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STAFF MEMORANDUM

To: THE COMMISSION

Arizona Corporation Commission

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From: Steven M. Olea  
Interim Director  
Safety Division

OCT 25 2010

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Date: October 26, 2010

DOCKETED BY

ARIZONA CORPORATION COMMISSION  
DOCKET CONTROL

RE: IN THE MATTER OF THE APPLICATION OF THE CITY OF PHOENIX TO  
UPGRADE A CROSSING OF THE UNION PACIFIC RAILROAD AT LOWER  
BUCKEYE ROAD IN THE CITY OF PHOENIX, MARICOPA COUNTY, ARIZONA,  
USDOT NO.741-028-L.

DOCKET NO. RR-03639A-10-0355

**Background**

On August 26, 2010, the City of Phoenix ("City") filed with the Arizona Corporation Commission ("Commission") an application for approval for the Union Pacific Railroad ("Railroad") to upgrade an existing crossing at Lower Buckeye Road in the City of Phoenix, Maricopa County, Arizona at USDOT No. 741-028-L.

Commission Railroad Safety Section ("Staff") records indicate, the presence of automatic warning devices at Lower Buckeye Road since June 11, 1974.

On May 18, 2009, Staff, the Railroad, TY International (consultants to the City), and the City participated in a diagnostic review of the proposed improvements at Lower Buckeye Road. All parties present were in agreement regarding the proposed improvements at the crossing. The following is a break down of the crossing in this application, including information about the crossing that was provided to Staff by the City and its consultants.

**Geographical Information**

The rail spur runs in a southeast to northwest direction and is accessed from the Railroad's main track by a track switch. This rail spur serves both commercial and industrial customers in this area. Lower Buckeye Road is an east to west main arterial through the City. The railroad crossing at Lower Buckeye Road is approximately 1,306 feet west of 35<sup>th</sup> Avenue and 3,980 feet east of 43<sup>rd</sup> Avenue. The general area surrounding the crossing is a mix of commercial, and industrial businesses (see Exhibit A).

**Lower Buckeye Road**

The existing roadway is a paved two lane road. The proposed project includes widening the roadway to five lanes, two eastbound lanes and two westbound lanes and a continuous left turn lane, including curb and gutter. The City's proposed upgrades will replace the existing incandescent flashing lights, gate mechanisms, bells and detection circuitry, with the latest in industry standards to include: 12-inch LED flashing lights, median and curb-side automatic

gates, bells, and constant warning time circuitry. A new concrete crossing surface will be added, along with replacing any impacted pavement markings. The proposed measures are consistent with safety measures employed at similar at-grade crossings in the State. The estimated cost of the proposed railroad crossing upgrade is \$417,787.20. The City is paying for the entire cost of the crossing improvements. The Railroad will maintain the warning devices and the crossing surface.

Traffic data for Lower Buckeye Road between 35<sup>th</sup> Avenue and 43<sup>rd</sup> Avenue was provided by the City. The data shows the Average Daily Traffic ("ADT") for 2005 to be 14,800, vehicles per day ("vpd"). Staff requested the current Level of Service ("LOS") for Lower Buckeye Road, and the City provided the following answer:

*Existing traffic at the intersection of Lower Buckeye Road with 43<sup>rd</sup> Avenue and 35<sup>th</sup> Avenue seems to be operating adequately.*

No future LOS was provided.

The American Association of State Highway and Transportation Officials ("AASHTO") Geometric Design of Highways and Streets, 2004, states that the Level of Service characterizes the operating conditions on a facility in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. This is a measure of roadway congestion ranging from LOS A--least congested--to LOS F--most congested. LOS is one of the most common terms used to describe how "good" or how "bad" traffic is projected to be.

The posted speed limit on Lower Buckeye Road is 45 mph. Staff records, as well as Federal Railroad Administration ("FRA") accident/incident records, indicate one accident at this crossing on October 2, 1991, in which a vehicle drove through the downed gates and struck the train. No injuries or fatalities were reported.

Alternative routes from this crossing are as follows; to the west approximately 0.75 miles is 43<sup>rd</sup> Avenue, an at-grade crossing, and to the east approximately 0.25 miles is 35<sup>th</sup> Avenue, also an at-grade crossing.

### **Train Data**

Data provided by the City regarding train movements through this crossing are as follows:

Train Count: 1 train per day (all freight trains/no passenger trains)

Train Speed: 10 mph

Thru Freight/Switching Moves: All movements through this crossing are switching movements.

### **Schools and Bus Routes**

The following schools are located within a three mile radius of the crossing:

#### Elementary Schools:

- ✓ Jack L. Kuban Elementary School – 3201 W. Sherman St.
- ✓ Alfred F. Garcia School – 1441 S. 27<sup>th</sup> Avenue

- ✓ Riverside Elementary School – 1414 S. 51<sup>st</sup> Avenue

Per the City of Phoenix:

*There are no school buses utilizing this crossing.*

### **Hospitals**

The nearest hospital or health-care facilities to the Lower Buckeye Road crossing are as follows;

#### Hospitals:

- ✓ Promise Hospital of Phoenix – 1201 S. 7<sup>th</sup> Avenue
- ✓ Banner Good Samaritan – 1111 E. McDowell Road
- ✓ St. Luke's Medical Center – 1800 E. Van Buren Street

No data was available for the number of emergency vehicles utilizing this crossing.

