

MAG NON-RECURRING CONGESTION STUDY

**MAG Contract No. 418 Project No. PL10-1
Technical Memorandum No. 6 – Development of the Framework for a Pilot Project**

INTRODUCTION

The Lee Engineering/TTI team is conducting a study on non-recurring congestion (NRC) for the Maricopa Association of Governments (MAG). This technical memorandum is the sixth in a series to document the effort on the study. This technical memorandum summarizes the work completed for Task 6 of the study which presents the framework for a pilot project to counteract NRC along the I-10 corridor in the West Valley. The corridor defined for this pilot project is I-10 from I-17 to SR 85 as shown in Figure 6-1. The pilot project is intended to work cooperatively with and build upon the work already done by the Traffic Incident Management (TIM) Coalition. The framework for the pilot project will include the definition of the various TIM Focus Areas that include processes, activities and protocols, currently utilized by all agencies involved in any TIM activity in the I-10 corridor.



Figure 6-1: Pilot Project I-10 Corridor Map

PROPOSED PARTICIPANTS IN THE I-10 CORRIDOR TIM PILOT PROJECT

DPS

ADOT

- Construction
- Maintenance
- Valley Project Management
- ALERT

MAG

Maricopa County

- Traffic Management Division
- REACT
- Medical Examiner's Office

City of Phoenix

- Street Transportation Dept.
- Police & Fire Departments
- Public Transit Department
- Information Technology Services

City of Avondale

- Traffic Engineering Division
- Police & Fire Departments
- Information Technology Dept.

City of Goodyear

- Streets and Traffic Operations
- Police Traffic Unit
- Fire Department
- Information & Technology Services Dept.

Town of Buckeye

- Public Works Department - Streets
- Police & Fire Departments
- Information Technology Dept.

Valley Metro RPTA

FHWA

- Arizona Professional Towing & Recovery Association, Inc.

SCOPE FOR THE I-10 CORRIDOR TIM PILOT PROJECT

The pilot project is envisioned as a phased approach to incident management (a study-determined primary cause of NRC in the MAG region) along the study corridor. Figure 6-2 shows the recommended process for the project.

