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Memorandum

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To: THE COMMISSION Arizona Corporation Commission

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From: Steven M. Olea
Interim Director
Safety Division

NOV 10 2011

AZ CORP COMMISSION
DOCKET CONTROL

Date: November 10, 2011

DOCKETED BY 

RE: SUPPLEMENTAL STAFF REPORT FOR:

IN THE MATTER OF THE APPLICATION OF THE ARIZONA DEPARTMENT OF TRANSPORTATION TO REMOVE AN EXISTING AT-GRADE CROSSING OF THE BURLINGTON NORTHERN SANTA FE RAILWAY AT STATE ROUTE 303 NORTH OF OLIVE AVENUE AND TO REPLACE IT WITH A NEW GRADE SEPERATED CROSSING, IN MARICOPA COUNTY, ARIZONA, USDOT NO. 025-650-C

DOCKET NO. RR-02635B-11-0282

Since the filing of the original Staff Report in the above captioned matter, it has come to the attention of Railroad Safety Section Staff ("Staff") that an issue that was not discussed within the Staff Report has arisen. In this application, a proposed temporary at-grade crossing will be installed to allow for a traffic detour during construction of the new grade separation. The temporary crossing will include railroad preemption of traffic signals.

Recently, Staff has become aware of an issue related to the implementation of traffic signal preemption at railroad crossings. Staff believes that some highway/rail at-grade crossings with railroad preemption may not have adequate timing sequences within the traffic signal controller. As a result of this improper timing, large vehicles that have stopped at a traffic intersection for a red light may protrude into the crossing intersection and be vulnerable to collision with oncoming trains. Likewise, a smaller vehicle, queued bumper to bumper among other vehicles, could be trapped in a crossing. In these circumstances, it is appropriate to utilize what is known as a track clearance green sequence. Track clearance green is a timing sequence that allows vehicles within the queue area to clear the track. The timing sequence must be sufficient to allow the design vehicle stopped within the minimum track clearance distance to start up and move through the queue area safely. Gate down logic circuitry prevents the track clearance green sequence from terminating until the descending crossing gate is 5 degrees from a horizontal position. During the track clearance green sequence, traffic signals at the intersection allowing movement over the tracks are at stop. Proper timing is essential for the sequence to work.

Both gate down logic circuitry and proper timing of the track clearance green sequence are necessary to ensure the safe operation of crossings that employ traffic signal preemption, as has been found by the Federal Railroad Administration ("FRA"). In 2010, the FRA, in conjunction with the Federal Highway Administration ("FHWA"), issued safety advisory FRA 2010-02, which highlights the issue of appropriate timing of traffic signal preemption interconnections. Thus, gate down logic circuitry is crucial to the effective employment of track clearance green.

Staff recommends that the Arizona Department of Transportation ("ADOT") or its contractor complete the Texas Department of Transportation's ("TxDOT") worksheet, entitled "Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings," or a similar worksheet derived from TxDOT's worksheet. The main purpose of this worksheet is to determine if additional time (advance preemption) is required for the traffic signal to move stationary vehicles out of the crossing before the arrival of the train. This document can be found in the FHWA's "Railroad-Highway Grade Crossing Handbook", Revised Second Edition, August 2007, pages 294-296. Upon completion of the worksheet, Staff recommends that ADOT file the worksheet as a compliance item in this Docket so that Staff can evaluate whether the additional time determined by the calculation is appropriate. Staff shall file its evaluation of the timing calculation as a compliance item in this Docket. The Commission's approval of an order in this matter should be expressly conditioned upon ADOT's compliance with these filings indicating appropriate timing for the circuitry. Staff further recommends that, upon Staff approval of the timing recommendation, further alterations of the timing require a new application or an amendment to the order in order to implement any changes to the timing.



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Railroad Safety Supervisor
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Originator: BHL

COPIES of the foregoing mailed
This 10th day of November, 2011 to:

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