.

Earnings on assets in the Pension Trust increase its balance. Increases in the Pension Trust balance increase the expected return on plan assets used in the calculation of pension expense. Increased expected return on plan assets reduces pension expense (in Qwest's case to a negative number). Accruing negative pension expense causes the accrual of the Pension Asset. However, the mere recording of these accruals provides no funding.

By law, Qwest cannot withdraw money from the Pension Trust for reimbursement of the Pension Credits recorded on its books. So Qwest must record negative pension expense under FAS 87 accounting rules, but can get no money from the Pension Trust to fund the negative expense. Without any other source for funding the asset, it falls to Qwest's investors to supply the capital for funding the Pension Asset. Contrary to Mr. Larkin's assertion, the earnings on the trust fund assets do not provide a source of funding for the Pension Asset because the law prevents Qwest from getting access to them for that purpose.

Q. WHY DOES STAFF BELIEVE THE PENSION ASSET SHOULD BE REMOVED FROM RATE BASE?

A. As I understand it, Mr. Carver's opinion is as follows:

- The Company improperly relies on its balance sheet accounting records for purposes of determining the amount that is includable in rate base. [Carver, p. 120, lines 18 and 19; p. 121, lines 5 through 14, p. 129, lines 16 through 19]
- In order to allow the Pension Asset in ratebase, the Company bears a burden of demonstrating that cumulative Pension Credits (the negative pension expense) of at least $62.2 million (intrastate) have been flowed through to its ratepayers. [Carver p. 119, lines 22 through 24; p. 120, line 25; p. 122, lines 17 through 20; p. 127, lines 15 through 17]
- The Company has not made this demonstration. [Carver, p. 120, lines 20 through 23; p. 121, lines 15 through 19; p. 128, lines 6 through 8, p. 128, lines 14 through 16]
- The Company can not make this demonstration because it is not possible to make this demonstration. [Carver, p. 120, lines 4 through 6;

p. 121, lines 15 through 19; p. 122, lines 20 and 21; p. 123, lines 17 and 18]

Q. DO YOU AGREE WITH MR. CARVER'S OPINION?

A. No. Mr. Carver has departed from sound ratemaking principles and invented his own special rule for deciding whether Pension Asset should be included in ratebase. By his own admission, it is not possible to satisfy his rule.

Q. WHY DO YOU SAY MR. CARVER HAS DEPARTED FROM SOUND RATE MAKING PRINCIPLES?

The primary components that must be considered for inclusion in rate base are:

1. Working Capital
2. Plant in service
3. Accumulated depreciation
4. Accumulated deferred taxes
5. Pension Asset

Of these five items, the last three are created by expense accruals: depreciation expense accruals create Accumulated Depreciation; deferred tax expense accruals create Accumulated Deferred Taxes, and negative pension expense accruals create the Pension Asset.

As Mr. Carver explains, under widely accepted rate making principles, a cost (which includes accrued expenses) is presumed to be covered by

existing rates, regardless of whether the cost of service study underlying those rates included a specific allowance for that unique cost. Were it otherwise, "the result could entail an endless reconciliation process comparing each element of actual costs during the rate effective period with the cost of service details underlying the preceding rate case order." [Carver, p. 132, lines 7 through 24] In fact, the rule against retro-active ratemaking is intended to prevent just such an "endless reconciliation process" (like the one Mr. Carver suggests must be performed to allow inclusion of Pension Asset in ratebase).

Under this widely accepted ratemaking principle, the balances on a utility's balance sheet that were created by accruals (Accumulated Depreciation, Accumulated Deferred Taxes, and Pension Asset) are treated as having been recovered or provided in rates whether or not they actually were.

> When rate base is constructed, the original cost of the assets is reduced by the accumulated provisions for depreciation. These accumulated provisions represent the prior years allocations [(accruals)] of depreciation for which the utility has had the opportunity to recover through rates but which recovery is not assured. [Principles of Public Utility Rates, Bonbright, Danielson and Kamerschen, (1988) p. 271, emphasis added]

Because this general principle is, and has long been accepted in Arizona, when the Commission reviews the ratebase in this proceeding, it will not require Staff and RUCO to engage in any reconciliation process to determine whether, and to what extent, the Company actually recovered in rates in prior years the Accumulated Depreciation and Accumulated

1 Deferred Taxes on Qwest's books. Instead, the parties, (including Staff)
2 will presume that the Company has recovered all Accumulated
3 Depreciation and all Accumulated Deferred Taxes on its books.

4 Regarding the Pension Asset, Mr. Carver's opinion departs from the
5 widely this accepted presumption. He claims that it has "limited
6 application" [Carver, p. 123, lines 3 through 7] and argues that the
7 Pension Asset can be included in ratebase only if the Company meets a
8 burden of a reconciliation process that shows that the Pension Credits
9 recorded on the books were flowed through to ratepayers in rates. He
10 also believes the Company cannot and could never meet that burden.

11

12 **Q. WHY DO YOU SAY MR. CARVER HAS INVENTED HIS OWN**
13 **STANDARD?**

14 A. Mr. Carver's testimony is careful to couch his advocacy concerning the
15 reconciliation requirement as his opinion. Mr. Carver's opinion—that the
16 Company bears a burden of demonstrating through a reconciliation that
17 cumulative Pension Credits (the negative pension expense) have been
18 flowed through to its ratepayers—is not a generally accepted ratemaking
19 principle. If it were, then the other elements of ratebase that are created
20 by expense accruals (Accumulated Depreciation and Accumulated
21 Deferred taxes) would also be subject to the same burden that Mr. Carver
22 would impose on the Pension Asset. In fact, his position directly violates

widely accepted ratemaking standards by contravening the rule against retroactive ratemaking.

Mr. Carver asserts that the widely accepted presumption that accrued expenses have been recovered or flowed through in rates does not extend to Pension Asset. [Carver, p. 132, line 24 through p. 133, line 2] However, he fails to offer any sound reason why Pension Asset should not be subject to the same ratemaking principles that govern the other elements of ratebase.

Q. MR. CARVER CLAIMS THAT, "THE QUESTION OF COST RECOVERY WITH REGARD TO NEGATIVE PENSION EXPENSE HAS A SUBSTANTIAL HISTORICAL CONTEXT WHICH, IF IGNORED, COULD LEAD TO INAPPROPRIATE CONCLUSIONS." [CARVER, P. 121, LINES 19 AND 20] DOESN'T THIS "SUBSTANTIAL HISTORICAL CONTEXT" JUSTIFY HIS DEPARTURE FROM WIDELY ACCEPTED RATEMAKING PRINCIPLES?

A. No. Mr. Carver recites the history of pension plan funding prior to and after the adoption of FAS 87 and observes that "the plan assets [in the Pension Trust] have accumulated over a long period of time, not just the last few years." [Carver, p. 122, lines 8 and 9] He also points out, correctly, that the high returns the Pension Trust has earned have "contributed to the negative pension expense being recorded by the

Company in accordance with FAS87, since 1987." [Carver, p. 122, lines 14 through 16] However, he offers no explanation about why he believes these factors justify a departure from widely accepted ratemaking principles and adoption, instead, of his proposed standard.

Accumulated depreciation and Accumulated deferred taxes also have a "substantial historical context." Like the funding of the Pension Trust and accrual of the Pension Asset, both Accumulated Depreciation and Accumulated Deferred Taxes have been created over long periods of time. Were the Commission to apply to them the same burden of reconciliation that Mr. Carver proposes for the Pension Asset, the reconciliation would, under Mr. Carver's interpretation of his own rule, extend back in time to the Company's first investment in Arizona. So a "substantial historical context" does not differentiate the Pension Asset from the other accrual-created balances on the Company's books and does not, in any event, justify a departure from widely accepted ratemaking standards.

Q. MR. CARVER ASSERTS THAT "IN SPITE OF THE REALITIES OF THE RATEMAKING PROCESS, THE COMPANY HAS BASICALLY RELIED ON AN 'AS RECORDED' COST RECOVERY THEORY...." [CARVER, P. 133, LINES 10 AND 11] HOW DO YOU RESPOND?

This assertion is curious. The Company relies on the "as recorded" cost recovery theory because of the realities of the ratemaking process, not in spite of them. Apparently, Mr. Carver seeks to create a separate and different reality for Pension Asset from the ratemaking reality that applies to the other elements of ratebase.

In the reality Mr. Carver seeks to create, he establishes a rule that, by his own admission, the Company can never satisfy. He proposes a reconciliation process to quantify the accumulated net pension recoveries from, or benefits provided to ratepayers. He complicates this process with his own set of conditions.

> First, I do not believe that it is possible to accurately quantify the accumulated net pension recoveries from or benefits provided to ratepayers. In order to prepare such a calculation, I believe that it would be necessary to reconcile the amount of actual pension costs recovered from ratepayers with the amounts actually contributed to the pension fund since the establishment of the pension plan. [Carver, p. 120, lines 4 through 9]

So under Mr. Carver's rule, the reconciliation of recorded expense to recovery and flow through must go back to the beginning of the pension fund and reconcile all of the rate orders and recorded expenses since then. He also requires that settlements of rate cases be ignored.

> In assessing the amount of pension credits flowed through to ratepayers, it is imperative that only those orders which specifically address the various components of cost of service be considered. [Carver, p. 126, lines 1 through 3]

By proposing a rule that requires a reconciliation back to the beginning of the pension plan, Mr. Carver has invented a "Catch 22" type of rule—one that, as he readily acknowledges, can never be satisfied.

Q. WHY DO YOU SAY MR. CARVER'S PROPOSED STANDARD FOR INCLUDING PENSION ASSET IN RATE BASE VIOLATES THE RULE AGAINST RETROACTIVE RATEMAKING?

A. Mr. Carver testifies:

> It is generally recognized that to allow utilities to collect additional funds from ratepayers in the future simply because expenses were incurred which had not been specifically provided for in the determination of the existing base rates is considered retroactive ratemaking. While past expenses are frequently employed in quantifying or developing the prospective cost of service on which overall rates are based, it is improper to establish future rates at levels intentionally designed to recover past losses or under-recoveries due to historical imbalances in the matching of rates and actual expenses. [Carver, p. 133, lines 3 through 9]

Mr. Carver's Pension Asset proposal would do exactly what he says is improper retroactive ratemaking. His reconciliation is a matching of recovery provided by prior rates with actual expenses accrued and capitalized on Qwest's balance sheet. To the extent recovery of negative expense by ratepayers was less than the negative expense accrued, he would recognize only the lesser amount. Hence, he would establish future rates at levels intentionally designed to remedy ratepayers' alleged

past under-recoveries of pension credits by reducing the capitalized balance to the level of actual recoveries.

His proposal violates the rule against retroactive ratemaking in the same way the rule would be violated if Qwest were allowed to reduce Accumulated Depreciation because the amount of depreciation included in rates was less than the amount of depreciation it recorded on its books in prior rate effective periods. The only difference between Mr. Carver's proposed retroactive ratemaking treatment of Pension Asset and the retroactive ratemaking treatment of Accumulated Depreciation I have just described is that his case deals with credits to pension expense and mine deals with debits to depreciation expense.

Q. DO YOU SEE ANY INCONSISTENCIES IN MR. CARVER'S ARGUMENTS AND HIS CONCLUSION THAT RATEPAYERS HAVE NOT RECEIVED SUBSTANTIAL BENEFITS FROM THE RECORDING OF PENSION CREDITS? [CARVER, P. 123, LINE 10]

A. Yes. On the same page that Mr. Carver asserts ratepayers have not received substantial benefits [Carver, p. 123, line 10], he also asserts that it is not possible to accurately quantify the benefits ratepayers have received. [Carver, p. 123, lines 17 and 18] With regard to cases in which revenue requirement was settled, Mr. Carver also admits, "I am unable to conclude what amount of any pension credits were embedded within the

test years used in either of these proceedings or whether any credits were partially or fully flowed through to benefit ratepayers...." [Carver, p. 126, lines 26 through 30]

If it is not possible to accurately quantify the benefits provided to ratepayers, then any conclusion that ratepayers have received no substantial benefits necessarily must be questioned.

If it is not possible for the author of a proposed standard to determine whether or not it has been met, then that standard should be questioned. The fact that Mr. Carver offers two different calculations of the benefits ratepayers have received [Carver Appendix SCC-1 and Appendix SCC-2], and that these two calculations differ by more than $100 million, suggests and illustrates why the reconciliation standard that he advocates is not workable or reasonable.

Q. BOTH STAFF AND RUCO CITE THE COMMISSION'S ORDER IN QWEST'S LAST RATE CASE IN SUPPORT OF THEIR POSITION. [CARVER, P. 133, LINE 16 THROUGH P. 134, LINE 14; LARKIN, P. 29, LINES 15 THROUGH 23] WHY HAS QWEST TAKEN A POSITION DIFFERENT FROM THE COMMISSION'S PRIOR ORDER?

A. Qwest respectfully disagrees with the conclusion the Commission reached in the prior order. As my testimony makes clear, we believe the Commission should determine the amount of Pension Asset by applying

1 the widely accepted standard for determining the elements of ratebase2
2 instead of Mr. Carver's proposed standard.
3
4 **Q. HOW DO YOU RECOMMEND THE COMMISSION TREAT THE**
5 **PENSION ASSET FOR RATEMAKING PURPOSES?**
6 A. I recommend that the Commission reject the imposition of Mr. Carver's
7 proposed standards for inclusion of Pension Asset in ratebase and,
8 instead, employ the widely accepted standard of establishing ratebase
9 that relies on balances as recorded. I recommend the Commission not
10 deny investors their right to recover a return on their capital invested in the
11 Pension Asset. Therefore, I recommend the Commission make no
12 adjustment to remove the Pension Asset from rate base.
13 If the Commission chooses to deny investors a return on the Pension
14 Asset by imposing a reconciliation burden that cannot be met, then the
15 Commission should 1) ensure that no further Pension Asset is created by
16 ceasing any further recognition of negative pension expense in regulated
17 results of operations and cost of service and 2) return the Pension Asset
18 to investors by amortizing it into cost of service over an appropriate
19 amortization period.
20 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

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[2] In an Order adopted December 17, 1987, in Docket 86-497, the FCC ruled, at paragraph 43 regarding items to be included in rate base, "We will allow deferred charges related to...pension fund payments in

1 A. Yes.

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excess of expenses recognized for regulatory purposes."

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC. A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES	)	DOCKET NO. T-01051B-99-0105

EXHIBITS OF

PHILIP E. GRATE

QWEST CORPORATION

August 21, 2000

PHILIP E. GRATE: CURRICULUM VITAE

BUSINESS ADDRESS

U S WEST Communications, Inc.
1600 Bell Plaza, Room 3008
Seattle, Washington 98191

(206) 345-6224
(206) 346-9001
pgrate@uswest.com

LICENSURE

Mr. Grate is a licensed Certified Public Accountant in Washington and is admitted to the Washington State Bar to practice law.

EDUCATION

Mr. Grate earned a Bachelor of Science Degree in Business Administration with a concentration in Accounting from Indiana University, Bloomington. Mr. Grate also earned a Juris Doctorate from Indiana University, Bloomington.

EMPLOYMENT

From 1982 to 1984, Mr. Grate was a senior tax consultant for Touche Ross, a Certified Public Accounting firm that subsequently became part of Deloitte & Touche.

In 1984, Mr. Grate became a manager of tax research for Pacific Northwest Bell Telephone Company, Inc. In 1987, Mr. Grate became the Tax Attorney for Pacific Northwest Bell, Northwestern Bell, and Mountain Bell, the predecessors of U S WEST Communications, Inc. Mr. Grate's staff and he were responsible for advising U S WEST Communications, Inc. on matters related to tax planning and compliance and for representing the company before regulatory commissions on tax related matters. In 1990, Mr. Grate accepted a position as Director of Accounting Standards for U S WEST Communications, Inc. His staff and he were responsible for U S WEST Communication's compliance with Generally Accepted Accounting Principles (GAAP) and the accounting rules promulgated by the Federal Communications Commission (FCC) including Parts 32 and 64 of Title 47 of the Code of Federal Regulations. In 1995, Mr. Grate became Director – State Finance, where he serves as the company's representative to state regulatory agencies concerning accounting and finance matters and as an expert witness in proceedings before state regulatory agencies.

TESTIMONIES

Mr. Grate has testified on the following topics in the following proceedings:

Regulatory Accounting

Iowa Department of Commerce - Utility Division in Docket No. RPU-93-9

Cost of Service Revenue Requirement

Utah Public Service Commission Docket No. 95-049-05
Utah Public Service Commission Docket No. 97-049-08
Washington Public Service Commission Docket No. UT-970766

Depreciation

Utah Public Service Commission Docket No. 95-049-22

Federal Income Taxation in Cost of Service

Utah Public Service Commission Docket No. 88-049-07

Merger of U S WEST, Inc. and Qwest Communications International Inc.

Utah Public Service Commission Docket No. 99-049-05
Arizona Corporation Commission Docket No. T-01051B-99-0497

Sale of Telephone Exchanges

Idaho Public Utilities Commission Case Nos. USW T-99-25 and CTC T-99-2
Arizona Corporation Commission Docket No. T-01051B-99-0737

Arizona
Docket No. T-1051B-99-105
UTI 53-002

INTERVENOR: Arizona Corporation Commission Staff (Utilitech)

REQUEST NO: 002

Please identify each incentive, bonus and variable compensation arrangement in place for U S WEST, Inc. personnel in 1999 and provide the following information for each such arrangement:

1. Copies of plan documents describing all terms and conditions governing compensation amounts,

2. Common language description of each compensation plan (as provided to participants, if available),

3. Statement of each input amount used to calculate the actual amount of compensation earned by each participant in the arrangement in 1999, including but not limited to earnings and cash flow metrics, business goals/objectives, and individual or group achievement targets.