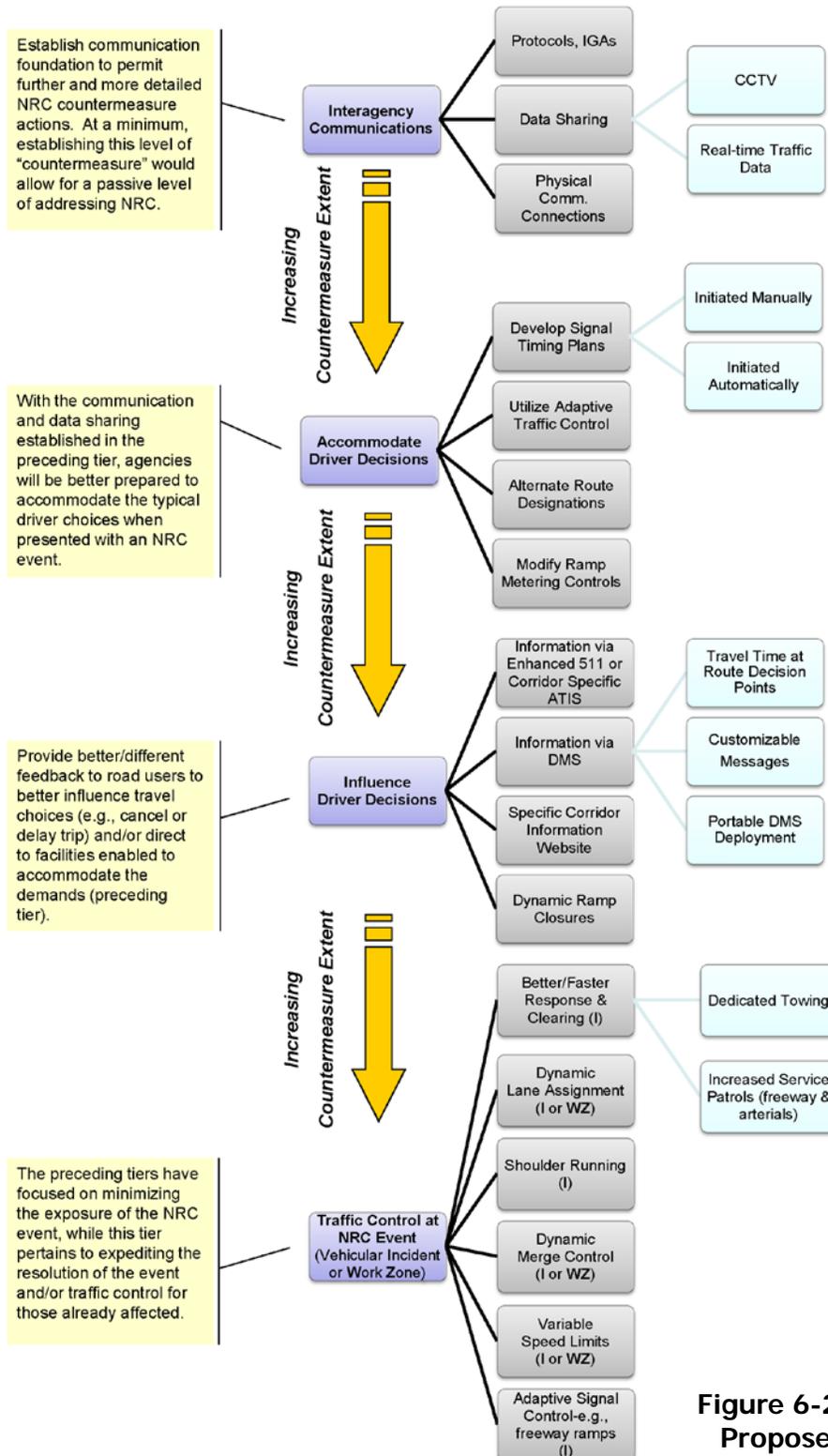


Figure 6-2: Flow Chart of Proposed Pilot Project



The following identifies the proposed phases and what could be included in each:

1. **Interagency Communications: Enhance agency communication and coordination process** – This is a short term, immediately implementable phase building on the processes already being discussed by the TIM coalition. The logical focal point will be the ADOT Traffic Operations Center (TOC), however it must be determined if the additional coordination required with other agencies for this pilot project can be accommodated with existing staff resources. The TIM coalition has the framework for coordination with other agencies including the DPS, City of Phoenix, City of Avondale and Maricopa County. This phase will define who, how and when a corridor agency will be notified when a major incident blocks two or more lanes on I-10 and what the proper course of action by the various agencies is. It will make use of existing DMS signs with agreement of what messages are displayed under what lane closure scenarios. A unified process will be established for communicating with and providing updates to broadcast print and internet media.
2. **Accommodate Driver Decisions: Provide arterial street signal timing for incidents** – This will be a near term (within 2 years) phase in which traffic signal timing plans will be developed for the arterial streets near and parallel to I-10. This signal timing effort could be funded using the existing MAG Traffic Signal Optimization Program (TSOP). These signal plans would have longer cycle lengths favoring the directions of diverted I-10 traffic. Adaptive Traffic Signal Control (ATSC) could also be implemented. ATSC, particularly at I-10 traffic interchanges, can adapt to volatile traffic volumes expected with freeway lane closures. Additionally, ATSC may be a solution for signals with communication limitations.

The primary arterial streets initially will likely be McDowell and Van Buren. One idea is that McDowell will accept additional traffic in the event of westbound I-10 lane closure and Van Buren will accept additional traffic in the event of eastbound I-10 lane closure. The thinking behind that is that right turns will be made when departing the I-10 ramp which will accommodate more vehicles than if left turns are made. However, in either case, that also requires left turns when the rerouted vehicles reach McDowell or Van Buren.

The special timing plans will provide extra time at the intersections receiving the rerouted traffic and progression in the direction of the I-10 movement being accommodated. Although this concept is the initial thinking, simulation modeling of this scenario as well as additional scenarios (such as both right and left turns from I-10 ramps and two-way progression on McDowell and Van Buren) will be made. The first such signal timing efforts will be in locations where communication between a city TOC and the signals along McDowell and/or Van Buren either exists now or will in the near future. Currently, the City of Phoenix has about 75 percent of their signals along McDowell and Van Buren between 35th Avenue and 83rd Avenue communicating with their TMC via leased telephone lines. In early 2013 a federally-funded project will be completed that will provide fiber or wireless communication to all signals in west Phoenix along McDowell Road, Thomas Road, and Indian School Road.

