



CITY OF
TUCSON

DEPARTMENT OF
TRANSPORTATION

July 8, 2011

Michael R. Blankenship, P.E.
Road Safety Assessment
Arizona Department of Transportation
1615 West Jackson Street, MD 065R
Phoenix, AZ 85007-3217

**SUBJECT: Congress Street/4th Avenue/Toole Avenue Tucson, Arizona
Road Safety Assessment**

Dear Mr. Blankenship:

Thank you for your time and attention given to the Road Safety Assessment conducted April 26-28, 2011, at the Congress Street/4th Avenue/Toole Avenue intersection and surrounding area. We appreciate the documentation of your recommendations. They will assist us in implementing improvements at this intersection.

Please find below the City of Tucson's formal response to the recommendations contained in your final report dated May, 2011. We have structured this response according to the table beginning on page 19, which summarizes the RSA team's observations and potential opportunities to improve safety.

General Observations

Recommendation:

The City should consider requiring a Traffic Impact Analysis for planned development in the study area that evaluates all modes of travel.

Response:

City of Tucson Transportation Access Management Guidelines require a Traffic Impact Analysis (TIA) for any development that generates more than 100 trips during the peak hour. The proposed developments for this area fall in this category. Barring no unusual circumstances, a TIA should be prepared for each of these developments.

Intersection Operations

Short Term Recommendations:

Short term recommendations include: 1) Install double solid white line between center and right lanes through the intersection; 2) Install word message pavement markings; 3) Clean or refresh existing pavement markings; 4) Delineate the raised island and bulb out; 5) Install bike box on 4th Avenue approach; 6) Prohibit right turns on red for southbound 4th Ave; 7) Install Shared Lane Markings and way finding dots to help bicycles navigate the intersection; 8) Consider prohibiting right turn on red from North Toole Avenue; 9) Consider converting the right lane into a right-turn-only lane for northbound 4th Avenue.

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Response:

Many of these recommendations will be implemented in conjunction with construction of the Modern Streetcar platform for the Plaza Centro Development, specifically Numbers 2, 4, 5, 6, 8, and 9. Please see Exhibit 1, labeled "Congress/4th/Toole Immediate Term Striping Improvements," which illustrates these changes. We will ask that all the thermoplastic pavement markings be refreshed with implementation of these changes (No. 3).

The striping changes shown in Exhibit 1 need not be obliterated in the event the south curb line changes. We are reluctant to install pavement markings that will have to be obliterated in the event the south curb line changes. Nos. 1 and 7 would be "throw-away" improvements, and would have to be obliterated in order to accommodate bike lanes to the left of the (future) right-turn lane for northbound 4th Avenue. The Immediate Term Striping Improvements are scheduled to be completed by September 2011.

Mid-Term Recommendations:

Mid-term recommendations include: 1) Widen Congress Street to allow for a bike lane on the south side of the tracks; and 2) Incorporate a bike facility into the Plaza Centro project to allow access to the 4th Avenue underpass in conjunction with the garage.

Response:

Widening Congress Street for bike lanes is being pursued as part of the development of the old Greyhound parcel, on the south side of the street, opposite Plaza Centro. While such undertakings are subject to the vagaries of the economy, indications are that construction of the student housing project will begin in January 2012.

The developer for the Plaza Centro site has made a commitment to providing the bike facility on the north side of the building, as recommended in No. 2, above, that would connect to the bike/pedestrian bridge over 4th Avenue.

Long Term Recommendations:

Long term recommendations include closing Toole Avenue to vehicular traffic, so as to provide an "Event Plaza" on Toole Avenue, between the Hotel Congress and Maynard's Market, possibly in conjunction with converting the on-street parking on Congress Street between 4th and 5th Avenues into a right-turn lane and providing an uncontrolled left-turn from 5th Avenue to Toole Avenue, with STOP control for Toole Avenue. Alternatively, according to the report, Toole Avenue might be converted to one-way (northwest-bound) operations.

Response:

Closing Toole Avenue cannot be achieved unilaterally, but rather must be achieved in coordination with the stakeholders in the area. While the creation of an Event Plaza may be perceived by business interests as an attractive proposal, elimination of on-street parking on Congress Street is typically not well-received by businesses.