### **Hazardous Materials**

The City gave the following response when asked about vehicles transporting hazardous materials through this crossing:

*No data is available for the number of vehicles carrying hazardous materials at this location.*

### **Zoning**

Staff requested the City provide information regarding the type of zoning in adjacent areas from the crossing. The following was the City's response:

*The area surrounding this crossing is 100% industrial.*

### **Spur Lines**

The City gave the following answer regarding spur lines in the area that were removed by the Railroad:

*No spur removals.*

### **The Federal Highway Administration ("FHWA") Guidelines Regarding Grade Separation**

The FHWA Railroad-Highway Grade Crossing Handbook (Revised Second Edition August 2007) provides nine criteria for determining whether highway-rail crossings should be considered for grade separation or otherwise eliminated across the railroad right of way. The Crossing Handbook indicates that grade separation or crossing elimination should be considered whenever one or more of the nine conditions are met. The nine criteria are applied to this crossing application as follows:

		<b>Lower Buckeye Road</b>
The highway is a part of the designated Interstate Highway System	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No
The highway is otherwise designed to have full controlled access	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No
The posted highway speed equals or exceeds 70 mph	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No
Maximum authorized train speed exceeds 110 mph	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No
An average of 150 or more trains per day or 300 million gross tons/year	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural; or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No
Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	N/A <sup>1</sup>
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No

<sup>1</sup> N/A = Not Applicable

### **Vehicular Delays at Crossings**

The delay time is measured from the point that the warning devices are activated at the crossing to the time the train has cleared the crossing and the warning devices are reset. Based on the current single track configuration, the City gave the following response about delay time for vehicles at the crossing in this application.

*No traffic delay has been experienced.*

While no delay calculations were performed, Staff believes current delays fall well below the FHWA recommended threshold of 40 delay hours per day. Since no future traffic studies were conducted it is unclear whether the 40 hour threshold would be met. However, given the type of train operation (switching) and the surrounding industrial area, Staff believes any future delays would be minimal and not exceed 40 hours at this crossing. It is very likely that the road authority would consider some kind of roadway project to address the traffic delays before the level of delay reached that point.

Another commonly used measure outlined in the FHWA Guidelines, the so-called Crossing Exposure Index (which is simply the product of the number of trains per day multiplied by the number of vehicles crossing daily), is not currently met at this crossing. The current Crossing Exposure Index is 14,800, which is well below the threshold of 1 million for urban areas. It should be noted that the criteria identified in the FHWA material are not mandates, but guidelines established by the Federal Highway Administration, which serve to alert those having jurisdiction that potential problems may arise.

### **Grade Separation**

With regard to grade separating this crossing, the City gave the following response:

*There is minimal railroad right-of-way (50' to the north and 33' to the south) with no additional room to expand on either side. This would require the grade separated crossing to utilize retaining walls all the way which is costly.*

*The crossing is used by service trains not mainline trains and the cost of a grade separated crossing cannot be justified for this type of service. Lower Buckeye Road is bound by several industrial properties near the crossing. Proposing a grade separated crossing would eliminate all access to these properties.*

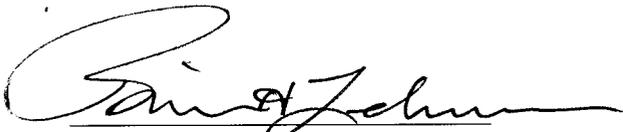
Staff has utilized the FHWA Guidelines to determine the potential need for grade separation at this crossing. Based on existing conditions, the crossing in this application meets none of the nine criteria for consideration of grade separation. No future traffic projections were performed.

### **Crossing Closure**

The area surrounding this crossing is highly developed with commercial and industrial businesses. To close this crossing would have a negative effect on many of the local businesses. Therefore, Staff would not recommend closure of this crossing.

### **Staff Conclusions**

Having reviewed all applicable data, Staff supports the City's application. Staff believes that the upgrades are in the public interest and are reasonable. Staff believes that the measures proposed by the City are consistent with other similar at-grade crossings in the State and will provide for the public's safety. Therefore, Staff recommends approval of the City's application.

A handwritten signature in black ink, appearing to read "Brian H. Lehman". The signature is fluid and cursive, with a large initial "B" and "L".

Brian H. Lehman  
Railroad Safety Supervisor  
Safety Division

Originator: BHL

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This 26th day of October, 2010 to:

Docket No. RR-03639A-10-0355

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UPCROSSING

S 37th Ave

S 39th Ave

S 35th Ave

W Lower Buckeye Rd

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Eye alt 3920 ft

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33°25'21.19"N 112°08'19.16"W elev 1039 ft

831 ft

Imagery Date: Nov 20, 2009



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Eye alt 1653 ft

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33°25'21.20" N 112°08'19.54" W elev 1039 ft

177 ft

Imagery Date: Nov 20, 2009