4. Calculations of compensation earned by each participant in each plan, using the input data from (c), above and plan document formulae from (a), above

5. Actual compensation under each plan for each officer level employee of U S West, Inc.

6. Total Compensation (all employees) under each plan by U S WEST, Inc. RC in 1999,

7. Allocable amounts from (f) within recorded Arizona intrastate expenses of USWC in 1999,

8. Allocable amounts from (f) within recorded Arizona intrastate expenses of USWC in December 1999, as included in the Company's annualized expenses for the test period.

RESPONSE:

1. There were five active incentive or bonus plans/arrangements in U S WEST Inc., during the 1999 test year.

1999 Annual Bonus Plan (ABP)
1999 Short-Term Incentive Plan (STIP)
1997 Long-Term Incentive Plan (LTIP)
1998 Long-Term Incentive Plan (LTIP)

Merit Award grants

Please refer to Confidential Attachment A which includes copies of the ABP business unit component plan documents for U S WEST, Inc. The corporate component of the ABP is the same as the 1999 STIP.

While there is not a specific plan document for the 1999 Short-Term Incentive Plan, please refer to response UTI 60-11 Confidential Attachment C for the plan as approved by the Human Resources Committee of the Board of Directors.

The 1997 and 1998 LTIPs were both active in 1999. However, these are three year plans and eligibility was determined the first year of the plan, 1997 and 1998 respectively. Please refer to response UTI 2-17 c - g, for information on the 1997 and 1998 LTIPs. Confidential Attachment F is the stock plan under which grants for the LTIP were made.

Merit Awards are approved on an individual basis. Please refer to UTI 60-11 #3 Confidential Attachment F for the form used to recommend employees for this incentive arrangement.

2. Individual business units handle the communication of the ABP to individual employees. No copies are available. Please see Attachment B for the employee orientation presentation on the Annual Bonus Program. Please refer to response UTI 53-3 #2 for information provided to I/T employees regarding the ABP.

STIP and LTIP awards are communicated individually with employees at the time of grant. Please refer to Confidential Attachment C (1999 folio) which contains plan information provided to employees participating in these plans.

Merit awards are granted on an individual basis and communicated verbally to the award recipient at the time of grant.

3. The 1999 Annual Bonus Program performance inputs were as follows:
   * Corporate Component (Same as STIP inputs listed below) 60%
   * Business Unit Component (See Confidential Attachment A) 40%

The STIP and the corporate component of the annual bonus program inputs were as follows:

* 60% Financial
  - Net Income (20%)
  - Cash Flow (20%)
  - Revenue (20%)
* 40% Service
  - Consumer CVA (10%)
  - SBG CVA (10%)
  - BGS CVA (10%)
  - Wholesale - Provisioning (5%)
  - Wholesale - Repair (5%)
* Total Target 100%

Please refer to UTI 2-17 Part E for information on inputs in the 1997 LTIP.

Please refer to UTI 2-17 Part F for information on inputs in the 1998 LTIP.

Merit awards are granted on an individual basis for special assignments or projects completed. There are no specific inputs for merit awards.

4. The calculations of compensation earned by each individual participant in each of the bonus or incentive plans is voluminous. Please contact Pamela Morrow, 303-672-1762, to arrange a mutually convenient time and place to review them. Provided below are the calculations used to compute compensation for each of the plans.

Confidential Attachment D provides the formula for the funding of the ABP program as well as the formulas used to determine individual bonus payouts. Please note that all payouts under the annual bonus program consider individual performance and are subject to management discretion.

At the beginning of the year, the target payout for participants in the 1999 STIP is communicated individually to each employee in the plan. This target amount is expressed as a percentage of salary. STIP is calculated by multiplying that target payout times the participant's salary times the corporate performance results (from the STIP inputs above). Please note that all payouts under the annual bonus program, regardless of target amount and corporate performance results, consider individual performance and are subject to management discretion.

Participants in the 1997 & 1998 LTIPs are provided Dividend Equivalent Units (DEUs) at the beginning of the plan year. The number of DEUs awarded to participants is communicated individually with each participant. Each of these plans has a three year performance period (12 Quarters) regarding the inputs in UTI 2-17 Parts E & F. The dividends awarded to stockholders over these 12 quarters are summed and the multiplied by the performance results and multiplied by the number of DEUs a participant holds.

Merit Awards are granted on an individual basis for special assignments or projects completed. Amount of award varies depending upon performance and is determined by the management team.

5. Please refer to Confidential Attachment E for officer level compensation of U S West, Inc.

6. Confidential Attachment H provides the total salary compensation of all employees by RC in 1999 in U S WEST, Inc.

7. Confidential Attachment G provides the Arizona intrastate allocable amount of U S WEST, Inc. salaries for the year 1999.

8. Please see Confidential Attachment G for the Arizona intrastate amount of U S WEST, Inc. salaries for the month of December 1999.

Confidential Attachments A through H are being provided pursuant to the terms of the Protective Agreement.

Janelle Johnson, Respondent for 1.- 4.
Human Resources Consultant
1801 California Street
Room 650
Denver, CO 80122

Gayle Williams, Respondent for 5.- 8.
Finance Analyst
1600 7th Avenue
Room 3004
Seattle, WA 98191

UTI 53-002
Attachment A
Redacted

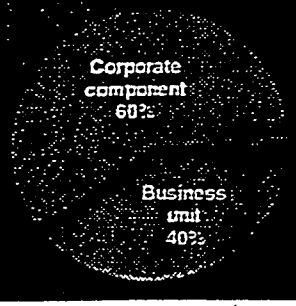
Will be provided pursuant to the terms of the protective agreement.

Employee Orientation Presentation

Introduction to Human Resources

ARIZONA
DOCKET NO. T-01051B-99-0105
UTI53- 002
ATTACHMENT: B

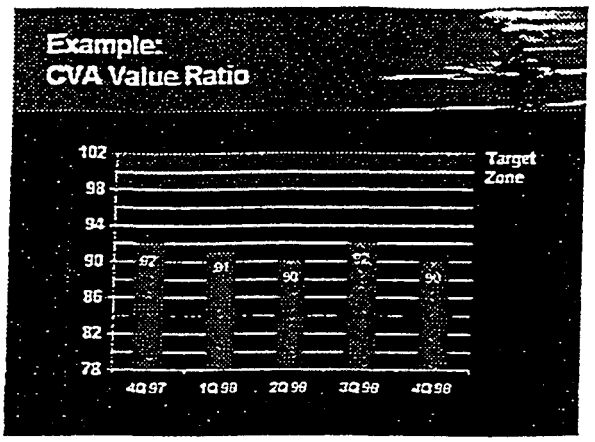
1999 annual bonus program



Customer Value Analysis

- Customer perception
- Rates 40 to 60 factors
- Affects annual bonus program

Introduction to Human Resources



1999 annual bonus opportunity range

SALARY GRADE	BONUS OPPORTUNITY RANGE
10, 306	10-40%
5, 305	8-30%
4, 304	6-18%
3, 303	5-15%
2, 302	5-15%
2A	4-10%
1B	4-10%
C3-C9	3-7%

O&T, Sales, IT and AT are on a different plan

UTI 53-002
Attachments C through F
Redacted

Will be provided pursuant to the terms of the protective agreement.

Arizona
Docket No. T-1051B-99-105
UTI 60-011

INTERVENOR: Arizona Corporation Commission Staff (Utilitech)

REQUEST NO: 011

Re: USWC responses to UTI 2-17 (Incentive Compensation). Please supplement the referenced response to include comparable information associated with each incentive compensation plan or arrangement that was active during the 1999 test year. [For reference purposes, the question, as updated, is reproduced below.]

1. A statement of the recorded costs of the plan/arrangement by month and by FCC Account.
2. Calendar year 1999 and 2000 actual recorded costs for each such plan, in a format comparable to the response to part (a), above.
3. A description of the plan/arrangement in the form approved by senior management and the Board of Directors.
4. A description of the plan/arrangement in the form presented to employees and other participants.
5. A statement of the 1999 objective measures of performance employed by the plan or ranges for same.
6. A statement of the comparable actual "achieved" levels of performance in relation to each objective for calendar 1999.
7. Also, please provide the pay-out matrix used to compare actual achievements with the target objectives.

RESPONSE:

1 & 2 Please see Confidential Attachments A and B for the calendar years 1999 and 5 months 2000 recorded incentive compensation expenses as booked to Total State Arizona by month and by FCC Account. Included in these attachments are a break out of the Annual Bonus Plan and Performance Bonus Plan from the 19C Management Team Awards. In addition, the IT-Career Structure Bonus Plan in 1999 has been added. In the year 2000 the IT-Career Structure Bonus Plan transfers to the affiliate.

Confidential Attachments A and B are being provided pursuant to the terms of the Protective Agreement.

3. There were eight active incentive bonus plans or arrangements in 1999:
   1) 1999 Annual Bonus Plan (ABP)
   2) 1999 Short-Term Incentive Plan (STIP)
   3) 1999 Performance Bonus Plan
   4) 1999 BRI Annual Bonus Program
   5) 1999 IT-Career Structure (IT-CS) Bonus Plan
   6) 1997 Long-Term Incentive Plan (LTIP)
   7) 1998 Long-Term Incentive Plan (LTIP)

8) Merit Awards

The corporate component of the Annual Bonus Plan is the same as the 1999 STIP as approved by the Human Resources Committee of the Board of Directors. Please see Confidential Attachment C for a description of the plan as presented to the Board.

Please see Confidential Attachment D for a description of the 1999 Performance Bonus Plan as presented to senior management.

Please see Confidential Attachment E for the Annual Bonus Plan for Business Resources Inc. (BRI) Occupational employees as presented in the contract between U S WEST BRI and the Communications Workers of America. This bonus plan is an extension of the Annual Bonus Plan for which BRI managers are eligible, therefore, for the remainder of this response, the BRI Annual Bonus Plan will be collapsed into the ABP.

Please refer to UTI 53-03 #1 Confidential Attachment A, for the 1999 IT-CS Bonus Plan as presented to senior management.

The 1997 and 1998 LTIP plans were included in the original response to UTI 2-17 and do not need updating.

Merit awards are approved on an individual basis. Please refer to Confidential Attachment F for the form used to recommend employees for this incentive arrangement.

4. Individual business units handle the communication of the ABP to individual employees. No copies are available. Please refer to response UTI 53-02 #2 Confidential Attachment B, for information provided at employee orientation regarding ABP. Please refer to response UTI 53-03 #2 Confidential Attachment B, for information provided to Information Technology employees regarding the ABP. Please refer to Confidential Attachment E for the BRI ABP as presented in the contract.

STIP is communicated individually with employees. Please refer to response UTI 53-02 Confidential Attachment C for information sent to Executives and Executive Directors regarding STIP.

Please see Confidential Attachment D and G for a description of the 1999 Performance Bonus Plan as communicated to employees.

Please refer to response UTI 53-03 #2 Confidential Attachment B, for information provided to employees regarding the 1999 IT-CS Bonus Plan.

The 1997 and 1998 LTIP plans were included in the original response to UTI 2-17 and do not need updating.

Merit awards are granted on an individual basis and communicated verbally to the award recipient at the time of grant.

5. The 1999 Annual Bonus Program performance measures were as follows:

* Corporate Component (same as STIP measures listed below) 60%.
* Business Unit Component (see Confidential Attachment H) 40%

1999 STIP performance measures were as follows:

* 60% Financial
  - Net Income (20%)
  - Cash Flow (20%)
  - Revenue (20%)
* 40% Service
  - Consumer CVA (10%)
  - SBG CVA (10%)
  - BGS CVA (10%)
  - Wholesale - Provisioning (5%)
  - Wholesale - Repair (5%)
* Total Target 100%

Please refer to Confidential Attachment I for the performance measures of the Performance Bonus Plan.

Please refer to response UTI 53-03 #3 Confidential Attachment A for the performance measures of the IT-CS Bonus Plan.

There is no update to the information provided in UTI 2-17 for the 1997 LTIP performance measurement.

There is only one performance measure for the 1998 LTIP. That measure is Total Revenue Increase Percentage.

Merit awards are granted on an individual basis for special assignments or projects completed. There are no performance measures for merit awards.

6. The results of the business unit component (for each unit) of the 1999 Annual Bonus Plan can be found in Attachment H. The results for the corporate component of the Annual Bonus Plan are the same as the 1999 STIP performance results and can be found in Confidential Attachment J. Overall, the results for the 1999 Annual Bonus Plan were 90.8% of the total targeted amount.

Please refer to Confidential Attachment J for 1999 STIP performance results.

Please refer to Confidential Attachment K for information regarding the achieved results under the 1999 Performance Bonus Plan. Payout was a minimum of 75% for second, third and fourths quarters.

The IT-CS Bonus Plan results as a percentage of target are as follows:

* Financials - 110.90%
* Service - 110.80%
* Deliverables - 100%
* Y2K - 150.00%

The 1997 LTIP was a three-year plan covering calendar years 1997 - 1999. Please find performance results in Confidential Attachment M.

The 1998 LTIP is a three-year plan covering calendar years 1998 - 2000. Due to the merger with Qwest and the consequent Change in Control, the 1998 LTIP was paid out at target in 2000.

Merit awards are granted on an individual basis for special assignments or projects completed. There are no global measures of achievement for merit awards.

7. Please refer to Confidential Attachment J for 1999 STIP payout matrix.

The payout matrix for the corporate component of ABP can be found in Confidential Attachment J (it is the same as the Matrix for the 1999 STIP). Please refer to UTI 60-14 #5 regarding payout matrices for the business unit component of the ABP.

Please refer to Confidential Attachment L for PBP payout matrix.

Please refer to Confidential Attachment N for IT-CS Bonus Plan payout matrix.

The payout matrix for the 1997 LTIP can be found in Confidential Attachment M.

The payout matrix for the 1998 LTIP is as follows:

Revenue	Payout
Greater than 7% Growth	150%
3% - 6% Growth	100%
2% Growth	50%
Below 2% Growth	0%

Merit awards are granted on an individual basis, and therefore no payout matrix exists.

Confidential Attachments A through N are being provided pursuant to the terms of the Protective Agreement.

Gayle Williams, Respondent
Finance Analyst
1600 7th Avenue
Room 3004
Seattle, WA 98191

Janelle Johnson, Respondent 3 - 7
Human Resources Consultant
1801 California Street
Room 650
Denver, CO 80122

UTI 60-011
Attachments A through N
Redacted

Will be provided pursuant to the terms of the protective agreement.

Arizona
Docket No. T-1051B-99-105
UTI 60-014

INTERVENOR: Arizona Corporation Commission Staff (Utilitech)

REQUEST NO: 014

Re: USWC responses to UTI 2-17 (Incentive Compensation). Please provide the following information with regard to the Business Unit component of the 1999 test year ABP incentive compensation plan. [Note: The format containing most of this information is presented in the confidential response to Staff/UTI 35-8 in the pending New Mexico rate proceeding.]

1. Please identify and describe each individual business unit.
2. For each individual business unit, please provide the performance target(s).
3. For each individual business unit, please provide the achieved result(s).
4. For each individual business unit, please provide the weighting factors used to derive the composite achieved results.
5. For each individual business unit, please provide the pay-out matrix.
6. For each individual business unit, please provide a copy of the plan documentation.
7. For each individual business unit, please provide copy of the information distributed to employees and other participates which discuss, describe and outline plan year terms, conditions and expectations.

RESPONSE:

USWC is responding to only Part 3 of this request for the business unit component of the 1999 ABP for the following Market Units because the charges they generated in Arizona were for services rendered to Arizona Public Policy, not for activities that supported their own state's business unit criteria:

Public Policy, Colorado, 03
Public Policy, Idaho, 08
Public Policy, Iowa, 05
Public Policy, Minnesota, 06
Public Policy, Montana, 09
Public Policy, Nebraska, 07
Public Policy, New Mexico, 04
Public Policy, North Dakota, OA
Public Policy, Oregon, OD
Public Policy, South Dakota, OB
Public Policy, Utah, OE
Public Policy, Washington, OF
Public Policy, Wyoming, OC

The expenses charged to Arizona regulated results of operations for the business unit component of the ABP of these 13 business units is included under the heading "Public Policy" in Confidential Attachment B to this response.

Expenses for the business unit component of the ABP for the following business units did not originate at USWC, but rather at affiliates of USWC. To the extent Arizona regulated results of operations incurred any charges during the 1999 test year for the business units components of the ABP for these affiliates, they would have been incurred through affiliate billings to USWC. With regard to these business unit components of the ABP, USWC is responding to Parts 1, 2, 4, 5, 6, and 7 of this request. With regard to Part 3 of this request, the amount of any charges to Arizona regulated results of operations for these business unit components will be provided as soon as it is available in the form of a supplemental response to this request if, and to the extent such information can be determined without a special study.

Corporate Development, T3 (U S West, Inc.)
Federal Services, B2 (U S Comm. Federal Services)
Flight, H6 (BRI, Inc.)
Long Distance, G1 (U S West Long Distance)
Malheur Home Telephone, V1
Operns.& Tech., Adv.Tech., K2 (U S Technologies, Inc.)
Public Policy, Federal Office, OH (U S West, Inc. & U S West Federal Relations)
Strategy, T2 (U S West, Inc.)
Trust Management, M4 (U S West, Inc.)
U S West Dex, Inc., X1
Wireless, D1 (U S West Wireless, LLC)

1. Each business unit is identified at the top of the plan document which can be found in Confidential Attachment A.

2. Please find the requested information in Confidential Attachment A.

3. Confidential Attachment B provides Arizona's estimated Business Unit portion of the Annual Bonus Plan by individual business unit for the year 1999. The estimated Business Unit portion was allocated to the individual business units based on percentages of responsibility codes charged for the Annual Bonus Plan in 1999. They should be considered estimates.

4. Please find the requested information in Confidential Attachment A.

5. The requested documents are voluminous. The information is available for review on-site in Denver Colorado. Please contact Pamela Morrow at 303-672-1762 to make arrangements.

6. Please find the requested information in Confidential Attachment A.

7. Individual business units handle the communication of the ABP to individual employees. No copies are available. Please refer to response UTI 53-02 Confidential Attachment B for information provided at employee orientation regarding ABP. Please refer to response UTI53-03 #2 Confidential

Attachment B, for information provided to Information Technology employees regarding the ABP.