Recent counts point to almost 700 vehicles exiting from northwest-bound Congress Street to northwest-bound Toole Avenue during the p.m. peak hour. It is not immediately clear that replacing the parking lane on Congress Street with a right-turn lane will mitigate the loss of Toole Avenue access. Computer simulations are being developed to determine whether the intersections will operate adequately with Toole Avenue either closed or as a one-way facility. City staff have begun building a computer model of the area, which will be used to test different alternatives, including converting the existing shared

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through-right-turn lane on Congress Street into an exclusive right-turn lane for northbound 4th Avenue.

Bicyclist and Pedestrian Issues

Recommendations include:

- 1) Provide "Bike Boxes" for southbound 4th Avenue at Congress Street and for westbound Congress Street at 4th Avenue;
- 2) Install the R9-5 (Bicycle Symbol USE PED SIGNAL) sign for bicycles crossing Congress Street to the Herbert Avenue alignment;
- 3) Provide a bicycle path (with appropriate way finding signs) between N. Toole Avenue and S. Toole Avenue via the pedestrian bridge, including providing a ramp at Toole Avenue;
- 4) Install crosswalks across 4th Avenue;
- 5) Provide a bicycle lane on Congress Street, to the south of the streetcar tracks, as discussed previously, or use Shared Lane Markings;
- 6) Use green bike lanes;
- 7) Provide a two-way shared bike/pedestrian facility to/from S. 4th Avenue, either on the sidewalk or along the Herbert Avenue alignment;
- 8) Provide a cycle-track between the transit platform and the sidewalk;
- 9) Identify and mark safer locations for bicyclists to cross the streetcar tracks;
- 10) Install a raised pedestrian crosswalk across Congress Street at the S. Toole Avenue intersection and at the N. Toole Avenue intersection;
- 11) Adjust traffic signal operations to allow the pedestrian indication to come up without activating the pedestrian push button;
- 12) Add a bicycle/pedestrian scramble phase;
- 13) Evaluate pedestrian crossing activity and connectivity following completion of student housing developments and consider an overhead walkway;
- 14) Consider pedestrian circulation in the design of these developments.

Response:

It is clear that bicycle circulation needs to be addressed at this location with way finding signs/markings and regulatory signs that legalize riding bicycles on sidewalks, where appropriate. A system of way finding signs and markings will be established by the Department of Transportation in conjunction with the development interests of the adjacent properties. For example, the developer has committed to providing a bicycle path behind the Plaza Centro development, providing access to the bicycle/pedestrian bridge (No. 3). Also developers appear to be in agreement about providing a shared-use facility along the Herbert Avenue alignment (No. 7). Use of the R9-5 sign (No. 2) will be evaluated in terms of the bigger picture for bike circulation, with an eye toward minimizing conflicts with pedestrians.

Some of the other recommendations are being implemented immediately. Among these is installation of a bike box for southbound 4th Avenue (No. 1), which is being implemented as part of the Immediate Term Improvements (See Exhibit 1). Also being implemented immediately is provision of a cycle track between the streetcar platform and the sidewalk, which is being included in the design/construction of the Modern Streetcar platform (No. 8).

Bike lanes to the left of the tracks (No. 5) require pushing back the south curb. As noted, this may be accomplished by the property developer in the short term. When bike lanes are installed, permanent pavement markings can be established, including a bike box for

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westbound Congress Street (No. 1) and shared lane markings for bicyclists continuing on Congress Street (No. 5). Green material (No. 6) will be applied in conjunction with the bike boxes, and at other locations upon review and approval by the City of Tucson.

Currently there is no need for a crosswalk across Congress Street at S. Toole Avenue (No. 10). However, as the vacant lots develop, and pedestrian volumes increase, a crosswalk at S. Toole Avenue will have increased utility. A raised crosswalk has the additional advantage of slowing traffic. Emergency Services has indicated acceptance of a speed table at this location, according to the process that has been set up by the Transportation Department for traffic calming features. This may be included among the Immediate Term Improvements, pending funding availability. The other recommendations for pedestrian facilities will have to be examined closely before implementation, including the addition of a non ADA-compliant crosswalk (No. 4).

Other recommendations continue to be evaluated. Traffic signal changes that may impact intersection performance (Nos. 11 and 12) will be investigated in conjunction with the traffic simulation, already discussed. Nos. 13 and 14 will occur as a consequence of the anticipated developments in the area.

