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STAFF MEMORANDUM

To: THE COMMISSION

From: Robert Marvin
Director
Safety Division

Date: May 15, 2014

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Arizona Corporation Commission
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RE: IN THE MATTER OF THE APPLICATION OF THE ARIZONA DEPARTMENT OF TRANSPORTATION TO UPGRADE AN EXISTING CROSSING OF THE UNION PACIFIC RAILROAD COMPANY AT BROADWAY ROAD IN THE CITY OF TEMPE, MARICOPA COUNTY, ARIZONA, USDOT NO. 741-565-L.

DOCKET NO. RR-03639A-14-0078

Background

On March 4, 2014, the Arizona Department of Transportation (“ADOT”) filed with the Arizona Corporation Commission (“Commission”) an application for approval for the Union Pacific Railroad (“Railroad”) to upgrade an existing crossing on the Tempe Industrial Lead at Broadway Road in the City of Tempe, (“City”), Maricopa County, Arizona at USDOT No. 741-565-L.

The Safety Division’s Railroad Safety Section, (“Staff”), ADOT, the City and the Railroad participated in several diagnostic review meetings of the proposed improvements to this crossing. All parties present were in agreement to the proposed improvements at the crossing. The following is a breakdown of the crossing in this application, including information about the crossing that was provided to Staff by ADOT.

Federal Highway Administration (“FHWA”) Section 130

This project is federally funded pursuant to 23 U.S.C. § 130 (“Section 130”). The purpose of Section 130 is to comply with legislation seeking to eliminate hazards to pedestrians and highway vehicles at public railway-highway crossings. Only crossings which are located on public roads, and which are not primarily for the benefit of the railroad, are eligible for Section 130 funding. In order to be eligible for Section 130 funding, a crossing must be designated on the Commission’s Annual Crossing Array as being a priority to receive safety upgrades. Arizona Revised Statute § 40-337.03 states that:

[T]he commission shall submit to the railroad involved and the city, county and department of transportation in which jurisdiction a public railroad grade crossing is located, an array of such crossings where the installation of automatic warning signals or devices should be considered during the year, or within a reasonable time thereafter depending upon the availability of monies, materials, labor and other factors involved in such installation.

This project was approved for Section 130 funding as part of the 2008 Commission Annual Array approved by Decision No.70481, dated September 3, 2008. After designation on the Annual Array, FHWA issues authorizations for design and construction of each project, reimburses ADOT for the cost and conducts a final inspection of each project. The Railroad will invoice ADOT for 100% of the cost of the project.

Broadway Road

Broadway Road is an east-west roadway, consisting of three eastbound lanes, one 2-way center left turn lane and two westbound lanes. Currently, this crossing is equipped with flashing lights, gates and a cantilever. The proposed project consists of installing two new curbside automatic gates with LED flashing light units, a cantilever with LED flashing lights for eastbound traffic and two new automatic gates with LED flashing light units within a new raised median. Constant Warning Time circuitry will also be installed. The proposed improvements will provide enhanced warning device coverage for all lanes of traffic, plus the latest technology in train detection equipment. The City will also construct sidewalks, improve the roadway approaches to the crossing and install the raised median. Pavement markings will also be replenished. The proposed measures are consistent with safety measures employed at similar at-grade crossings in the State. The Railroad will maintain the warning devices and crossing surface after the upgrades are completed.

Traffic data for Broadway Road was provided to ADOT by the City. Per the City, in 2013 there were 26,396 vehicles per day ("VPD") at this crossing. The Level of Service ("LOS") for this crossing is LOS B.

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 Broadway Road is 40 mph. Staff records, as well as the Federal Railroad Administration's ("FRA") accident/incident records indicate one accident at this crossing. The incident occurred on July 28, 1975 and was the result of the driver not stopping for the descending gates. The vehicle struck the train, however there were no injuries reported.

Alternative routes from this crossing are: to the south 1.0 mile is Southern Avenue and to the north 1 mile is University Drive. Both are at grade crossings.

Train Data

Data provided by ADOT from the Railroad regarding train movements through this crossing are as follows:

Train Count: 2 trains per day with no passenger service

Maximum Train Speed: 20 mph

Thru Freight/Switching Moves: there are no switching movements through the crossing

Schools and Bus Routes

The following are schools near this crossing:

- Tempe High School 1730 S Mill Ave.
- Gilliland Middle School 1025 S Beck Ave.
- Tempe Academy of Intl. Studies 2250 S College Ave.
- ASU 1111 S. Union Dr.
- McKemy Middle School 3205 S Rural Rd.
- Our Lady of Mt. Carmel School 2117 S. Rural Rad.

Per the Tempe Union High School District and Tempe Elementary School District, school buses utilize this crossing 39 times per day. No incidents involving school buses have been reported.

Hospitals

ADOT gave the following response about hospitals and emergency services vehicles:

Tempe St. Luke's Hospital is located at 1500 S. Mill Avenue. The City of Tempe stated that Broadway Road is a major emergency services route for the hospital.

Hazardous Materials

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

The City of Tempe stated that they are not aware of any vehicles carrying hazardous materials that utilize this crossing.

Zoning

Staff requested information from ADOT regarding the type of zoning in adjacent areas from this crossing. The following was the response given:

The areas adjacent to the Broadway Road railroad crossing are zoned as Commercial, Educational and residential.

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:

		Broadway Road
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	No
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2030	No

Grade Separation

ADOT gave the following response about grade separation:

Grade separation was not considered by ADOT as part of this Section 130 safety upgrade due to the proximity of the crossing to the Arizona State University campus and Mill Avenue, a major street in Tempe, and the overall high cost to complete a grade separation at this location.

Cost estimates for grade separating this location would be in the \$30,000,000 range, due to the urbanized location.

Vehicular Delays at Crossings

The City of Tempe stated that the delay at the crossing is really a function of the average length of the train and the average speed that it is traveling. The City of Tempe provided an example that a 7,000 foot train traveling 30 miles per hour would cause a traffic delay of approximately 3.5 minutes.

Another commonly used measure outlined in the FHWA Guidelines; is 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 is 52,792 at Broadway Road, far below the 1,000,000 threshold for urban areas. It should be noted that the criteria identified in the FHWA material are not mandates, but guidelines established by the FHWA, which serve to alert those having jurisdiction that potential problems may arise.

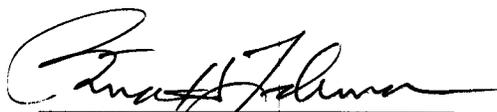
Staff has utilized the FHWA Guidelines to determine the potential need for grade separation at this crossing. Based on existing conditions, Broadway Road meets none of the nine criteria for consideration of grade separation. Staff does not recommend a grade separation at the crossing.

Crossing Closure

The City has stated they would not like to close this crossing. Doing so would negatively impact numerous businesses in the area. Staff agrees that closure of the crossing would have an adverse effect on businesses and residents in close proximity of the crossing.

Staff Conclusions

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



Brian H. Lehman
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Safety Division

Originator: BHL

Original and thirteen (13) copies
of the foregoing were filed this
15th day of May, 2014 with:

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Broadway Road Crossing

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Google earth

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feet
meters

300
90





1000
300

feet
meters

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