Confidential Attachments A and B are being provided pursuant to the terms of the Protective Agreement.

Janelle Johnson, Respondent 1,2,4 - 7
Human Resources Consultant
1801 California Street
Denver, CO 80122

Gayle Williams, Respondent for 3
Finance Analyst
1600 7th Avenue
Room 3004
Seattle, WA 98191

UTI 60-014
Attachment B
Redacted

Will be provided pursuant to the terms of the protective agreement.

Arizona
Docket No. T-1051B-99-105
UTI 53-003

INTERVENOR: Arizona Corporation Commission Staff (Utilitech)

REQUEST NO: 003

Please identify each incentive, bonus and variable compensation arrangement in place for U S West Information Technologies personnel in 1999 and provide the following information for each such arrangement:

1. Copies of plan documents describing all terms and conditions governing compensation amounts,
2. Common language description of each compensation plan (as provided to participants, if available),
3. Statement of each input amount used to calculate the actual amount of compensation earned by each participant in the arrangement in 1999, including but not limited to earnings and cash flow metrics, business goals/objectives, and individual or group achievement targets.
4. Calculations of compensation earned by each participant in each plan, using the input data from (c), above and plan document formulae from (a), above
5. Total Compensation (all employees) under each plan for IT in 1999,
6. Allocable amounts from (e) within recorded Arizona intrastate expenses of USWC in 1999,
7. Allocable amounts from (e) within recorded Arizona intrastate expenses of USWC in December 1999, as included in the Company's annualized expenses for the test period.

RESPONSE:

1. Please find copies of plan documents for the two incentive plans active in Information Technologies for test year 1999 in Confidential Attachment A. Information Technology employees are eligible for either the Annual Bonus Program or the IT-Career Structure (IT-CS) Bonus Plan.

Employees at the officer level in I/T are covered under the 1999 Short Term Incentive Plan (STIP) and 1997 and 1998 Long Term Incentive Plan (LTIP). Information on the 1997 and 1998 LTIP plans was provided in Confidential Attachment C of UTI 2-017. Please refer to UTI 53-02 #1 - #4 for information regarding STIP.

2. Please find the descriptions of the Annual Bonus Program and the IT-CS Bonus Plan in place for I/T employees in Confidential Attachment A. These descriptions were available to employees via U S WEST's internal website.

3. Please refer to Confidential Attachment A which includes the inputs for the business unit component of the IT-CS Bonus Plan and Annual Bonus Program. The inputs to the corporate component of the Annual Bonus Plan can be found in response UTI 53-02 #3.

Individual objectives required under the IT-CS bonus plan are recorded in individual employee performance plans or files and not held centrally.

4. Please refer to response UTI.53-002 #4 Confidential Attachment D, for information regarding the calculation of individual employee payouts under the Annual Bonus Program.

Information on how the IT-CS Bonus Plan is calculated can found in Confidential Attachment A.

5. Please see Confidential Attachment B for the estimated total compensation amounts for U S West Information Technologies, Inc. employees in 1999.

6. Please see Confidential Attachment B for the estimated amount allocated to Arizona intrastate of USWC in 1999.

7. Please see Confidential Attachment B for the estimated amount allocated to Arizona intrastate of USWC in December 1999.

Confidential Attachments A and B are being provided pursuant to the terms of the Protective Agreement.

Janelle Johnson, Respondent for 1. - 4.
Human Resources Consultant
1801 California Street
Room 650
Denver, CO 80122

Gayle Williams, Respondent for 5, 6, and 7
Finance Analyst
1600 7th Avenue
Room 3004
Seattle, WA 98191

UTI 53-003
Attachment A
Redacted

Will be provided pursuant to the terms of the protective agreement.

UTI 53-003
Attachment B
Redacted

Will be provided pursuant to the terms of the protective agreement.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	**DOCKET NO. T-1051B-99-105**
STATE OF WASHINGTON	)	**AFFIDAVIT OF PHILIP E. GRATE**
COUNTY OF KING	)	**ss**

Philip E. Grate, of lawful age being first duly sworn, depose and states:

1. My name is Philip E. Grate. I am State Finance Director of Qwest Corporation in Seattle, Washington. I have caused to be filed written testimony and exhibits in support of USWC in Docket No. T-01051B-99-0105

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Philip E. Grate

SUBSCRIBED AND SWORN to before me this 17th day of August, 2000.

ANGIE LEIFER
NOTARY PUBLIC
COMMISSION EXPIRES 8-08-02
STATE OF WASHINGTON

Notary Public residing at
Seattle, Washington.

My Commission Expires: 8/8/02

BEFORE THE ARIZONA CORPORATION COMMISSION

EXHIBIT
Q-24
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	DOCKET NO. T-01051B-99-0105

REBUTTAL TESTIMONY OF CARL INOUYE

ON BEHALF OF

QWEST CORPORATION

AUGUST 21, 2000

REBUTTAL TESTIMONY OF CARL INOUYE

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IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Carl Inouye and my business address is 1600 7th Avenue, Seattle, Washington, 98191.

Q. PLEASE STATE YOUR POSITION AND RESPONSIBILITIES WITH QWEST CORPORATION ("QWEST" OR "COMPANY").

A. I am employed by Qwest as Lead Director Financial Advocacy. In that capacity I am responsible for the presentation of financial matters before the state regulatory commissions that regulate Qwest.

Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

A. Exhibit CTI-1, attached to this testimony, describes my education and professional experience.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is respond to the testimony of Staff witness Shooshan as it relates to competitive zones and in the alternative a price regulation plan for Qwest's Arizona intrastate operations.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. Qwest generally supports moving away from traditional rate of return (ROR) regulation toward price regulation and, ultimately, to reliance on competitive forces to determine price and service offerings. The Company complements the Staff for its forward thinking. The mixing of competitive entry with traditional ROR regulation is a mixture of polar opposites that has produced a strange brew of regulation that favors competitors. While Qwest is concerned with the specific conditions of Mr. Shooshan's alternative, its basic structure is useful for describing a price regulation plan that Qwest would favor.

The price regulation plan proposed by Mr. Shooshan does not provide Qwest with any new pricing flexibility for its existing services. In fact, it appears to take away existing pricing flexibility and impose rate reductions upon Qwest that would not otherwise occur. Nor, does the plan offer any specifics as to how future pricing flexibility would be granted, other than through the existing Commission process. In sum, there is little movement toward equalizing how the Commission controls Qwest's prices versus how it controls that of Qwest's competitors.

In response to Mr. Shooshan, I propose a price regulation plan that Qwest would favor. The Qwest proposal follows Mr. Shooshan's basic plan structure. The Qwest plan involves two baskets of services, each with pricing rules. The competitive zone concept described in Mr. Teitzel's direct testimony is incorporated into the Qwest plan as the means to move services from the basic/essential basket to the competitive basket. The Qwest plan is put forward for the Commission's consideration.

RESPONSE TO MR. SHOOSHAN'S PROPOSED PLAN

Q. DO YOU AGREE THAT PRICE REGULATION IS GENERALLY MORE BENEFICIAL AS COMPARED TO THE CURRENT FORM OF REGULATION?

A. Yes, I agree with Mr. Shooshan that price regulation avoids rate proceedings, such as this docket, in which considerable time and resources of the Company and the Commission are spent reviewing financial records and litigating the archaic intricacies of ratemaking. I also agree that price regulation can produce benefits to customers in the form of increased investment and price protections.

Q. DO YOU AGREE THAT THE INCENTIVE TO INVEST CAPITAL IS IMPROVED UNDER MR. SHOOSHAN'S PROPOSED PRICE REGULATION?

A. No. While I generally agree that the incentive to invest can be greater under price regulation, I do not agree that the price regulation plan proposed by Mr. Shooshan will increase the incentive to invest. The reason is because Mr. Shooshan's plan does not afford Qwest the same opportunity to operate as its unregulated competitors. Competitors have the freedom in head to head competition with Qwest to determine their prices without regulatory intervention. For Qwest, however, the same regulatory price controls that currently exist are maintained in Mr.

Shooshan's price regulation plan with little prospect for improvement during the plan's 5-year term for increases pricing flexibility.[1]

With no change in pricing flexibility, Mr. Shooshan's plan does little to bring about the benefits generally attributed to price regulation.[2]

Q. IS ONE OF THE PURPOSES OF PRICE REGULATION TO PROVIDE GREATER PRICING FLEXIBILITY?

A. Yes, it is. Mr. Shooshan testifies that "[P]rice regulation directly protects consumers and provides the incumbent with a greater flexibility to respond to competitors." (Testimony of Shooshan, p. 7, L.10-11) However, the price regulation plan proposed by Mr. Shooshan does not provide Qwest with any greater pricing flexibility for existing services.

Q. PLEASE EXPLAIN HOW EXISTING REGULATORY PRICE CONTROLS ARE MAINTAINED, IF NOT INCREASED, IN MR. SHOOSHAN'S PROPOSED PLAN.

A. Turning to Mr. Shooshan's Attachment 1, Page 1, Basket 3 contains services that "streamlined" pricing flexibility has already been granted to Qwest. In other words, the creation of Basket 3 does not in any way

[1] It appears to Qwest that Mr. Shooshan's proposed plan would actually diminish pricing flexibility for existing services, an effect that is discussed further below. The only new price flexibility appears to be for new retail services and bundled packages.

[2] Given the infrequency of general rate cases in Arizona, the last rate case being 5 years ago which happens to coincide with the price regulation plan, and the proposed 20% annual reduction of access charges, "hard caps" on Basket 1 services, and the 5% annual "consumer dividend", Mr. Shooshan's proposed plan is heavily stacked. Normal regulatory lag with the option to file a rate case at any time before 5 years pass would better serve Qwest financially.

provide greater price flexibility beyond what the Commission has already granted Qwest.

Qwest has previously been granted pricing flexibility for special access/private line services. Nevertheless, under Mr. Shooshan's proposal, special access/private line appears in Basket 2, where there is no mention of the existing pricing flexibility.3

Qwest has been granted "streamlined" pricing by the Commission for several existing "service packages," which under Mr. Shooshan's proposal are placed in Basket 1 where no pricing flexibility would exist.

Finally, all the services in Basket 1 are price capped for 5 years. Under ROR regulation, the same services are "price capped" in the years between rate cases. Given the frequency of Arizona rate cases, Mr. Shooshan's proposal is no change from existing regulation.

Q. WHY IS THERE LITTLE PROPECT FOR IMPROVEMENT FOR INCREASED PRICE FLEXIBILITY?

A. Mr. Shooshan states that pricing flexibility could be achieved by moving a service from Basket 1 "Basic/Essential Services" to Basket 3 "Advanced/Competitive/Nonessential Services" upon a showing that the requirements of A.C.C. R14-2-1108 are met. This process for achieving greater pricing flexibility is no different from that which exists today. The

[3] Mr. Shooshan recommends 20 percent annual price reductions until parity with interstate rates is achieved. His recommendation refers generally to access, with no distinction between switched and special access. Qwest's special access and private line tariffs have been merged.

same pricing flexibility could be achieved under ROR regulation with the same showing. Thus, Mr. Shooshan's plan provides no improvement in the prospect for increased pricing flexibility.

Mr. Shooshan goes on to state that "a less rigorous test might be warranted once a price-cap plan is in place" (Id., p.11, L.14-25) and suggests limiting the number of alternative providers to one and no longer considering market share as examples of a less rigorous test. Such details should be specified now for Qwest to evaluate the proposed plan.

Q. DOES THE PRICE-CAP INDEX FOR BASKET 1 ALLOW ANY REBALANCING OF RATES OR ANY OTHER PRICING FLEXIBILITY?

A. No. Mr. Shooshan states that prices within Basket 1 "could be increased or decreased as long as the weighted average price level for the basket as a whole is within the overall price-cap index." (Id., p. 12, L. 7-9) However, given the so-called "hard cap" in which no price could be increased above the level existing on the first day of price regulation and the inclusion of a consumer dividend in the price-cap index, no meaningful rebalancing or pricing flexibility is being offered to Qwest.[4]

This is best illustrated by examining the operation of the "hard cap" and price-cap index in the first year of the plan. With all prices set at their starting levels, and no ability due to the "hard cap" to raise any price in Basket 1 above its starting level, there is no opportunity to accomplish any

[4] The price-cap index should not be confused with the granting of price flexibility. It is nothing more than a surrogate for rate case ratemaking, albeit a formula that is self-activating.

rebalancing.5 The fact of the matter is that the only pricing flexibility offered is downward pricing with no concomitant opportunity to make offsetting increase in other prices.6 Only if Qwest were to make broad price reductions among the services in Basket 1 would it have the ability to accomplish any measure of rate rebalancing and then only by reducing some prices more than others.

Q. OVERALL, IS THE PRICE REGULATION PLAN PROPOSED BY MR. SHOOSHAN ACCEPTABLE TO QWEST?

A. No, it is not. Given that Mr. Shooshan's alternative price regulation plan offers no greater price flexibility than exists today, and appears to take away existing price flexibility, Qwest is unable to conclude that the proposed plan is a move forward.

---

[5] By definition, "rebalancing" means raising some prices while lowering other prices.

[6] It is interesting to note that if in year 2 inflation less productivity less the consumer dividend was positive, Qwest would have the authority, but not the means, to raise the overall weighted average price because the "hard cap" prevents any individual prices from being raised higher than its initial price.

THE QWEST ALTERNATIVE PROPOSAL

Q. PLEASE DESCRIBE MODIFICATIONS TO MR. SHOOSHAN'S PROPOSED PRICE REGULATION PLAN THAT QWEST WOULD FAVOR.

A. Qwest would favor a two "basket" approach in which the pricing controls within the baskets are different than that proposed by Mr. Shooshan. Plus, Qwest believes that the competitive zone concept can be combined with the "basket" approach.

Q. PLEASE DESCRIBE THE TWO BASKET APPROACH.

A. There would be two baskets. Basket 1 would be "basic/essential" services.7 Basket 1 would have the same services as in Mr. Shooshan's proposal, but with the following changes:

(1) Switched access services would be included in Basket 1. Switched access services appear in Mr. Shooshan's Basket 2, which is eliminated in the Qwest proposal.

(2) Flat rated residential and business local service would continue to be included only to the extent of the primary line, i.e., the first line. This basket is limited to the first line in recognition of the emergency nature of

[7] For convenience, I have maintained the same basket labels as Mr. Shooshan. There is no intended correlation between the meaning of "basic" and "essential" as used in my testimony with any definition of those terms as may appear in any Arizona Commission order.

local service. The second line and beyond are included in a new Basket 38 in order to achieve parity in price flexibility with competitors.

(3) PBX trunks, including features, would continue to be included in Basket 1, but only to the extent of the primary trunk, i.e., the first trunk. The reason is the same as with flat rated residence and business.

(4) Telephone Assistance Program would remain in Basket 1, but any price controls would be limited to changes in funding sources. In other words, if any external to Qwest funding sources change, their effects would automatically be flowed through to customers.

(5) Services to non-LEC payphones would be included in Basket 1. These are in Basket 2 of Mr. Shooshan's proposal.

(6) Existing service packages will switched to the Qwest Basket 3. Several of the existing service packages, e.g., Custom Choice and Value Choice, already have price flexibility. It makes no sense that they, other existing packages, and new packages would be treated differently.

(7) In Mr. Shooshan's proposal, all other services that have not been classified as "competitive" or which are not currently afforded flexible pricing are included in Basket 1. In the Qwest proposal, all other services that are not explicitly listed in Basket 1 will be included in Basket 3. Basket 3 by Mr. Shooshan's own admission include "nonessential"

[8] In order to maintain a parallel with Mr. Shooshan's proposal, the Qwest two baskets are labeled 1 and 3. There is no Basket 2.

services. It is reasonable that that which is not "basic" or "essential" is "nonessential."

Q. PLEASE DESCRIBE THE QWEST BASKET 3.

A. Basket 3 would include the services listed by Mr. Shooshan and the additions enumerated above. In addition, Basket 3 would include special access/private line, which reside in Mr. Shooshan's Basket 2. The Commission has previously granted pricing flexibility. It would be reasonable and appropriate to maintain that price flexibility by including special access/private line in the Qwest Basket 3.

Q. HAVE YOU SUMMARIZED THE QWEST TWO BASKET APPROACH IN AN EXHIBIT?

A. Yes. Exhibit CTI-2 lists the services in each of the two baskets.

Q. HOW SHOULD WHOLESALE SERVICES BE TREATED?

A. Other than switched access, special access, and payphones, wholesale services offerings such as unbundled network elements, should continue to be regulated pursuant to the Commission's oversight of interconnection agreements and through the arbitration hearing and cost docket processes. I believe that this treatment is consistent with Mr. Shooshan's testimony, although I would not add wholesale services to either of the baskets. (Id., p.12, L. 17-21)

Q. PLEASE DESCRIBE QWEST'S PROPOSED PRICE CONTROLS THAT WOULD APPLY TO BASKET 1.

A. The services in Basket 1 would be subject to an overall weighted average price cap as described by Mr. Shooshan. (Id., p. 12, L. 1-9) This overall weighted average price cap would be fixed for the term of the plan. There would not be a so-called "hard cap" on individual services, nor would the weighted average cap be subject to Mr. Shooshan's proposed price-cap index.

Within Basket 1, Qwest would be allowed to rebalance prices as long as the weighted average price of the basket did not increase beyond the level that exists after rates are determined in the rate design portion of this docket.

Q. DOES THIS MEAN THAT SWITCHED ACCESS RATES WOULD BE LOWERED?

A. Yes. Qwest's proposal in the rate design portion of this docket is that switched access rates be reduced. Assuming that the Commission reduces switched access rates, such a reduction would be reflected in the weighted average price cap for Basket 1. Subsequently during the term of the price regulation plan, reductions in switched access could be made in conjunction with rate rebalancing with other services in Basket 1. The inclusion of switched access in Basket 1 would allow for reasonable rate rebalancing to proceed.