Streetcar Issues

The following recommendations are enumerated under the heading of "Streetcar Issues":

- 1) Provide flange lubricant at sharp curves;
- 2) Revise signal phasing at S. Toole Avenue for three-phase operation or provide a gate;
- 3) Conduct education/enforcement campaign prior to streetcar operations;
- 4) Evaluate sight distances for streetcar operators;
- 5) Use flange filler where bicycles cross tracks;
- 6) Address traffic signals in contact with the streetcar overhead system;
- 7) Relocate signs that may be blocked from drivers' view by a streetcar at the Plaza Centro stop;
- 8) Coordinate intersection maintenance with streetcar operations;
- 9) Install DO NOT BLOCK INTERSECTION signs and markings to discourage queuing in the signalized intersections;
- 10) Provide priority signal operations for the streetcar;
- 11) Install a double white lane line between the center lane the right lane on Congress Street.

Response:

Numbers 1, 2, 3, 6, 7, and 8 will be considered as the streetcar comes into operation. The Modern Streetcar Safety and Security Plan requires includes development of operational manuals, which will specifically address Numbers 3 and 8. The Safety and Security Committee has already considered Item No. 6 in its Preliminary Hazards Analysis. Since the streetcar operates in motor vehicle travel lanes, sight distances (No. 4) for streetcar operators will be equal to or better than those of motor vehicle drivers. The Modern Streetcar design team has been and will continue to actively investigate flange filler material (No. 5). No. 9 would be unnecessary if No. 2 is implemented, and No. 2 is more easily implemented as it does not involve special signal heads for streetcars. A double white line (or gore area) will be implemented following widening of Congress Street for bike lanes (No. 10).

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Signing

Recommendations:

The Roadway Safety Assessment has the following recommendations relative to signing:

- 1) Install overhead lane-use signs;
- 2) Install pavement marking messages for lane use;
- 3) Evaluate the need for enhanced warning signs for bicyclists.

Response:

Unfortunately, overhead signing is impractical within the streetcar alignment due to the large number of suspending wires, and overhead signing is unfeasible for the Broadway Boulevard approach, in the absence of an overhead sign structure. A pavement word message for 4th Avenue is being called for among the Immediate Term improvements to be installed by the streetcar platform contractor (see Exhibit 1). Warning signs for bicyclists were evaluated by the Modern Streetcar designers. Issues surrounding warning signs for bicyclists are: compliance with the MUTCD (no unapproved symbols), conveying a message succinctly, and clarifying the message to be conveyed. Signing developed for the streetcar may be incorporated within the Congress Street/4th Avenue/Toole Avenue intersection, with consideration given to minimizing visual clutter.

Vehicle Speeds on Congress Street

Recommendations:

Within this category, the following recommendations were provided: 1) Install a gateway treatment; 2) Remove westbound bus lane, possibly creating a cycle track or other treatment to encourage slower speeds; 3) Install a raised pedestrian crosswalk at S. Toole Avenue; 4) Consider fixed photo enforcement operations.

Response:

Although the City has no immediate plans to install a gateway treatment, one may be considered by the developer of adjacent lots. A draft plan is being developed for a parking lane/cycle track treatment on the Broadway Boulevard approach to the Congress Street/4th Avenue/Toole Avenue intersection (See Exhibit 2). The concept of a raised pedestrian crosswalk at S. Toole Avenue has been approved by emergency services and may be funded among the immediate-term improvements. See the Enforcement category for the response from the Tucson Police Department regarding enforcement activities.

Broadway Boulevard

Recommendations:

The RSA final report listed the following recommendations for Broadway Boulevard: 1) Narrow vehicle lanes and widen green bike lane; and 2) Provide bike actuation for the HAWK pedestrian beacon at the Broadway Boulevard/4th Avenue intersection.

Response:

Given that the eastbound lanes of Broadway Boulevard are outside the study area, and there are pressing (and stated) needs for the Congress Street/4th Avenue/Toole Avenue intersection, there will be no narrowing of vehicle travel lanes nor will there be any widening the green bike lane on Broadway Boulevard. Since it plays a role in bicycle and pedestrian circulation through the study intersection, the HAWK pedestrian beacon is relevant to this Roadway Safety Assessment. The HAWK beacon is by definition a pedestrian crossing device (not a bicycle crossing device). Nonetheless, the city is investigating ways to make the HAWK more bicycle friendly. As these ways are

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identified, they will be incorporated at HAWKs with high bicycle utilization, possibly including the HAWK at the Broadway Boulevard/4th Avenue intersection, pending funding availability.