Q. PLEASE DESCRIBE QWEST'S PROPOSED PRICE CONTROLS THAT WOULD APPLY TO BASKET 3.

A. The services in Basket 3 would be subject to an overall weighted average price cap, similar to that described for Basket 1, but that is 15 per cent

above the weighted average prices established by the Commission at the conclusion of this docket. This overall weighted average price cap would be fixed for the term of the Plan. Qwest would be free to adjust the prices of services in Basket 3 upward or downward as long as the weighted average prices of the services in Basket remained equal to or less than the weighted average price, plus 15%, that existed on the effective date of the Plan.

Q. WHAT ROLE WOULD COMPETITIVE ZONES PLAY IN THE QWEST PROPOSED PRICE REGULATION PLAN?

A. Competitive zones would exist in conjunction with the basket approach. A mechanism is needed in which regulatory recognition is given to the geographic nature of competitive entry. It is well known that competitors enter urban geographic areas, with an array of telecommunications, internet, and video services. Thus, Qwest proposes that competitive zones be based upon geographic designations and upon Commission order adopting the competitive zones, services within the zones would be moved to Basket 3, assuming they were not already in Basket 3.

Q. WERE THE DETAILS OF COMPETITIVE ZONES PREVIOUSLY DESCRIBED IN QWEST TESTIMONY?

A. Mr. Teitzel previously outlined Qwest's competitive zone proposal in his Direct Testimony.

Q. DOES QWEST CONTINUE TO PROPOSE CERTAIN COMPETITIVE ZONES BE APPROVED BY THE COMMISSION IN THIS DOCKET?

A. Yes. Mr. Teitzel's recommends such designations in his Direct Testimony.

Q. MR. SHOOSHAN CRITICIZES COMPETITIVE ZONES. DO YOU AGREE?

A. No, I do not. Mr. Shooshan testifies that competitive zones can be confusing to customers and needlessly complex to oversee and administer. (Id., p. 4, L.8-11) Competitive zone process has been operational in the State Oregon since 1996. Previously, statewide competitive zones have been approved in Oregon for several local exchange carriers, including Qwest, for private line services. Most recently, the Oregon Commission approved competitive zone designation in 49 Qwest exchanges for residence and business local basic services. This approval was accomplished without the Oregon Commission holding a public hearing. The Oregon Commission Staff, operating with criteria established by the Commission, simply confirmed by contacting CLECs that the criteria was being met and notified the Commission of its findings. The Oregon Commission then approved the creation of the newest competitive zones.

The Utah Commission recently approved via a bench order the establishment of a competitive zone along the Wasatch Front in which all Qwest business local services were granted price flexibility.

The Oregon and Utah Commissions have not determined that competitive zones are confusing to customers, nor needlessly complex to oversee or administer.

Q. WHAT TERM DOES QWEST PROPOSE FOR THE PLAN?

A. Qwest proposes that the price regulation plan have a 3 year term with a 90 day window in which Qwest may elect to renew the plan for another 3 year term.

Q. WHY DOES QWEST PROPOSE A 3-YEAR TERM WITH A 90 DAY WINDOW TO RENEW?

A. As outlined in the rebuttal testimony of Mr. Redding, the Arizona intrastate year 2000 financial returns for the first 5 months of the year point to a significant decline in intrastate earnings. The Company believes this earnings trend reflects increased efforts to improve service quality. Improvement in service quality has been a concern of the Commission. Increased depreciation expense as a result of the represcription ordered by the Commission adds more expense.

It is impossible for Qwest to predict the outcome of the ratemaking portion of this docket, both revenue requirement and rate design.[9] Given the uncertainty as to the final outcome of the revenue requirement and rate design portions of this docket, Qwest is unable to commit to a price regulation plan longer than the proposed 3 year term, if to a price regulation plan at all.

Q. WHAT DOES QWEST PROPOSE WOULD HAPPEN AFTER THE EXPIRATION OF THE SECOND 3 YEAR TERM?

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[9] For instance, Staff proposes a minimal $7 million rate increase and RUCO proposes a $28 million rate reduction.

A. In the event that Qwest elected to renew the Plan for the second 3 year term, at its expiration, Qwest proposes that rate of return regulation not be reinstated, provided that the Commission and the FCC will have granted 271 approval. This provision eliminates the possibility of a rate case in 6 years whereby any competitive losses would be passed back to basic customers at that time. Conditioning this provision on 271 approval assures that the markets in which Qwest participates in, Qwest's network, and Qwest's operational support systems have been opened to competitors.

At the expiration of the second 3 year term, the Commission would either deregulate the Qwest operation or institute another price regulation plan.

Q. WILL THE PRICE REGULATION PROPOSED BY QWEST PROVIDE THE CUSTOMER BENEFITS DESCRIBED BY MR. SHOOSHAN?

A. Yes, I do. The Qwest proposed price regulation plan shifts the risk associated with increasing competition from basic customers to the Company. Qwest will not be able to ask the Commission to increase basic service rates, even at the expiration of the plan.

This plan eliminates many existing regulatory processes. Rate cases would be eliminate along with the time consuming process of financial audits and interrogatories, rounds of testimony, and extensive hearings, not to mention the legal wrangling that is inevitable.

The Qwest price regulation plan includes reasonable controls on price changes on the services in Basket 1. The overall weighted average price

cap ensures that prices cannot be increased without the lowering of prices of other services in Basket 1. It is reasonable to include switched access in Basket 1 so that rate rebalancing will occur over time.

Reasonable price controls apply to Basket 3 where the same overall weighted average price cap as Basket 1, but with an additional 15% upward limit. Given that the services in Basket 3 are either competitive or non-essential and that this price regulation plan replaces ROR regulation and its accompany process for raising rates, it is reasonable that Qwest be given some measure of upward pricing flexibility on an overall basis for Basket 3. The 15% increment is the only element in the Qwest Plan whereby Qwest could increase its net revenues by raising prices without a concomitant reduction in other prices.

The separation of services between Basket 1 and 3, each with separate overall price caps, prevents cross-subsidization between the basic services in Basket 1 and the advanced, competitive, or non-essential services in Basket 3.

The Qwest Plan leaves in place Commission oversight of service quality, customer remedies, and payments.

The inclusion of new services and packages in Basket 3 provides incentive to Qwest to offer innovative services and service packages, including new price plans.

The flexibility to adjust prices of the services in Baskets 1 and Basket 3 in combination with the competitive zones provides increased incentive to Qwest to make capital investment in the State of Arizona in order to meet competitors.

Q. HAVE YOU PROVIDED A DESCRIPTION OF THE COMPLETE DETAILS OF THE QWEST PROPOSED PLAN?

A. Yes. Exhibit CTI-3 provides the Commission with a detailed description of the Qwest proposal.

RESPONSE TO OTHER PORTIONS OF MR. SHOOSHAN'S TESTIMONY

Q. MR. SHOOSHAN PROPOSES THREE CONDITIONS WITH RESPECT TO CURRENT LITIGATION INVOLVING QWEST. DO YOU AGREE WITH THE CONDITIONS?

A. No, I do not. As I understand the litigation, the issue is over disparate treatment by the Commission in how it regulates competitors of Qwest versus how it regulates Qwest. I believe that disparate treatment is largely eliminated in the price regulation plan described in this testimony. The adoption of the Qwest price regulation plan is the way to resolve the current litigation.

As I explained in Section 2 of this testimony, the price regulation plan proposed by Mr. Shooshan does not close the gap in terms of the pricing flexibility competitors of Qwest are afforded by the Commission. Rather, it appears that Qwest pricing flexibility would actually be diminished by Mr. Shooshan's plan. Thus, his recommendation that Qwest be required to withdraw current litigation, agree not to pursue new litigation, and intervene in support of the Commission in any litigation filed by another party is unacceptable.

Q. IS MR. SHOOSHAN'S RECOMMENDATION THAT THE COMMISSION CONSIDER A PRICE OFFSET RELATED TO SERVICE QUALITY REASONABLE?

A. No, it is not. The Company's service quality was addressed in Docket No. T-01051B-99-0497, the merger of Qwest and U S WEST. In its order

approving the merger, the Commission made certain changes that have the effect of increasing amounts that Qwest will have to pay for service quality. The areas in which increased payments will be made are exactly the three areas of operations (access to centers, held orders, and out of service repair) in Mr. Shooshan's testimony (Id., p. 19, L.7-24). It is unreasonable that less than 2 months after merger approval that Staff would propose more regulatory conditions for that which was already addressed in the merger docket.

Q. MR. SHOOSHAN SUGGESTS THAT QWEST PROPOSE SPECIFIC INVESTMENT COMMITMENTS AS PART OF A PRICE REGULATION PLAN. WHAT IS YOUR RESPONSE?

A. In Docket No. T-01051B-99-0497, Staff recommended that Qwest commit to invest a minimum of $692 million in Arizona for each of the next two years from the date of the order approving the merger. Qwest stated that it was committed to continuing to make the necessary investments in Arizona. The Commission did not accept Staff's proposal, but rather ordered a minimum of $402 million of capital investment for the years 2000 and 2001, with at least 12% of that amount, $48 million, directed toward the upgrade and extension of services in Qwest exchanges of 50,000 access lines or less.

Investment of a specified amount capital will not necessarily improve service quality. The Commission addressed service quality in the merger docket when it ordered higher service quality payments. A commitment in this docket of additional capital investment to improve service quality is not necessary.

With respect to capital investment to support new services, the price regulation plan should be constructed so that sufficient incentive exist that all competitors have the incentive to offer new services.

Q. DOES THIS CONCLUDE YOUR TESTMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF	)	
U S WEST COMMUNICATIONS, INC., A COLORADO	)	
COLORADO CORPORATION, FOR A HEARING	)	
TO DETERMINE THE EARNINGS OF THE COMPANY,	)	
THE FAIR VALUE OF THE COMPANY FOR	)	DOCKET NO.
RATEMAKING PURPOSES, TO FIX A JUST AND	)	T-01051B-99-0105
REASONABLE RATE OF RETURN THEREON AND	)	
TO APPROVE RATE SCHEDULES DESIGNED TO	)	
DEVELOP SUCH RETURN	)	

EXHIBITS OF CARL INOUYE

ON BEHALF OF

QWEST CORPORATION

AUGUST 21, 2000

INDEX OF EXHIBITS

Witness Qualifications	CTI-1
Price Regulation Plan Proposed by Qwest, Proposed Service Baskets	CTI-2
Qwest Corporation, Arizona Price Regulation Plan	CTI-3

Carl Inouye
Witness Qualifications

Present Employment:

Lead Director – Financial Advocacy
Responsible for regulatory matters of a financial nature in the states USWC operates

Academic Experience:

BA – University of Washington, Economics
BS – University of Washington, Mechanical Engineering
MA – University of Washington, Economics

Prior Work Experience:

1974-1977: Pacific Northwest Bell Telephone Company, Business Research Section; responsible for economic and econometric studies

1978-1981: AT&T; managed preparation of witnesses and their economic studies for the U.S. v. AT&T antitrust suit that led to the breakup of the Bell System, worked in areas of financial effects of divestiture on the Bell System, network planning and operations, demand and cost modeling, organization theory and design, and research and development.

1992-1987: U S WEST Communications; worked in various positions in finance and treasury involving long term debt financing, jurisdictional separations, acquisitions, financial planning

Testifying Experience:

Oregon:

UT 80: Alternative Form of Regulation
UT 85: general rate case
UM 295: research and development policy
UP 96: sale of telephone exchanges to PTI
UT 119: collocation tariff
CP 1, 14, 15: entry of local exchange competitors
UM 351: pricing and costing policy
UT 125: general rate case

Utah:

91-049-13: deregulation of voice messaging
92-049-05: general rate case
94-049-08: general rate case
95-049-05: general rate case
97-049-08: general rate case
92-999-04: adoption of SFAS 106
93-049-22: adoption of SFAS 112
94-049-02/03: sale of exchanges
89-049-11/21: contribution expenses on remand
88-049-18: tax reform act on remand
93-999-01: competitive entry and regulatory reform

Washington

UT-961596: sale of Bellcore
UT-970766: general rate case

UT-980948: directory imputation
UT-991358: Qwest/U S WEST merger
UT-003013: Cost and Pricing of UNE Transport, Termination, Resale

Idaho
USW-S-96-5: general rate case

Arizona
T-01051B-99-0497: Qwest/U S WEST merger

PRICE REGULATION PLAN PROPOSED BY QWEST
PROPOSED SERVICE BASKETS

Basket 1 – Basic/Essential Services:
Flat Rate Residential – Primary Line only
Flat Rate Business – Primary Line only
2 & 4 Part Service
Exchange Zone Increment Charges
Low Use Option Service
Service Stations Service
Telephone Assistance Programs
Individual PBX Trunks, incl features – Primary Trunk only
Caller ID Block
Toll Blocking
900/976 Blocking
Basic Listing Service
Switched Access Services
Non-LEC Payphones (i.e., answer supervision, payphone access line)

Basket 2: not used

Basket 3 – Advanced/Competitive/Nonessential Services:
Transparent LAN Service
Frame Relay Service
Megabit Services
Lan Switching Service
ATM Cell Relay Service
Private Line Transport Services (includes Special Access)
CustomChoice – Residence and Business
Value Choice with CallerID
Value Choice with Call Waiting
Two Line CustomChoice
SmartSet, SmartSet Plus
Fax Package
Teen/Roommate Package
Home Office Package
Business Continuation Routing
ISDN – Single Line
ISDN – Primary Rate Service
Integrated T-1 Service
IntraCall Service
MTS
Two-Point MTS
1-800 U S WEST Calling Service
Directory Assistance – Local and National
U S WEST Complete-A-Call Service
Operator Verification/Interrupt Service
Special Hour Discount
Volume Discount
Guaranteed Rate Calling Connection

Basket 3 – Advanced/Competitive/Nonessential Services (continued)*:
Calling Connection Plans
Obsolete MTS
Special Reversed Charge Long Distance Service
Wide Area Telecommunications Service
Outward WATS
800 Service
800 ServiceLine Option
Large User Discount
Central Office Services
Customized Call Management Services/Centron I Service
Optional Service Features
Centron Custom
Centrex Plus Service
Centrex 21 Service
Centrex Prime Service
CO-ACD
Scan-Alert Service
Obsolete Central Office Services
Customized Call Management Service/Centron I
Centron 6 and Centron 30
Traffic Data Report Service
Call Data Collection and Transmission Service
Trackline Plus Service
Residence Premises Wire Maintenance
UNISTAR Service/U S WEST Repair Coordination Service
Switchnet 56 Service
Inside Wire Maintenance
New "Stand-Alone" Services
New Service Packages
All other existing Service Packages
Flat Rate Residential – Second Line and beyond
Flat Rate Business – Second Line and beyond
Individual PBX Trunks, incl features – Second Trunk and beyond

* All other services currently offered by Qwest that are not included in Basket 1 are included in Basket 3, including those that are listed below.

QWEST CORPORATION

ARIZONA PRICE REGULATION PLAN

I. PURPOSE

This Price Regulation Plan ("Plan") sets forth the terms and conditions under which Qwest Corporation ("Qwest") is regulated by the Arizona Corporation Commission ("Commission"). Upon its effective date, the Plan shall govern the prices, charges, terms and conditions for the provision of regulated telecommunications services by Qwest. While the Plan is in effect, Qwest will not be subject to rate of return regulation by the Commission.

II. EFFECTIVE DATE AND TERM

A. Expiration This plan will be effective upon the date ordered by the Commission. It will remain in effect for a term of three years from its effective date. Qwest will have the option to renew this Plan for one additional three year term upon written notice to the Commission at least ninety (90) days prior to its expiration date, upon the terms and conditions effective at the expiration date unless a new plan is submitted by Qwest for Commission approval.

B. Early Termination During the initial period or any renewal period, Qwest may terminate this Plan upon ninety (90) days written notice:

In the event the United States Congress, the Arizona Legislature or the Commission either permits deregulation of the industry or permits forms of regulation which are determined by the Commission to be less restrictive than this Plan.

C. Post Expiration If Qwest elects to renew this Plan for an additional three year term, at the end of such term and condition upon the Commission's and the Federal Communications Commission's approval of a Qwest 271 application, at the end of such additional three year term ROR regulation shall not be reinstated. The Commission shall deregulate the Qwest operations or institute another price regulation plan.

III. BASIC/ESSENTIAL SERVICES (BASKET 1)

A. Definition Basic/Essential Services are those services listed on Exhibit A.

B. Initial Prices The initial prices of basic/essential services are those set in the final rate design as ordered by the Commission in Docket No. T-01051B-99-105.

C. Price Cap The services in Basket 1 shall be subject to an overall price cap equal to the weighted average prices of the services in

Basket 1. The price cap shall be calculated based upon the initial prices of the services, weighted by current quantities, and shall remained fixed for the term of the Plan.

D. Price Changes Qwest may change prices of the services in Basket 1, either upward or downward, subject to the provision that the weighted average prices of the services in Basket 1 shall not exceed the price cap set forth in paragraph III.C. Qwest shall provide 10 days notice to the Commission prior to any price change.

Qwest may change terms and conditions of the services in Basket 1 upon 10 days notice to the Commission.

IV. ADVANCED/COMPETITIVE/NONESSENTIAL SERVICES (BASKET 3)

A. Definition Advanced/Competitive/NonEssential Services are those services listed on Exhibit A.

B. Initial Prices The initial prices of advanced/competitive/nonessential services are those set in the final rate design as ordered by the Commission in Docket No. T-01051B-99-105.

C. Price Cap The services in Basket 3 shall be subject to an overall price cap equal to the weighted average prices of the services in Basket 3, plus 15%. The price cap shall be calculated based upon the initial prices of the services, weighted by current quantities and multiplied by 1.15, and shall remained fixed for the term of the Plan.

D. Price Changes Qwest may raise prices of the services in Basket 3 upon 1 day notice to the Commission. Qwest may lower prices of the services in Basked 3 without notice to the Commission. Qwest may change terms and conditions of the services in Basket 3 upon 1 day notice to the Commission.

V. COMPETITIVE ZONE

A. Definition A competitive zone is a geographic area, no smaller than a wire center, in which the Commission has determined that competition exist such that Qwest should be allowed price flexibility as described in paragraph IV.

B. Criteria A competitive zone shall be established if at least one of the following criteria is met: 1) a competitor has facilities in place and is marketing or offering services in competition with Qwest,; 2) a reseller is marketing or offering services in competition with Qwest; or 3) a competitor is marketing or offering services through the provision of unbundled network elements purchased from Qwest.

C. Initial Designations Upon adoption of the Plan, the wire centers listed on Exhibit B are designated as a competitive zones.

D. Subsequent Designations Upon a petition and demonstration of Qwest, the Commission shall designate competitive zones when the criteria in paragraph V.B. are met. Upon designation by the Commission of new competitive zones, the services offered by Qwest in the new competitive zones shall be moved from Basket 1 to Basket 3, to the extent they do not already reside in Basket 3.

VI. INCREASES OR DECREASES DUE TO EXOGENOUS FACTORS

A. The Commission, after reasonable notice and opportunity for hearing, may prescribe proportional increases or decreases in the prices of appropriate services In Baskets 1 and 3 to reflect changes in revenues, expenses, and investments, due to exogenous factors beyond the control of Qwest.

VII. UNIVERSAL SERVICE

Qwest shall not be precluded from collecting surcharges that may be ordered by the Commission to support universal service.

VIII. INTERCONNECTION AND WHOLESALE RATES

A. The pricing of unbundled network elements shall not be affected by provisions of the Plan. Prices for unbundled network elements shall conform to those set by the Commission.

B. Discount percentages applicable to telecommunications services purchased by resellers shall be unaffected by the Plan, but the prices resellers will vary as the prices Qwest charges to its end-user customers for telecommunications services change.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105 AFFIDAVIT OF CARL INOUYE
STATE OF WASHINGTON	) :	ss
COUNTY OF KING	)	

Carl Inouye, of lawful age being first duly sworn, depose and states:

1. My name is Carl Inouye. I am Lead Director – Financial Advocacy for Qwest Corporation in Seattle, Washington. I have caused to be filed written testimony and exhibits in support of Qwest in Docket No. T-01051B-99-105

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Carl Inouye

Carl Inouye

SUBSCRIBED AND SWORN to before me this 17th day of August, 2000.

ANGIE LEIFER
NOTARY PUBLIC
COMMISSION EXPIRES 8-08-02
STATE OF WASHINGTON

Angie Leifer

Notary Public residing at
Seattle, Washington.

My Commission Expires: 8/8/02

EXHIBIT

Q-25
Admitted

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC. A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES	)	DOCKET NO. T-01051B-99-0105

REBUTTAL TESTIMONY OF

ANN KOEHLER-CHRISTENSEN

QWEST CORPORATION

AUGUST 21, 2000

REBUTTAL TESTIMONY OF ANN KOEHLER-CHRISTENSEN

INDEX OF TESTIMONY

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EXECUTIVE SUMMARY

Directory imputation in this rate proceeding is governed by a 1998 settlement agreement between Mountain Bell and the Arizona Corporation Commission. That settlement agreement provides in pertinent part as follows:

> [T]he Commission, in arriving at the test year operating income of Mountain Bell, will consider the fees and the value of services received by Mountain Bell from USWD under publishing agreements with USWD; that Mountain Bell and the Commission Staff may present evidence in support of or in contradiction to those fees and the value of those services.

In my direct testimony, I provided evidence of the current fees and the value of services received by Qwest from DEX.

Both RUCO and Staff have recommended imputation of $41.3 million, an amount calculated by subtracting $1.7 million in fees received by Qwest from DEX during the test year from a presumptive $43 million imputation amount set forth in the Settlement Agreement. The DOD recommended imputation of approximately $43 million, without recognition or reduction for the value of the fees actually paid by DEX to Qwest during the test year. Staff, RUCO and the DOD have not adequately considered the changes in the services provided under the Qwest/DEX publishing agreement or the changes in the industry that have reduced the value of the services provided to Qwest by DEX.

AT&T has completely ignored the Settlement Agreement. AT&T has erroneously advocated a methodology that has been squarely rejected by the Arizona Court of Appeals. Moreover AT&T has made several calculation errors in applying this methodology. In particular, AT&T has excluded a large portion of

DEX's expenses in its calculation of DEX's profits and it has compounded this error by multiplying pre-tax net revenues by a gross revenue conversion factor.

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Ann Koehler-Christensen. Qwest Corporation (Qwest or the Company), formerly U S WEST Communications, employs me as a Finance Analyst - Regulatory Finance. My business address is 1600 7th Avenue, Room 3008, Seattle, Washington 98191.

Q. HAVE YOU FILED TESTIMONY PREVIOUSLY IN THIS DOCKET?

A. Yes, I filed direct testimony on January 8, 1999 and supplemental testimony on May 2, 2000.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to respond to the testimony filed by Michael Brosch on behalf of Staff, Hugh Larkin, on behalf of RUCO, Richard Lee on behalf of the DOD and Lee Selwyn and Susan Gately on

behalf of AT&T with respect to their recommended Yellow Pages imputations. As a general proposition, Qwest, Staff, RUCO and the DOD all agree that the 1988 Settlement Agreement governs directory imputation in this proceeding. However, Qwest disagrees with the interpretation of the Settlement Agreement advanced by Staff, RUCO and the DOD because their interpretation does not recognize that the Settlement Agreement requires a reduction in directory imputation where there has been a reduction in the value of the fees and services provided to Qwest by DEX. AT&T, in contrast, has completely ignored the Settlement Agreement even though it has been enforced by the Arizona Appellate Court. In addition, as set forth more fully below, AT&T has made several significant calculation errors.

REBUTTAL OF STAFF, RUCO AND THE DOD

Q. WHAT DIRECTORY IMPUTATION IS RECOMMENDED BY STAFF AND RUCO?

A. Both Staff witness, Michael Brosch and RUCO witness Hugh Larkin propose directory imputation of $41.3 million. They both arrived at the imputation amount by starting with the presumptive $43 million imputation from the 1988 Settlement Agreement and reducing this amount by the

value of the actual fees received from DEX during the test year. DOD witness Richard Lee, on the other hand, recommends imputation of approximately $43 million. He does not reduce this amount by the value of the fees received from DEX during the test year as recommended by Staff and RUCO.

Q. DOES STAFF, RUCO OR THE DOD CONSIDER THE CURRENT VALUE OF SERVICES RECEIVED BY QWEST FROM DEX?

A. No. Staff and RUCO consider the fees received by Qwest from DEX, but rather than determining the current value of the services received, they rely on the $43 million level from the original agreement. Mr. Larkin's arguments ignore the value of the services and asserts that the Company's position goes against the spirit and intention of the Settlement Agreement. Mr. Brosch argues that it is necessary to put back what was removed in 1984. Mr. Lee argues, in opposition to the 1996 findings of the Arizona Court of Appeals, that the presumptive amount should not be reduced unless the Company demonstrates that the profits generated by DEX have fallen since 1984.

Q. DOES YOUR PRIOR TESTIMONY IN THIS PROCEEDING CONFLICT WITH THE SETTLEMENT AGREEMENT?

A. No, my direct and supplement testimony accepts the Settlement Agreement as the document that governs directory imputation in this case. The Settlement Agreement provides that the transfer of the Yellow Pages will no longer be challenged and that in future rate cases:

> ... the Commission, in arriving at the test year operating income of Mountain Bell, will consider the fees and the value of services received by Mountain Bell from USWD under publishing agreements with USWD; that Mountain Bell and the Commission Staff may present evidence in support of or in contradiction to those fees and the value of those services (emphasis added).

Thus, the Settlement Agreement provides that imputation will be based upon the fees and value of services received by Qwest from DEX. While Mr. Brosch claims the current value is higher than I maintain, he provides no analysis or calculations to support his claim. In fact, the only calculation he provides is based on the profits of DEX, a methodology that the Arizona Appellate Court has squarely rejected. In his testimony Mr. Brosch acknowledges that the Arizona Court of Appeals determined that:

> The imputation method approved in the agreement was not the excess-profit imputation, but rather a method dependent upon proof of "the fees and the value of services received by Mountain Bell from USWD under the publishing agreements with USWD." [1]

Q. WHAT ABOUT THE ESTIMATE OF THE FEES AND VALUE OF SERVICES MR. BROSCH PRESENTS AT PAGES 47 THROUGH 48 OF

1 **HIS TESTIMONY?**

2

3 A. The estimate Mr. Brosch provided is just a roundabout way of calculating
4 directory imputation using DEX's profits in excess of Qwest's authorized
5 rate of return. He has not presented a calculation that is consistent with
6 the language of the Settlement Agreement. In particular, he ignores the
7 changes in the contractual relationship between the Company and DEX,
8 the legislative and regulatory changes that have reduced the value of the
9 services provided and the considerable changes that have occurred in
10 both the publishing and the telecommunications industries. Instead, he
11 attempts to value the services based strictly on the growth in DEX
12 revenues and profits; precisely what the Court of Appeals determined was
13 not appropriate.

14

15 **Q. DO DEX AND THE COMPANY "JOINTLY PRODUCE" DIRECTORIES?**

16

17 A. No. The Company has a contract with DEX to assure that its regulatory
18 obligations are met and that directories are published and delivered to all
19 Qwest's customers. This contract is the same as DEX has with over one
20 hundred CLECs and ILECs. The Company provides DEX with the same

[1] U S WEST COMMUNICATIONS, Inc. v. Arizona Corporation Commission, 185 Ariz. 277, 915 P.2d 1232 (App 1996)

information it provides to all publishers. DEX is responsible for the scoping, formatting, production, printing, and delivery of its directories and incurs all the expenses. It is not a joint production and it is not justification for imputing the profits of DEX's directory operations.

Q. MR. BROSCH ASSERTS THAT THE COMPANY SHOULD HAVE OBTAINED COMPETITIVE BIDS FOR THE PUBLICATION OF THE WHITE PAGES. HAS HE PROVIDED ANY EVIDENCE THAT SOLICITATION OF COMPETITIVE BIDS WOULD HAVE RESULTED IN PAYMENTS TO QWEST?

A. No. Mr. Brosch has frequently claimed that the Company should have obtained competitive bids, however he has provided no evidence of what the results of such a bid may have been. He has no evidence, because there are no comparable transactions on which he can rely. None of the RBOCs have ever solicited bids. To my knowledge, no CLECs or ILECs have solicited bids in the last fifteen to twenty years. DEX has been publishing directories as a separate affiliate for the last sixteen years and has never been asked to bid for the right to be the official publisher of a CLEC or ILEC. DEX has publishing agreements with thirteen CLECs and approximately one hundred ILECs primarily because DEX has initiated the discussions that have led to these publishing agreements, although in a

few cases DEX has initially been contacted by the CLEC or ILEC.

Q. HAS ANY PUBLISHER EVER APPROACHED QWEST AND OFFERED TO MEET THE COMPANY'S OBLIGATIONS IN EXCHANGE FOR BEING THE COMPANY'S OFFICIAL PUBLISHER.

A. No publisher has ever approached the Company and the Company has no reason to believe that another publisher would offer the Company an arrangement that would be more favorable than the current publishing agreement with DEX. All publishers have access to the Company's subscriber lists at the FCC-prescribed price, without assuming any obligations. Even Mr. Brosch was not willing to state that another publisher would offer the Company more. He did claim that the Company could contract with another publisher and "at an absolute minimum receive publishing and distribution at no cost in return for the granting of official publisher status." He has provided no evidence to support this assertion.

Q. WHAT ABOUT THE UNIQUE BENEFITS MR. BROSCH HAS LISTED ON PAGE 33 OF HIS TESTIMONY?

A. Mr. Brosch has listed seven "unique benefits" of DEX's affiliation with the

Company that he believes justify the continuation of publishing fees or imputation. I list these alleged "benefits" below and comment on each one.

1) *Exclusive right to publish, including the use of common trade names and marks.*

The use of common trade names and marks is irrelevant in that it is a result of having the same corporate owner. The right to use these names and marks are not provided by the Company. There is no exclusive right to publish. If Mr. Brosch means that DEX is the official publisher, this status merely obligates DEX to provide services that other publishers are not obligated to provide. This same term is included in DEX's publishing agreements with other ILECs and CLECs.

2) *Public perception that the directory is the sole "official book".*

There has been absolutely no evidence presented that establishes that such a public perception actually exists.

3) *Exclusive placement and maintenance of USWD directories in Company payphones.*

To the extent that there is value here, it is value that already flows to the Company and to payphone users. It does not justify additional imputation under the Settlement Agreement.

4) *Exclusive provision of billing and collection services.*

DEX pays Qwest for this service, billing and collection services are readily

available from numerous sources and no other publisher has requested such a service from the Company.

5) *Exclusive arrangements for purchase of directory advertising account receivable by the Company.*

Purchase of account receivable is simply the method by which Qwest turns over directory advertising revenues collected on behalf of DEX. It is the same process that the Company uses for interexchange carriers.

6) *Benefits of shared corporate management, etc.*

These benefits are a result of being owned by a larger parent company. Most publishers are also part of larger corporate organizations through which similar services and benefits are available.

7) *Referrals of USWC customer inquiries regarding directory advertising.*

DEX pays for these referrals and they are not grounds for additional publishing fees or imputation.

Q. DOES DEX INAPPROPRIATELY EARN AND RETAIN REVENUES FROM SELLING WHITE PAGES ADVERTISING?

A. No. When the directory operations were part of Mountain Bell, the Company did not sell advertising in the white pages. The Company and most other LECs sell premium white pages listings, not white pages advertising. The Company has developed its own listing business by

licensing subscriber listings to all directory publishers [2] as well as marketing Premium White Pages Listings. The test year revenues from Premium White Pages Listings exceeded $17 million and the total directory revenues in Account 5230 was $18.7 million. Publishers, not LECs, sell white pages advertising.

Q. IS IT REASONABLE TO ASSUME THAT THE COMPANY COULD SIMPLY REENTER THE PUBISHING BUSINESS AND EARN A NET PROFIT?

A. It is not reasonable to expect that this could occur in the first few years. Qwest has no trained directory advertising sales force, no paper and printing contracts, no publishing systems or software and no experience in this business. In my opinion, it would take the Company a number of years before it could realize a profit. In the mean time, all the considerable expense associated with publishing and distributing directories would have to be borne by the ratepayers.

Q. HAS THE VALUE OF THE OFFICIAL PUBLISHER STATUS INCREASED OVER THE YEARS?

[2] The Company has long offered its lists to independent publishers. Starting in 1987, the Company provided its lists at the same market rate to all publishers, including DEX. Since December 1999 the

1

2 A. No. In fact, the value of official publisher status has decreased over the
3 years. Court and regulatory decisions have systematically reduced
4 advantages of affiliate or official publisher status. It is for this reason that
5 publishing fees, once common industry practice, have virtually
6 disappeared. Publishers generally meet regulatory obligations in
7 exchange for listings and/or official publisher status. In Qwest's case,
8 DEX meets the Company's regulatory obligations and also pays for
9 subscriber listings.

10

11 **Q. ARE ARIZONA RATEPAYERS ENTITLED TO THE YELLOW PAGES**
12 **BUSINESS?**

13

14 A. No, under the Settlement Agreement, in arriving at the test year operating
15 income, the Commission must consider the "fees and the value of
16 services" received by Qwest from DEX. Arizona ratepayers have no
17 greater entitlement under the Settlement Agreement.

18

19 **REBUTTAL OF AT&T**

20

21 **Q. DOES AT&T WITNESS, LEE SELWYN, BASE HIS IMPUTATION**

Company has made its listings available to all publishers at the FCC-prescribed rates.

RECOMMENDATION ON THE SETTLEMENT AGREEMENT?

A. No, he bases his imputation recommendation on the imputation calculation that the Arizona Appellate Court rejected. Even on that erroneous basis, he has miscalculated the amount of imputation.

Q. WHAT REASONS DOES DR. SELWYN OFFER FOR HIS RECOMMENDED IMPUTATION?

A. Dr. Selwyn offers six basic reasons for his recommended imputation. These are:

1. His version of the historical development of the Yellow Pages business
2. His claim that there was a lack of compensation for the transfer of the business
3. His unsubstantiated claim that there is no competition in the Yellow Pages business
4. DEX's level of profitability
5. His claim that there is a need to support basic residential service in order to achieve and maintain high penetration of local telephone service
6. The recent outcome of the Washington directory case

Q. ARE THESE VALID REASONS FOR IMPUTING $314 MILLION AS RECOMMENDED BY AT&T?

A. Absolutely not. None of the reasons presented by Dr. Selwyn are legitimate grounds for continuing directory imputation because none are recognized by the Settlement Agreement.

Q. HAS DR. SELWYN CONSIDERED THE FEES AND VALUE OF SERVICES RECEIVED BY QWEST FROM DEX?

A. No. Dr. Selwyn doesn't consider the fees and value of services received by Qwest from DEX at all. He simply describes his version of the history of the development of the directory business and relies on Judge Greene's nearly twenty year-old comments about the significant subsidy provided from Yellow Pages. Dr. Selwyn ignores the Settlement Agreement and the changes that have occurred in both the telecommunications and directory publishing industries in the last eighteen years.

Q. WHAT ABOUT DR. SELWYN'S CLAIM THAT NO SPECIFIC COMPENSATION WAS PAID FOR THE TRANSFER OF THE

BUSINESS ASSET FROM THE OPERATING TELEPHONE COMPANY?

A. In commenting on the consideration at the time of the transfer, Dr. Selwyn has chosen to tell only part of the story. He has conveniently ignored the extremely large contribution to rates that Arizona ratepayers have received over the last sixteen years. Since the transfer of the business in 1984, Arizona ratepayers have had their rates reduced by more than $700 million and have received high quality directories at no cost. Thus, it is inaccurate to say the compensation for the transfer has not been paid. Furthermore, imputation is now and has since 1988 been governed by a Settlement Agreement. The Settlement Agreement itself bars any challenge to the transfer.