Queuing and Clearing

Recommendation:

Evaluate and adjust the network signal timing and coordination, with consideration for streetcar needs.

Response:

The traffic simulation model for downtown Tucson has been updated to incorporate the two new signals at N. 4th Avenue and at S. Toole Avenue. This tool will be used to evaluate lane assignment and signal timing changes.

New Parking Structure

Recommendations:

1) Evaluate the parking garage ingress/egress; 2) Consider providing "Full Lot" signing visible from Congress Street.

Response:

A post-RSA evaluation was conducted by the developers of the Plaza Centro parking structure. There will be no change to the ingress/egress of the parking garage. Due to the limited number of parking spaces and the anticipated customer base (non-commuter), they are convinced that access to the garage will not impact traffic operations. Full Lot signing will be utilized.

Maintenance and ADA Issues

Recommendations:

Address tree-related maintenance and ADA issues.

Response:

If a minimum 4-ft clear path is provided, there is no ADA issue, however, trip hazards may exist. Work requests will be issued for street maintenance to reset tree grates where they are not flush.

Enforcement

Recommendations:

1) Issue citations for motor vehicle violations; 2) Prepare a city ordinance giving priority to the streetcar; 3) Provide photo enforcement; 4) Issue warnings/citations for pedestrian and bicycle violations.

Response:

The Tucson Police Department (TPD) started enforcement efforts targeting this area the week of June 12, 2011. All three of the user groups are being given equal attention. The enforcement is a combination of on-duty and grant-funded resources. TPD also deployed a radar speed notification trailer as you approach the area westbound on Broadway Boulevard at Aviation. Enforcement will be ongoing and part of the routine rotation of on-duty traffic enforcement resources.

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TPD staff is currently working on a new city ordinance that will provide enforceable regulations related to the safe operation of the streetcar such as overhead clearance, side clearance, passing and other right-of-way issues that will provide priority to the street car. It is anticipated this ordinance will go to Mayor and Council within 6 months for approval. Finally, TPD staff has requested that photo enforcement deployments of the Broadway Boulevard/Congress Street/Toole Avenue area be included in the current scheduling of the enforcement van.

This concludes the city's formal response to the Congress Street/4th Avenue/Toole Avenue Roadway Safety Assessment. Once again, we thank you and your review team for your diligent efforts and recommendations toward improving this major downtown intersection.

If you have any questions, please contact Andrew McGovern at 791-4371.

Sincerely,



James W. Glock, P. E.
Transportation Director

JWG:AMcG/deb

c: Andrew McGovern, Transportation Administrator
Diahn Swartz, Traffic, Planning and Design
Tom Thivener, Traffic, Planning and Design

Enclosures: Exhibit 1, "Immediate Term Improvements"
Exhibit 2, "Broadway Cycle Track" (2 pages)

EXHIBIT 1
CONGRESS ST/4TH
AVE /TODDLE AVE
IMMEDIATE TERM
IMPROVEMENTS

VERSION 05-10-11





EXHIBIT 2
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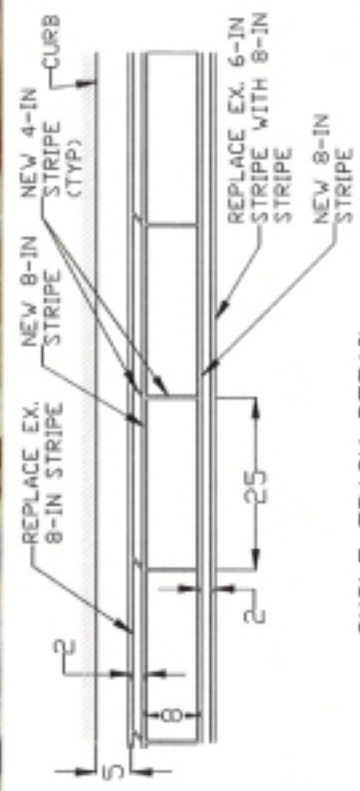
1"=50'

22 SPACES THIS SIDE OF INTERSECTION

BY OTHERS
REPLACE SOLID STRIPE WITH MINI-SKIP (W08-2X6) PATTERN

WS12 (TYP)

BROADWAY BL CYCLE TRACK
44 NEW PARKING STALLS TOTAL
DRAFT 06-27-11
PAGE 1 OF 2



CYCLE TRACK DETAIL



BROADWAY BL CYCLE TRACK
 DRAFT 06-27-11
 PAGE 2 OF 2