Q. DOES COMPETITION, OR THE LACK THEREOF, EFFECT THE APPROPRIATE LEVEL OF IMPUTATION?

A. No. Whether or not DEX has competition is not a factor that is considered in the Settlement Agreement.

Q. DOES DEX HAVE COMPETITION?

A. Very definitely. DEX is in the advertising business. Selling directory advertising is the way DEX earns its revenues and covers the

1 considerable expenses associated with publishing their directories. DEX
2 competes with other directory publishers as well as with other forms of
3 advertising such as newspaper, television, radio, direct mail, magazine
4 and outdoor advertising.
5
6 It is amazing that Dr. Selwyn has claimed that DEX is a de facto
7 monopoly, while working for AT&T, the company that originally planned
8 for the directory operations to be placed with AT&T at divestiture because
9 it was a competitive business. Even Judge Greene recognized that
10 Yellow Page advertising was competitive in 1982 when he determined that
11 the Operating Companies should not be prohibited from participating in
12 the Yellow Pages publishing business :

13 Similarly, there is no possibility of improper discrimination by the
14 Operating Companies against competing directory manufacturers
15 since access to the local exchange network is not required for
16 production of a printed directory. In short, the Operating
17 Companies would have little or no ability to discriminate against
18 competitors in the printed directory market, and this restriction thus
19 has no procompetitive justification whatever. [UNITED STATES v.
20 AMERICAN TEL. AND TEL. CO. §82 f. Supp. 131 (1982)]
21
22 Since that time, competition has only increased.
23
24 Dr. Selwyn makes extraordinary claims with respect to the "fortress-level
25 market power" of DEX without providing evidence to support his claims.
26 He refers briefly to two very old cases of directories that were not

successful and draws the erroneous conclusion that "in virtually every instance" an entrant's activity is "limited to a particular market niche that is not directly served by the incumbent Yellow Pages publisher." His claims do not apply to Arizona and should be disregarded.

Q. WHAT TYPE OF COMPETITION DOES DEX FACE IN ARIZONA?

A. There are at least seven other directory publishers that compete with DEX in Arizona. The listings of only five exchanges served by the Company do not appear in directories published by competitive directory publishers. These exchanges are Buckeye, Circle City, Gila Bend, Wickenburg and Yarnell. They consist of less than 1% of Qwest's access lines in Arizona and all but Buckeye are included in the pending sale to Citizens.

The subscriber listings of twenty-two exchanges appear in directories published by DEX and one other publisher, Phone Directory Company (PDC). Sixteen of these twenty-two exchanges are also part of the sale to Citizens. The other six exchanges appear in one or more PDC directory that competes head-to-head with DEX.[3] PDC is a large independent

[3] The Casa Grande, Coolidge, Eloy and Florence exchange listings appear in the DEX Casa Grande directory and the PDC Casa Grande directory as well as the PDC South Central Arizona directory. The Company's Payson exchange listings appear in the DEX Payson directory as well as the PDC Payson directory. The Company's Sierra Vista exchange listings appear in the DEX Cochise County directory as well as the PDC Douglas-Bisbee Regional, Sierra Vista and Southeastern Arizona directories.

publisher that publishes numerous directories in eleven states and a number of Canadian provinces and territories. PDC publishes seventeen directories in Arizona.

The listings of the remaining exchanges served by the Company appear in at least 3 different directories.[4] Some exchange listings appear in as many as seventeen competitive directories published by five different publishers, in addition to the directory published by DEX. Exhibit AKC-1 provides a list of Company exchanges and the directories in which these exchange listings are known to appear. Dr. Selwyn can claim that there is no consequential competition, but he has provided no evidence and he is incorrect.

Q. WHAT ABOUT DR. SELWYN'S CLAIM THAT DEX'S EARNINGS INDICATE THAT THERE IS NO EFFECTIVE COMPETITION?

A. The Arizona Court of Appeals has already determined that the profits of DEX are not an appropriate basis for an imputation, so even if DEX earned higher returns than other companies, it would not bear on imputation in this proceeding. The reality is that, although DEX is a very

[4] For example the Prescott exchange listings appear in the DEX Prescott directory, the PDC Prescott directory and the JHZ Prescott directory.

profitable company, Dr. Selwyn has provided no evidence that DEX is significantly more profitable than other directory publishers. DEX's success as a publisher is certainly not justification for subsidizing residential basic exchange service as recommended by AT&T.

Q. DO YOU ACCEPT DR. SELWYN'S NOTION THAT SUPPORT OF PRIMARY RESIDENTIAL ACCESS AT SOME LEVEL IS NECESSARY IN ORDER TO ASSURE THE ACHIEVEMENT AND MAINTENANCE OF HIGH PENETRATION OF LOCAL TELEPHONE SERVICE?

A. No, I do not. This is outdated logic that is in direct conflict with the direction of the federal Telecommunications Act of 1996. Pricing residential basic exchange service further below cost is not economically efficient; it actually reduces economic efficiency. Dr. William Taylor further addresses this issue in his testimony.

Q. ARE THE ISSUES IN THIS CASE THE SAME AS THE ISSUES ADDRESSED IN THE STATE OF WASHINGTON RECENTLY?

A. No, the Settlement Agreement and the decision from the Arizona Court of Appeals specifically dictate that the fees and value of services received by Qwest from DEX are to be the basis for any directory imputation.

1 Washington, on the other hand, had a decision from its state Supreme
2 Court that directed the Commission to cease imputation if and when the
3 Company could demonstrate that the Company had received fair market
4 value for the transfer of the directory business.
5
6 **Q. ARE THE IMPUTATION CALCULATIONS MADE BY AT&T WITNESSES**
7 **DR. SELWYN AND MS. GATELY ACCURATE?**
8
9 A. No. Setting aside that AT&T's imputation calculation is not permitted
10 under the Settlement Agreement, AT&T made two significant errors in
11 calculating its recommended directory imputation amount. First, Dr.
12 Selwyn inaccurately derived a pre-tax net income amount. Rather than
13 using the revenues and expenses after they were fully allocated to
14 Arizona, Dr. Selwyn chose to use the yellow pages advertising revenues
15 directly assignable to Arizona less the directly assignable expenses. The
16 problem with this approach is that approximately 97.5% of DEX's
17 revenues are directly assigned to the state level, while only about 30% of
18 DEX's expenses are directly assigned. As a result, Dr. Selwyn's so-called
19 pre-tax net income is drastically overstated. Second, Ms. Gately further
20 compounded Dr. Selwyn's error by applying the Company's gross revenue
21 conversion factor and making no allowance for a reasonable return. The
22 effect of applying the revenue conversion factor is that it inappropriately

increases the already ridiculously high net income number by another 70%.

CONCLUSION

Q. HAVE STAFF, RUCO OR AT&T PRESENTED ANY EVIDENCE THAT THE FEES PAID TO QWEST BY DEX SHOULD BE HIGHER?

A. No, as I explained in my previous testimony, the fees paid by DEX are lower than they were in 1984 because there are fewer services provided under the current publishing agreement and because market conditions and legal decisions since the time of the Settlement Agreement have changed. No one has provided evidence in this case showing that the fees paid by DEX should have been higher.

Q. HAVE THE ADDITIONAL IMPUTATION AMOUNTS RECOMMENDED BEEN BASED ON THE VALUE OF THE SERVICES PROVIDED TO QWEST BY DEX?

A. No. Both Staff and RUCO relied on the presumptive $43 million less the actual fees received. They have provided no evidence that the value of the services provided by DEX to Qwest is different than set forth in my

prior testimony in this proceeding. The evidence they did present related to the profits of DEX and in substance was an attempt to circuitously rely upon the imputation methodology rejected by the Arizona Appellate Court. AT&T also relied on the profits of DEX, but made so many errors and erroneous assumptions that the amount as well as the basis for the imputation must be rejected.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC. A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES	)	DOCKET NO. T-01051B-99-0105

EXHIBITS OF

ANN KOEHLER-CHRISTENSEN

QWEST CORPORATION

AUGUST 21, 2000

NO COMPETING DIRECTORIES

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
1	BUCKEYE	GREATER SW VALLEY	NONE	NONE
2	CIRCLE CITY	WICKENBURG	NONE	NONE
3	GILA BEND	AJO	NONE	NONE
4	WICKENBURG	WICKENBURG	NONE	NONE
5	YARNELL	WICKENBURG	NONE	NONE

ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
1	GLOBE	GLOBE	SOUTH CTL ARIZONA	PDC
2	HAYDEN	GLOBE	SOUTH CTL ARIZONA	PDC
3	JOSEPH CITY	WINSLOW	NORTHEASTERN ARIZONA	PDC
4	MIAMI	GLOBE	SOUTH CTL ARIZONA	PDC
5	PAYSON	PAYSON	PAYSON	PDC
6	PIMA	SAFFORD	SOUTHEASTERN ARIZONA	PDC
7	SAFFORD	SAFFORD	SOUTHEASTERN ARIZONA	PDC
8	SUPERIOR	GLOBE	SOUTH CTL ARIZONA	PDC
9	WELLTON	YUMA	YUMA METRO	PDC
10	WHITLOW	GLOBE	SOUTH CTL ARIZONA	PDC
11	WINSLOW	WINSLOW	NORTHEASTERN ARIZONA	PDC
12	YUMA	YUMA	YUMA METRO	PDC

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
1	AGUA FRIA	PHOENIX	PHOENIX SPANISH	AAP
			GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG
2	ASH FORK	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC
3	BENSON	COCHISE COUNTY	DOUGLAS-BISBEE REG	PDC
			SIERRA VISTA	PDC
			SOUTHEASTERN ARIZONA	PDC
4	BISBEE	COCHISE COUNTY	DOUGLAS-BISBEE REG	PDC
			SIERRA VISTA	PDC
			SOUTHEASTERN ARIZONA	PDC

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
5	BLACK CANYON	PHOENIX	PHOENIX SPANISH	AAP
		GREATER NW VALLEY	GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG
6	CAMP VERDE	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC
7	CAVE CREEK	PHOENIX	PHOENIX SPANISH	AAP
		SCOTTSDALE	GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
8	CASA GRANDE	CASA GRANDE	CASA GRANDE	PDC
			SOUTH CTL ARIZONA	PDC
9	CHINO VALLEY	PRESCOTT	PRESCOTT	JHZ
			PRESCOTT	PDC
10	COOLIDGE	CASA GRANDE	CASA GRANDE	PDC
		GALLUP, NM	SOUTH CTL ARIZONA	PDC
11	COTTONWOOD	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC
12	CORONADO	TUCSON	TUCSON SPANISH	AAP
		TUCSON NORTH-NW	TUCSON REG	PC
			SOUTH CTL ARIZONA	PDC
			SUN CITY-VISO-SDLBK	SWG
13	DEER VALLEY	PHOENIX	PHOENIX SPANISH	AAP
		GREATER SW VALLEY	GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG
14	DOUGLAS	COCHISE COUNTY	DOUGLAS-BISBEE REG	PDC
			SIERRA VISTA	PDC
			SOUTHEASTERN ARIZONA	PDC

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
15	ELOY	CASA GRANDE	CASA GRANDE	PDC
			SOUTH CTL ARIZONA	PDC
16	FLAGSTAFF	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC
17	FLORENCE	CASA GRANDE	CASA GRANDE	PDC
			SOUTH CTL ARIZONA	PDC
18	FT MCDOWELL	PHOENIX	PHOENIX SPANISH	AAP
		SCOTTSDALE	GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG
19	GRAND CANYON	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC
20	GREEN VALLEY	NOGALES-GREEN VALLEY	NOGALES SANTA CRUZ	PDC
			GREEN VALLEY	SWG

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
21	HIGLEY	PHOENIX	PHOENIX SPANISH	AAP
		EAST VALLEY	GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG
22	HUMBOLDT	PRESCOTT	PRESCOTT	JHZ
			PRESCOTT	PDC
23	MARANA	TUCSON	TUCSON SPANISH	AAP
		TUCSON NORTH-NW	TUCSON REG	PC
			SOUTH CTL ARIZONA	PDC
			SUN CITY-VISO-SDLBK	SWG
24	MARICOPA	CASA GRANDE	CASA GRANDE	PDC
			SOUTH CTL ARIZONA	PDC
25	MUNDS PARK	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
26	NEW RIVER	PHOENIX	PHOENIX SPANISH	AAP
		GREATER NW VALLEY	GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG
27	NOGALES	NOGALES-GREEN VALLEY	NOGALES-SANTA CRUZ	PDC
			GREEN VALLEY	SWG
28	PAGE	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC
29	PATAGONIA	NOGALES-GREEN VALLEY	NOGALES SANTA CRUZ	PDC
			GREEN VALLEY	SWG

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
30	PHOENIX	PHOENIX	PHOENIX SPANISH	AAP
			GREATER MESA	NDC
			GREATER TEMPE	NDC
			PEORIA	NDC
			NORTH SCOTTSDALE	NDC
			SOUTH SCOTTSDALE	NDC
			GLENDALE-PHOENIX WEST	PDC
			SUN CITY WEST-PEORIA	PDC
			CAREFREE-CAVE CREEK	SD
			CHANDLER-GILBERT	SD
			FOUNTAIN HILLS	SD
			MESA	SD
			PARADISE VALLEY	SD
			SUN CITIES-PEORIA	SD
			TEMPE	SD
			AHWATUKEE	SWG
			SUN CITY-SUN CITY WEST	SWG
31	PRESCOTT	PRESCOTT	PRESCOTT	JHZ
			PRESCOTT	PDC
32	ROBLES	TUCSON	TUCSON SPANISH	AAP
			TUCSON REG	PC
			SOUTH CTL ARIZONA	PDC
			SUN CITY-VISO-SDLBK	SWG
33	SAN MANUEL	TUCSON NORTH-NW	TUCSON SPANISH	AAP
			TUCSON REG	PC
			SOUTH CTL ARIZONA	PDC
			SUN CITY-VISO-SDLBK	SWG
34	SEDONA	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC
35	SIERRA VISTA	COCHISE COUNTY	DOUGLAS-BISBEE REG	PDC
			SIERRA VISTA	PDC
			SOUTHEASTERN ARIZONA	PDC

MORE THAN ONE COMPETING DIRECTORY

	USWC EXCHANGE	DEX DIRECTORY (IES)	COMPETING DIRECTORIES	PUBLISHER
36	SUPERSTITION	EAST VALLEY	GREATER MESA	NDC
			GREATER TEMPE	NDC
			APACHE JUNCTION	PDC
			CASA GRANDE	PDC
			SOUTH CENTRAL AZ	PDC
			APACHE JUNCTION	SD
			CHANDLER-GILBERT	SD
			MESA	SD
			TEMPE	SD
			AHWATUKEE	SWG
37	TOMBSTONE	COCHISE COUNTY	DOUGLAS-BISBEE REG	PDC
			SIERRA VISTA	PDC
			SOUTHEASTERN ARIZONA	PDC
38	TUBAC	NOGALES-GREEN VALLEY	NOGALES SANTA CRUZ	PDC
			GREEN VALLEY	SWG
39	TUCSON	TUCSON	TUCSON SPANISH	AAP
		TUCSON EAST	TUCSON REG	PC
			SOUTH CTL ARIZONA	PDC
			SUN CITY-VISO-SDLBK	SWG
40	VAIL	TUCSON	TUCSON SPANISH	AAP
		TUCSON EAST	TUCSON REG	PC
			SOUTH CTL ARIZONA	PDC
			SUN CITY-VISO-SDLBK	SWG
41	WILLCOX	COCHISE COUNTY	DOUGLAS-BISBEE REG	PDC
			SIERRA VISTA	PDC
			SOUTHEASTERN ARIZONA	PDC
42	WILLIAMS	FLAGSTAFF	FLAGSTAFF	JHZ
			PAGE-LAKE POWELL	KI
			FLAGSTAFF	PDC
			PAGE LAKE POWELL	PDC
			NORTHEASTERN ARIZONA	PDC
			SEDONA-VERDE VALLEY	PDC

Publisher Key

AAP	Anaya Associated Publishers, Inc.	
JHZ	J. H. Zerbey Newspapers, Inc.	
KI	Kiwi Publishing Co., Inc.	
NDC	National Directory Company	
PC	Pacific Coast Publishing	Note: Recently purchased by WorldPages.com
PDC	Phone Directories Company	
SD	Southern Directory Co., Inc.	
SWG	Southwestern Bell Advertising Group, Inc.	

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC., A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	DOCKET NO. T-1051B-99-105 AFFIDAVIT OF ANN KOEHLER-CHRISTENSEN
STATE OF WASHINGTON	)	ss
COUNTY OF KING	)	

Ann Koehler-Christensen, of lawful age being first duly sworn, depose and states:

1 My name is Ann Koehler-Christensen. I am Finance Analyst – Regulatory Finance of Qwest Corporation in Seattle, Washington. I have caused to be filed written testimony and exhibits in support of USWC in Docket No. T-01051B-99-0105

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Ann Koehler-Christensen

SUBSCRIBED AND SWORN to before me this 18th day of August, 2000.

Notary Public residing at
Seattle, Washington.

My Commission Expires: 4-13-03

BEFORE THE

ARIZONA CORPORATION COMMISSION

EXHIBIT
Q-26
Admitted

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC. A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES	)	DOCKET NO. T-01051B-99-0105

REBUTTAL TESTIMONY OF

SCOTT A. MCINTYRE

QWEST CORPORATION

AUGUST 21, 2000

REBUTTAL TESTIMONY OF SCOTT A. MCINTYRE

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EXECUTIVE SUMMARY

My rebuttal testimony will address issues raised by Arleen Starr for AT&T, William Dunkel for the Commission Staff, Lee L. Selwyn for AT&T and Michael J. Ileo, Ph.D., representing the Arizona Payphone Association. These witnesses address issues concerning switched access, private line, Public Access Lines and the deregulation of high capacity services, as proposed by Qwest in this rate case.

AT&T supports switched access reductions, but wants prices to be reduced to cost. Mr. Dunkel, for the Staff, does not see the need to reduce switched access at all. Harry M. Shooshan III has proposed access reductions in the context of a price regulation plan as an alternative to rate of return regulation. This plan will be discussed by other Qwest witnesses in the context of alternative regulation. Qwest believes some reductions in switched access are reasonable, but significant reductions are only appropriate in the context of rate rebalancing or universal service funding.

Staff contends that private line rates should be increased, but to a much larger degree than Qwest supports. Qwest believes that some rebalancing of private line pricing is appropriate, but the level suggested by Mr. Dunkel would create significant rate shock to customers and these rates would not be sustainable in the competitive private line marketplace.

Mr. Lee L. Selwyn, for AT&T takes issue with Qwest's position that high capacity services are competitive and contends that these services should not be

deregulated. Qwest maintains that these services are already offered in competitive tariffs and that as long as pricing flexibility already exists, deregulation is appropriate to level the competitive playing field.

Dr. Ileo, for the Arizona Payphone Association asserts that Public Access Line (PAL) rates do not conform to the FCC New Services Test, are priced too high, and contain subsidies that should be removed. This would reduce the price of PAL services dramatically. Qwest believes the PAL rate in effect at the beginning of this case ($42.31) is reasonable, meets the FCC new services test and should be approved by the Commission in this rate case. The proposal from the APA amounts to a request for preferential treatment that cannot be justified.

IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND PLACE OF EMPLOYMENT.

A. My name is Scott A. McIntyre. I work for Qwest Corporation ("Qwest", or "Company") (formerly known as U S WEST Communications, Inc.) My title is Director – Product and Market Issues. My responsibilities include developing markets and prices strategies for Qwest and supporting these positions in the regulatory arena. My business address is 1600 7th Avenue, Room 3009, Seattle, Washington 98191.

Q. ARE YOU THE SAME SCOTT A. MCINTYRE WHO FILED SUPPLEMENTAL TESTIMONY IN THIS CASE?

A. Yes, I am.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to address and clarify certain issues raised by AT&T witness, Arleen M. Starr and AT&T witness Lee L. Selwyn. I will also rebut testimony offered by William Dunkel on behalf of the Staff of the Arizona Corporation Commission and Dr. Michael J. Ileo on behalf of the Arizona Payphone Association. While the testimony of these witnesses deals with several issues, I will focus my rebuttal on the

topics of switched access, private line, Public Access Lines (PAL) and the deregulation of high capacity services.

SWITCHED ACCESS SERVICE

Q. WHAT IS YOUR UNDERSTANDING OF AT&T'S POSITION ON SWITCHED ACCESS AS OFFERED BY AT&T WITNESS ARLEEN STARR?

A. AT&T agrees with Qwest that switched access is a source of support for basic exchange services. AT&T also agrees with Qwest, that the cost of the loop should be supported by the end user, not the interexchange carriers who provide long distance services. AT&T's position departs from Qwest's however, in that AT&T believes that switched access prices should be set at cost.

Q. DO YOU AGREE THAT ACCESS PRICES SHOULD BE SET AT COST?

A. No, absolutely not. This would not only eliminate any support for basic exchange services; it also would eliminate any contribution to the running of the business. In a sense, this would reverse the subsidy to the benefit of the interexchange carriers.

Q. ARE THE CARRIERS REQUIRED TO PASS ALONG SWITCHED ACCESS RATE REDUCTIONS TO CUSTOMERS?

A. Generally, no, however Ms. Starr has asserted that AT&T would abide by the provision in its tariff for the Access Cost Adjustor Mechanism (ACAM).

1 This mechanism was ordered by the Commission in 1988, but it affects
2 only AT&T. End users may or may not see any benefits of reduced
3 access charges to other carriers.
4
5 **Q. CAN THE COMMISSION FORCE SWITCHED ACCESS REDUCTIONS**
6 **TO BE PASSED ON TO END USERS?**
7 A. It would seem to be a reasonable part of any switched access reduction
8 order, however I'm not sure how this would be accomplished.
9
10 **Q. IF PART OF THE REVENUE REQUIREMENT IN ARIZONA IS SHIFTED**
11 **FROM SWITCHED ACCESS, PAID BY THE CARRIERS, TO THE END**
12 **USERS AS PART OF THEIR BASIC RATES, WHO BENEFITS THE**
13 **MOST?**
14 A. It is difficult to be sure. Clearly, the carriers benefit immediately from the
15 reduced cost of switched access. Qwest would receive the revenue from
16 a different source and therefore remain relatively neutral. The end user
17 may see a reduction in toll charges that may offset, on average, part of the
18 increase in their basic rates. Those who use more toll services will benefit
19 more than those who use less. Depending on how (and if) carriers pass
20 on these reductions to end users, it may be less than a dollar for dollar
21 benefit.
22
23 **Q WHY DOES ANY SHIFT HAVE TO OCCUR AT ALL?**
24 A. The shift has to occur because of the prospect of competitive bypass.
25 Carriers can and do bypass switched access in a number of ways and it

means that the high margins that exist in switched access cannot be sustained over time. As these services are bypassed, switched access revenues will be reduced and the economic support for basic exchange service will erode anyway. This makes the managed reduction of switched access rates necessary through rate rebalancing and possibly through state universal service funding.

Q. HOW ARE SWITCHED ACCESS RATES BYPASSED?

A. Switched access can be bypassed by use of direct connections from the carriers to the end users. Carriers can construct their own facilities, purchase private lines from Qwest, or purchase facilities from some other provider. These private lines used to connect customers directly with carriers are also known as special access.

Q. PLEASE EXPLAIN HOW THIS BYPASS WORKS.

A. A direct circuit from the end user to a carrier Point of Presence (POP) bypasses any switching or switched access transport provided by Qwest. This circuit carries the toll traffic to the carrier and is billed on a flat rate basis instead of the per-minute basis charged for switched access. As long as the customer uses enough toll to justify the dedicated circuit, the carrier saves the switched access charges and passes some of these savings along to the customer in the form of reduced toll charges.

Q. IN HIS TESTIMONY FOR STAFF, MR. DUNKEL STATES THAT THIS WORKS ONLY FOR EXTREMELY HIGH TOLL USERS. IS THIS A TRUE CHARACTERIZATION?

A. No, not at all. Let's take the example of a DS1 private line. A DS1 carries 24 channels of voice traffic. A typical DS1 is priced about $250 per month including the termination of the circuit and some interoffice transport mileage. During an 8-hour workday, this circuit can carry over 250,000 minutes of toll traffic. This equates to an effective cost of less than 1/10 of one cent per minute. This means that switched access costs are almost completely eliminated from the equation. Any customer who generates more than $250 per month of toll, and many customers do, is an excellent target for such bypass.

Q. BUT, DO MANY RESIDENTIAL CUSTOMERS GENERATE THIS KIND OF TOLL TRAFFIC?

A. No, the average residential customer does not generate this level of traffic, but many business customers do. These business customers are the targets for such bypass and this lowers the carrier's average cost per minute of use dramatically. Large volume business customers account for more than their average share of toll revenues. For example, 2% of the business customers might generate as much as 40% of the revenue. This makes these high volume customers very desirable.

Q. IN THIS SCENARIO, DOESN'T QWEST STILL GET THE REVENUE FOR PRIVATE LINES?

A. Yes. However, in this case, Qwest would receive $250 per month for the DS1 instead of over $11,000 per month in switched access revenue. This $11,000 is what Qwest would receive from 253,000 minutes carried by the DS1 at $.045 (4.5 cents) per minute for originating or terminating toll traffic.

Q. MR. DUNKEL ASSERTS THAT ALL OF THE PRIVATE LINE BYPASS THAT WILL OCCUR HAS ALREADY OCCURRED. DO YOU AGREE?

A. No. There are at least four key reasons why this is not true.

First, pricing pressure on private line services, especially at the high capacity level, continues to be downward. These services continue to drop in price and therefore the threshold for bypass gets lower.

Second, consumer usage of toll services continues to grow. This means more and more customers are reaching the level where this type of bypass is viable.

Third, the competition for reduced toll rates is significant. Carriers are offering $.05 per minute rates and they need to get their costs down to accommodate these rates. Private lines that can provide traffic costs as low as $.001 per minute are a viable alternative that continues to get more viable as rates are driven lower.

1 Fourth, as customers become more aware of their options in
2 telecommunications, they will ask for such "deals" from carriers and this
3 will increase the bypass opportunities.
4
5 **Q. MS. STARR ASSERTS THAT THE TELECOMMUNICATIONS ACT OF**
6 **1996 REQUIRES ACCESS SERVICES TO BE PRICED AT FORWARD**
7 **LOOKING ECONOMIC COST. IS THIS YOUR UNDERSTANDING?**
8 A. Absolutely not. There is no requirement of the sort. The Act requires
9 service to be cost based and may include a reasonable profit. Based on
10 cost does not mean equal to cost by any definition. This says that prices
11 must have a relationship to their underlying cost plus a reasonable profit.
12 In this case, Arizona public policy makers have a role in deciding what is
13 reasonable. Dr. Taylor discusses this topic in detail in his rebuttal
14 testimony filed in this case.
15
16 **Q. MS. STARR ALSO ASSERTS THAT REDUCING SWITCHED ACCESS**
17 **RATES WILL TRIGGER INCREASED COMPETITION FOR TOLL**
18 **SERVICE. DO YOU AGREE?**
19 A. I believe the competition for toll services is pretty robust right now. All
20 carriers pay the same access charges to Qwest and all carriers have the
21 same alternatives available. Reducing rates will affect all carriers equally,
22 so I can't see how competition will be stimulated by reducing these rates.
23
24 **Q. DOES AT&T COMPETE WITH QWEST FOR TOLL SERVICES IN**
25 **ARIZONA?**

A. Only for IntraLATA toll service. Qwest is prohibited from offering InterLATA toll. InterLATA toll consists of interLATA -intrastate and interstate toll calling, which is the bulk of the long distance business.

Q. IS THERE A SEPARATE PROCEEDING DEALING WITH THE ENTRY OF QWEST INTO THE INTERLATA TOLL MARKET?

A. Yes, this proceeding is Docket T-00000B-97-0238 and it will determine how and when Qwest may enter this market.

Q. HAS QWEST PROPOSED SWITCHED ACCESS RATE REDUCTIONS IN THIS RATE CASE PROCEEDING?

A. Yes. Qwest has proposed some restructure of local transport rates including the addition of new rate elements. We have also proposed reductions in the Interconnection Charge (IC). This results in an overall reduction in revenues of $5 M.

Q. DOES AT&T APPEAR TO SUPPORT THE STRUCTURAL CHANGES FOR LOCAL TRANSPORT THAT QWEST HAS PROPOSED?

A. Yes, although Ms. Starr adds a caveat that prices should be lowered to cost as well.

Q. DOES MR. DUNKEL, FOR THE STAFF, SUPPORT THE PROPOSED TRANSPORT CHANGES?

A. Yes, however Mr. Dunkel wants the changes to be revenue neutral, with no revenue reduction.

Q. ARE THE RATES PROPOSED BY QWEST THE SAME AS THOSE IN THE FCC ENVIRONMENT?

A. Not exactly, and for a couple of good reasons. First, the FCC rates are not set with a rate of return philosophy. The FCC uses a price cap system where prices reside in "buckets" of rates that are capped on a total bucket basis. This means that various rates within the buckets are adjusted annually through complicated methods that can, over time, cause some prices to drift from their underlying cost structure. This creates prices that don't always fit well in a rate of return environment. Second, the FCC structure also contains an End User Common Line charge (EUCL), that is charged to end users. This means that while the switching and transport rates charged to carriers may appear lower than some state rates, the total charge to end users is higher than it may seem. The EUCL is currently set at $4.35 for single line residence and business customers. If you average this charge over typical end user toll volumes, it equates to about 2 cents per minute. Currently in Arizona, rates for switched access are certainly higher, in aggregate, than the FCC rates, but not as high, from an end user perspective, as it may appear.

Q. MS. STARR CLAIMS THAT THE FACT THAT QWEST IS PROPOSING SLIGHT INCREASES FOR DS1 AND DS3 ENTRANCE FACILITIES IS EVIDENCE THAT THESE SERVICES ARE NOT COMPETITIVE. WOULD YOU COMMENT ON THIS?

A. The proposed changes to the local transport component of switched access constitute some restructure and addition of new elements. The overall impact is a reduction of total switched access revenues of $5 M. It is true that there are components that increased, but this was done to mirror existing rates in the FCC environment. Ms. Starr has argued that state rates differ from FCC rates, but in this case we proposed making them the same. These DS1 and DS3 rates have been proposed to equal the FCC private line rates for these services. Private lines are substitutable for switched access entrance facilities so it made sense to make them equal. The fact that prices for specific elements within a category of services vary, up or down is not evidence of anything. Prices in competitive markets fluctuate.

Q. DOES THE STAFF TAKE A POSITION ON WHETHER INCREASING PRICES FOR SOME RATE ELEMENTS ARGUES AGAINST THE COMPETITIVE NATURE OF THE SERVICE?

A. It appears that Mr. Dunkel does not believe there is a direct connection. Mr. Dunkel states "It is reasonable to expect that the majority of private line revenues are in the category that the Commission has classified as competitive." Mr. Dunkel proposes that private line rates may be raised by as much as $21.6M (44%) and makes no claim that this would change their competitive nature. Competition means there are reasonable alternatives. It does not mean prices are not subject to some variations.

Q. WOULD YOU SUMMARIZE YOUR UNDERSTANDING OF MR. DUNKEL'S POSITION ON SWITCHED ACCESS SERVICE?

A. Mr. Dunkel states that current switched access price levels are fine. He supports the restructure of rates as proposed by Qwest, but he wants it done in a revenue neutral manner. Mr. Dunkel states that it is appropriate that switched access share the cost of the loop because toll traffic is carried over the loop. He does not agree with the FCC, AT&T, other Interexchange carriers, Qwest, and many regulatory bodies that the non-traffic sensitive cost of the loop should be borne by the local ratepayer as the user and beneficiary of the traffic on the loop.

Q. SO, WHERE DOES QWEST STAND RELATIVE TO THE TWO EXTREMES PRESENTED BY MR. DUNKEL AND AT&T?

A. Qwest stands between the two extremes. It is Qwest's position that switched access rates do, indeed, subsidize basic exchange rates. There needs to be some downward adjustment of switched access as the cost burden is justifiably shifted toward the end user. Taking these rates to cost, however, as AT&T suggests, is ridiculous, cannot be justified, and shifts the benefit heavily toward the carriers.

SWITCHED ACCESS SUMMARY

Q. WOULD YOU PLEASE STATE QWEST'S POSITION ON SWITCHED ACCESS PRICING?

A. Qwest believes that switched access is certainly a source of revenue support for basic exchange services. We believe this support is not sustainable in the long run and that implicit subsidies need to be eliminated. This can be accomplished by raising all services to prices above cost or, at least replacing the implicit subsidies with explicit subsidies that can be dealt with in a straightforward manner. In general, subsidies do not work well in a competitive environment where artificially high margins invite more competition than might normally exist and subsidized services may thwart competitive entry.

For switched access in Arizona, this means some reduction in overall rates. In the context of rate rebalancing, switched access is one of the key places to look for revenue reductions. The Carrier Common Line Charge (CCL) should be reduced and possibly eliminated if residential rates are increased or offset with some universal service fund. We originally proposed a switched access reduction of $5.0 M, and this still seems reasonable in the context of the other prices being proposed in this case. However, if additional rate rebalancing is desired, or if universal service funding is established, we would propose further rate reductions to coincide with those adjustments.

HIGH CAPACITY DEREGULATION

Q. HAS ANYONE SUBMITTED TESTIMONY IN THIS CASE CONCERNING THE DEREGULATION OF HIGH CAPACITY SERVICES?

A. Yes, Lee L. Selwyn has submitted testimony on behalf of AT&T that states that high capacity services should not be deregulated.

Q. WHAT IS THE BASIS FOR MR. SELWYN'S ARGUEMENT?

A. He claims that Qwest has not proven that these services are competitive.

Q. DID QWEST INTRODUCE EVIDENCE AS TO THE STATE OF COMPETITION WITH RESPECT TO THESE SERVICES?

A. Yes. We have offered some evidence of competition, but that is not the key element of our proposal. These services are already offered under competitive tariffs in Arizona, and Qwest already has pricing flexibility for these services. Mr. Dunkel, for the Staff agrees that private line services are competitive. Qwest bears a regulatory burden however, that our competitors do not carry. The attempt here is to level the playing field on these competitive services so Qwest may compete on equal footing. There are methods and procedures in a regulated environment that take time and money to manage. This creates a cost of business that our competitors do not have to cover. Since most discussions about competition focus on pricing, and Qwest already has pricing flexibility for these services, it seems reasonable that we should have procedural flexibility, as does our competition.

Q. ARE HIGH CAPACITY SERVICES CURRENTLY OFFERED IN COMPETITIVE TARIFFS IN ARIZONA?

A. Yes. DS1 and DS3 private line services are found in the Arizona Competitive Private Line Transport Services Tariff. ATM Cell Relay Service, Frame Relay Service, Transparent LAN Service, and Megabit Service are all found in the Competitive Advanced Communications Services Tariff.

Q. CAN CUSTOMERS BUY HIGH CAPACITY SERVICES UNDER EITHER THE STATE OR FCC JURISDICTION?

A. Yes. For switched access transport services that carry both interLATA and intraLATA traffic, the percentage of use for each category determines what percentage of the circuit is charged out of the FCC tariff and what percentage is charged out of the state tariff. For private line circuits there is a threshold to determine jurisdiction. InterLATA circuits, or circuits that carry at least 10% interLATA traffic are supposed to be purchased out of the FCC tariff. The customer is the only one who really knows what traffic is being carried on these circuits so there is the possibility that circuits are ordered from the wrong tariff or price list. Since these circuits are virtually the same, Qwest attempts to keep pricing similar wherever possible. Regulations in different jurisdictions make this difficult, but we try to minimize "tariff shopping" when we can.

Q. DO THESE SERVICES HAVE PRICING FLEXIBILITY UNDER THE FCC TARIFF?

A. There is some pricing flexibility under price cap rules, within the "buckets" of services. There is no general pricing freedom at this time, however.

Q. IS QWEST PURSUING PRICING FREEDOM UNDER THE RECENT FCC PRICING FLEXIBILITY ORDER?

A. We are currently evaluating our position concerning this order and we are gathering some data. We have not yet determined how we will proceed.

Q. WHEN THE FCC DENIED QWEST'S PETITION FOR FOREBEARANCE, DID QWEST PURSUE ANY AVENUE TO TAKE ISSUE WITH THE FCC'S ORDER?

A. No, we believe we will be able to achieve the pricing flexibility we need under the provisions of the Pricing Flexibility Order. We have not yet proceeded along this path, however.

Q. ARE THE SERVICES IN QUESTION PREDOMINANTLY PURCHASED OUT OF THE FCC TARIFF?

A. Yes, most of the traffic carried by these services is "contaminated" with interLATA traffic, therefore under FCC rules, these circuits must be purchased under FCC jurisdiction.

Q. IF CUSTOMERS HAVE THE OPTION OF PURCHASING THESE SERVICES FROM THE FCC TARIFF, DO THE FCC RATES SET A STANDARD FOR PRICING OF THESE SERVICES?

A. Yes, intraLATA prices that are higher than FCC rates do not attract much business. IntraLATA services, out of state price lists, catalogs, or tariffs must be priced the same or lower in order to be viable.

Q. DO STATE RATES ALWAYS MATCH EXACTLY WITH FCC RATES?

A. No, as I mentioned earlier, the FCC has specific procedures on pricing that may not match up well with cost structures and these rates may change as often as every year. These variables tend to keep prices similar but not exactly the same.

Q. WHY DO CUSTOMERS BUY THESE SERVICES ON A STATE (INTRALATA) BASIS AT ALL?

A. The FCC tariff is rigid on its pricing and the terms and conditions offered. If customers can configure their networks to justify intraLATA services under state jurisdiction, we can sometimes offer different terms or conditions than are available under FCC jurisdiction. This may mean a different contract term, some flexibility on converting from other services, or some rate protection that is not available under FCC terms.

Q. DOES THIS MEAN THAT WHILE THE FCC TARIFF IS AN ALTERNATIVE FOR THESE SERVICES, CUSTOMERS CAN SOMETIMES GET A BETTER DEAL BY USING INTRALATA SERVICES?

A. Yes, if these services fit their network configuration.

Q. DOES MR. DUNKEL, FOR THE COMMISSION STAFF, TAKE A POSITION ON THIS DEREGULATION?

A. He does not address it directly, however part of his discussion about private line services seems to support the concept. Mr. Dunkel has determined that the revenue requirement for private line services is $70.9 M. Rates for private line produced $49.3 M during the 1999 test year and this created a shortfall of $21.6 M. Mr. Dunkel suggests that the Commission authorize an increase in private line revenues to account for this shortfall because he does not want this $21.6 M in competitive revenue shortfall to be covered by other ratepayers of non-competitive services. Mr. Dunkel also suggests that such an increase in rates may not be sustainable in a competitive market and it would be up to Qwest management to decide if such a risk should be taken.

This suggests that if private line were deregulated and the revenue requirement, as well as the actual revenue, were taken out of the rate base, the Commission would not have to worry whether this revenue shortfall was covered by other customers. With the service deregulated, revenue requirements, revenue actuals and even costs could be removed from revenue requirement calculations and the risk of such a pricing shortfall would be Qwest's alone to manage.

Q. WHAT ABOUT THE OTHER SERVICES PROPOSED FOR DEREGULATION BY QWEST?

A. Generally, Frame Relay, ATM Cell relay, Transparent LAN Service, and Megabit Service are considered by most people to be less essential and more competitive than private line services. If Mr. Dunkel has the revenue

requirement concern about private line, it seems he would be even more supportive of deregulation for these other services.

SUMMARY POSITION ON HIGH CAPACITY SERVICE DEREGULATION

Q. PLEASE SUMMARIZE QWEST'S POSITION ON THE DEREGULATION OF HIGH CAPACITY SERVICES AS PROPOSED BY QWEST IN THIS PROCEEDING.

A. Qwest already has pricing flexibility for the services proposed for deregulation. The current competitive tariffs allow for pricing up to maximum level or individual case basis pricing. These services have been priced in this way for many years or in some cases from the inception of the service. These services are offered by other providers and are offered by Qwest under jurisdiction of the FCC. Qwest is proposing deregulation to level the playing field with our competitors, not for pricing freedom, which we already have, but for relief from the procedures and costs surrounding regulation. Other providers of these services do not carry the burden of regulatory procedure and Qwest expects the same competitive conditions to apply to all providers of service.

PUBLIC ACCESS LINE (PAL) SERVICE

Q. HAS ANY OTHER PARTY SUBMITTED TESTIMONY IN THIS CASE THAT YOU WOULD LIKE TO DISCUSS?

A. Yes, Michael J. Ileo, Ph.D. has submitted testimony of behalf of the Arizona Payphone Association on the subject of Public Access Lines. Other Qwest witnesses will also address issues raised by Dr. Ileo. I will specifically address proposed rates and why these rates are reasonable.

Q. WHAT IS PUBLIC ACCESS LINE SERVICE?

A. Public Access Line (PAL) Service provides basic exchange access for use by a Payphone Service Provider (PSP) to connect pay telephones (payphones) to Qwest switched network. Payphones are placed at locations, accessible to the public, as determined by the owner of the property. The PAL service connects the payphone to the network so that users of the payphone can place local and long distance calls.

Q. WHAT TYPES OF PAL SERVICES ARE AVAILABLE TO PAYPHONE SERVICE PROVIDERS IN ARIZONA?

A. There are two types, Basic PAL and Smart PAL. Basic PAL Service provides a voice grade line designed for use with a "smart" payphone set which performs its own coin control functions. The second type, Smart PAL, is designed for use with a "dumb" payphone set which cannot perform its own coin control functions. With Smart PAL, coin control functions are performed by Qwest's central office. Both Basic and Smart PAL are available with usage-sensitive local calling or with unlimited local calling for a flat monthly rate.

Q. WHAT IS YOUR UNDERSTANDING OF DR. ILEO'S MAIN CONCERNS ABOUT PAL RATES?

A. Dr. Ileo discusses many cost and price issues that will be addressed by Dr. William E. Taylor and Jerrold L. Thompson on behalf of Qwest. I will briefly address the FCC New Services Test, and I will discuss the reasonableness of Qwest's PAL rates which is relevant to the reasonable contribution allowed by the FCC.

FCC NEW SERVICES TEST

Q. PLEASE EXPLAIN THE FCC'S NEW SERVICES PRICE TEST?

A. The "new services" price test, as set forth in 47 C.F.R. Section 61.49(g)(2), is a benchmark that must be met when the Company files a federal tariff for a new service. Under that test, each service must be priced above cost, and each service must include no more than a reasonable level of contribution.

Q. WHAT IS THE PURPOSE OF THE FCC'S NEW SERVICES PRICE TEST?

A. Based on statements made in its orders, the FCC developed the new services price test to provide a flexible pricing guideline that guards against predatory, excessive and discriminatory pricing. The FCC's rules accomplish this by requiring a cost basis for both lower and upper price bounds, thus guarding against pricing that is either too low or too high. In developing its pricing rules for new services, the FCC recognized the need

for contribution levels in the prices that would give LECs incentive to innovate and develop still more new services.

Q. HAS THE FCC DEFINED A SPECIFIC COST OR LEVEL OF CONTRIBUTION THAT MUST BE USED TO SET THE PRICE UNDER THE NEW SERVICES PRICE TEST?

A. No. The FCC states, "once the direct costs have been identified, LECs will add an appropriate level of overhead costs to derive the overall price of the new service. To provide the flexibility needed to achieve efficient pricing, we are not mandating uniform loading, but BOCs will be expected to justify the loading methodology they select as well as any deviations from it."[1]

Q. WHAT DO YOU BELIEVE THE FCC MEANT BY THE ABOVE STATEMENT?

A. It is clear that the FCC was rejecting the concept of uniform loadings — a consistent percentage markup over direct costs -- and that it would expect the LECs' filings to have various loadings on various products and services. The FCC meant that flexibility is needed, and uniform loadings would not promote efficient pricing and innovation.

Q. WHAT COST BASIS DOES QWEST USE WITH NEW SERVICE FILINGS BEFORE THE FCC?

[1] CC Docket Nos. 89-79 and 87-313. Report and Order and Order on Further Reconsideration & Supplemental Notice of Proposed Rulemaking. Adopted June 13, 1991. Paragraph 44.

A. When Qwest files new service filings with the FCC, the Company files work papers to support Total Long Run Incremental (TSLRIC) and Shared Costs. TSLRIC plus Shared Costs together form direct costs per the FCC's definition.

Q. DO QWEST FILINGS BEFORE THE FCC INCLUDE A PRICE/COST RATIO FOR THE NEW SERVICE?

A. Yes. Included in the workpapers is a price/cost ratio which is derived by taking the price that Qwest is proposing and dividing it by the direct costs.

Q. ARE YOU AWARE OF ANY FCC ORDERS THAT SPECIFY WHAT A REASONABLE PORTION OF OVERHEAD COSTS MIGHT BE AS THEY RELATE TO PAYPHONE SERVICES?

A. Yes. In its review and approval of another Bell Operating Company's pricing, the FCC stated, "Bell Atlantic's ratio of rates to direct costs for pay phone features range from a low of zero times greater than the direct cost to a high of 3.4 times greater than the direct costs, while the ratio of rates to direct costs for the payphone features offered by other LECs ranges from a low of zero times greater than the direct costs to a high of 4.8 times greater than the direct costs."[2]

Q. WHAT ACTIONS DID QWEST TAKE REGARDING ITS PAL SERVICES AS A RESULT OF THESE FCC DIRECTIVES?

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[2] CC Docket 97-140, Memorandum Opinion and Order, released October 29, 1997, at paragraph 13

A. Qwest filed its Smart PAL tariffs in the states, including in Arizona. Qwest analyzed its prices for all of its PAL services, both Smart PAL and Basic PAL, in accordance with the new services test. The Company's review showed all of the Arizona PAL prices to be in compliance with the test. On May 20, 1997, Qwest issued its certification letter, certifying its compliance with all FCC payphone deregulation requirements in a number of states, including Arizona.

Q. YOU HAVE TESTIFIED THAT QWEST HAS CERTIFIED THAT IT HAS FULLY COMPLIED WITH THE FCC'S PAYPHONE DEREGULATION REQUIREMENTS. HOW DID QWEST DETERMINE THAT ITS ARIZONA PAL PRICES MET THE FCC'S REQUIREMENTS?

A. Qwest performed the new services test on the Arizona Smart PAL and Basic PAL prices, using its current TSLRIC studies. Those analyses are attached to my testimony as proprietary Exhibit SAM-1.

Q. DO THE EXISTING AND PROPOSED PRICES OF QWEST'S BASIC AND SMART PAL FALL WITHIN THE RANGE OF RATES ACCEPTABLE UNDER THE NEW SERVICES PRICE TEST?

A. Yes. Proprietary Exhibit SAM-1 examines the proposed rates for PAL services. This demonstrates that, using TSLRIC plus Shared Costs as the floor for pricing purposes, average monthly revenue exceeds the average monthly cost and allows for a reasonable contribution. In other words, the prices are cost-based and the price/cost ratios are well within the range that has been determined to be acceptable before the FCC. Since the

current PAL rates are lower than the proposed rates, the price to cost ratios would be even lower.

QWEST'S PAL PRICES ARE JUST AND REASONABLE

Q. IN THE PAST HAVE QWEST'S BASIC PAL PRICES BEEN FOUND BY THE COMMISSION TO BE JUST AND REASONABLE?

A. Yes. When Basic PAL prices were adjusted in the previous rate case, the Commission approved the proposed prices, noting that they were unopposed.[3] At this time, the price of flat-rated full-resale Basic PAL was set at $65.40. The Commission found, "The rates and charges for telecommunications services established hereinafter are just and reasonable."[4]

Later, when the price was reduced to $42.00 as a result of the settlement agreement between Qwest and APA, the Commission approved the new price, saying, "the tariff is reasonable, fair and equitable, and is therefore in the public interest."[5]

Finally, when the 31-cent increase was applied as a result of the Court Remand of the rate case, the Commission ordered the increase, saying, "The rates and charges authorized hereinbelow for the provision of telecommunication service comply with Decision No. 58927 and the

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[3] Docket No. E-1051-93-183, Decision No. 58927, at pp. 89-90.

[4] Id., Conclusions of Law No. 5, at p. 131.

[5] Docket No. E-1051-96-234, Decision No. 59641, Conclusion of Law No. 4, at p. 2.

Court's subsequent direction and as such should be adopted."[6] The referenced decision is the original rate case order in which the PAL rates were found to be just and reasonable at $65.40.

Q. WHAT RATES ARE CURRENTLY IN EFFECT FOR PAL SERVICES?

A. The current rate for basic PAL service is $32.78. A reduction from $42.31 was ordered by the Commission in Docket E-1051-97-024.

Q. DO YOU BELIEVE THE $42.31 RATE TO BE REASONABLE?

A. Yes, as did the Commission when the rate was established. The $42.31 rate is above cost, contributes to the operating costs of the business, and contributes to the revenue requirements established by the Commission. Any rate below this level will require other services to be priced higher to maintain the proper revenue requirement. Certainly the Commission may choose to generate this revenue from another source, but this is a fair rate for this service and all competitors are on equal footing.

Q. IS THERE A RATE YOU WOULD CONSIDER TO BE AT THE BOTTOM END OF THE REASONABILITY SCALE?

A. Yes. I consider a rate equal to the flat business rate to be as low as this service could reasonably be priced. The flat business rate is the basic rate that any business pays for its basic connection to the network. It is not reasonable that payphone service providers contribute to Qwest's operating costs any less than other businesses do. This is a cost of

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[6] Docket No. E-1051-93-183, Decision No. 59826, Conclusion of Law No. 5, at p. 7.

operation for many types of business customers and it should be the absolute price floor for PAL services as well.

Q. SHOULD THE PRICE/COST RELATIONSHIP BE THE SAME FOR SMART PAL AS IT IS FOR BASIC PAL?

A. Yes. This relationship is important in order to maintain competitive neutrality between payphone providers. At this point in the development of the payphone industry, Independent Payphone Providers use smart payphone sets almost exclusively, and Qwest has generally used dumb payphone sets. Thus, it is important to keep the price/cost relationship the same on both PAL services so that the difference between the Basic PAL price and the Smart PAL price is strictly driven by costs.

CONCLUSIONS AND RECOMMENDATIONS ON PAL

Q. PLEASE STATE YOUR CONCLUSIONS CONCERNING THE APA'S POSITION ON PAL SERVICE.

A. As also discussed by Dr. Taylor, in his testimony submitted on behalf of Qwest, a wide range of prices satisfy the FCC New Services Test and rates from the current $32.78 to the previous $42.31 fall in this category. The Commission Staff has supported even higher rates in the past and none have been deemed unreasonable in a regulated context. The APA merely wants lower rates. This is understandable, but not justifiable compared to what other businesses must pay for service. The APA

1 expects preferential treatment but has offered no reason why they should
2 receive rates supported by other ratepayers.
3
4 **Q. WHAT DO YOU RECOMMEND TO THE COMMISSION CONCERNING**
5 **PAL RATES?**
6 A. I recommend that the Commission approve Qwest's original proposal to
7 eliminate two obsolete PAL options, reject APA's challenge to the Basic
8 PAL prices and reestablish the $42.78 rate which is under appeal at this
9 time.
10
11 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**
12 A. Yes, it does.

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF U S WEST COMMUNICATIONS, INC. A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON AND TO APPROVE RATE SCHEDULES	)	DOCKET NO. T-01051B-99-0105

EXHIBITS OF

SCOTT A. MCINTYRE

QWEST CORPORATION

AUGUST 21, 2000

INDEX OF EXHIBITS

DESCRIPTION	EXHIBIT
New Services Price Test Analysis (PROPRIETARY)	SAM-1

QWEST CORPORATION

NEW SERVICES PRICE TEST ANALYSIS

Smart PAL & Basic PAL Flat Rated

	Costs are TSLRIC+SC	U S WEST Tariff Basic PAL	U S WEST Tariff Smart PAL
1.	Flat Cost	Redacted	Redacted
2.	Flat Rate (per tariff)	$ 42.31	$ 46.58
3.	Zone Chgs (Note 1)	$ 0.10	$ 0.10
4.	EUCL (July '00)	$ 4.35	$ 4.35
5.	Total Rate (2+3+4)	$ 46.76	$ 51.03
6.	**Rate divided by Cost (5/1)**	Redacted	Redacted

Note 1: Weighted average Zone charges.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF QWEST CORPORATION (FORMERLY KNOWN AS U S WEST COMMUNICATIONS, INC.), A COLORADO CORPORATION, FOR A HEARING TO DETERMINE THE EARNINGS OF THE COMPANY, THE FAIR VALUE OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, AND TO APPPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	)	**DOCKET NO. T-1051B-99-105**
	)	**AFFIDAVIT OF SCOTT A. MCINTYRE**
	):	**ss**
STATE OF WASHINGTON	)	
COUNTY OF KING	)	

Scott A. McIntyre, of lawful age being first duly sworn, depose and states:

1. My name is Scott A. McIntyre. I am Director – Product and Market Issues, of Qwest Corporation (formerly known as U S WEST Communications, Inc.) in Seattle, Washington. I have caused to be filed written testimony in support of USWC in Docket No. T-01051B-99-0105

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Scott A. McIntyre

SUBSCRIBED AND SWORN to before me this 17th day of August, 2000.

ANGIE LEIFER
NOTARY PUBLIC
COMMISSION EXPIRES 8-08-02
STATE OF WASHINGTON

Notary Public residing at
Seattle, Washington.

My Commission Expires: 8/8/02