Maricopa County has communications on MC 85 between 75th Avenue and Cotton Lane. The City of Avondale does not have communication to many of their signals at this time although they do have an ATMS and have some conduit and fiber. Avondale has also attempted wireless communication but is generally not satisfied with the results. Buckeye does not have an ATMS but is proceeding with conduit and fiber installation as development



occurs. Currently, the ramp signals on I-10 in this area are operated by ADOT; however there is no communication between them and the ADOT TOC. They are planned to be controlled in the future from the TOC.

A local agency in the corridor has expressed a common concern regarding their ability to take on additional signal timing tasks that may be associated with this pilot project. This concern needs to be addressed in finalizing the scope of the pilot project.

- 3. Influence Driver Decisions: Provide infrastructure improvements** – This phase will be a medium term program (3-5 years) that will require budgeting for the improvements. Needs for infrastructure improvements will be identified, such as additional fiber-optic communications in the corridor, linking all agencies via the Regional Community Network (RCN) or additional DMS. Another potential infrastructure improvement is CCTV at the intersections along McDowell Road and Van Buren Street. These improvements could be programmed in August 2011 for the FY 2015 TIP as a potential regional project involving ADOT, DPS, MCDOT, Phoenix, Buckeye, Goodyear and Avondale. This potentially will include communication from TOCs (both cities and ADOT) to other signals along the corridor needed to complete deployment of timing plans to accommodate extra diverted I-10 traffic when incidents occur.

A project in the MAG TIP for FY 2015 will fund the extension of the FMS along I-10 from 83rd Avenue to Dysart Road by 2016. The recent I-10 widening project from Dysart Road to Sarival Avenue included installation of three 3-inch conduits with pull boxes on the north and south sides of I-10 which will be utilized, at least in part, for FMS. Although there are current and future plans for additional I-10 widening between Sarival Avenue and Verrado Way, the new lanes will be located within the present median (as was the case for the completed segment from Loop 101 to Dysart Road) thereby minimizing the likelihood of FMS infrastructure being included in the work. Widening of I-10 from Verrado Way to SR 85 is expected within a later phase of the Regional Transportation Plan. The basic infrastructure (conduit, pull boxes) for FMS is only a foundational need for the purpose of the pilot project. Other FMS/ITS elements that would need to be implemented or considered include the actual fiber communication lines, dynamic message signs (DMS), CCTV cameras, vehicle sensor stations, ramp metering, road weather information system (RWIS) sites, and dust warning systems.

- 4. Traffic Control at NRC Event: Potential new methods and technology** – This phase, if done, would result from information gained in phases 1 and 2. It is included here as a potential longer term project that would likely be funded with federal funds, e.g. a TIGER grant. This would be an innovative approach to congestion management such as active traffic management. Strategies of active traffic management include variable speed limits, temporary shoulder use, junction control, and dynamic signing and rerouting.

PROPOSED EVALUATION PLAN FOR I-10 CORRIDOR TIM PILOT PROJECT

A final step for the Pilot Project is to develop an evaluation plan. The evaluation plan identifies the performance measures that should be analyzed to determine the success of the pilot project. The plan will also identify the types of data needed to assess the performance of the countermeasures. Note that one of the challenges will be comparing “before” and “after” measures for similar types of



incidents. For example, sufficient data will need to be collected for a major vehicular incident “before” the pilot project is implemented so it can be compared to “after” traffic conditions with the same type of incident. Table 1 provides a list of potential performance measures to be used for the Pilot Project. This list needs to be vetted by the SAG and/or TIM coalition to select the final performance measures.

Table 1. Potential Performance Measures for I-10 Corridor TIM Pilot Project

Types of Performance Measures	Performance Measure	MOE Priority	Comments on PM
Advanced Traveler Information During Major Traffic Incidents	Change in 511 mobile utilization	High	ADOT tracks now and can provide 511 information
	Change in 511 utilization during major traffic incidents	High	
	Use of DMS for Detour Information (Freeway) Use of DMS for Detour Information (Arterials)	High	Based on percentage of available DMS actively used during incidents (Freeways & Arterials)
	Change in Web-page utilization	High	
	Coordination with Radio/TV media	High	Based on frequency of reports/updates
Traffic Management During Major Traffic Incidents	Peak corridor travel time increase (freeway)	High	General Purpose
	Average total duration of closure	High	
	Average percentage of peak-period hours subject to any lane closure	High	Peak-periods: 6am-9am & 3pm-7pm
	Transit schedule	High	Change in number and magnitude of schedule delays
	Arterial street travel time increase	High	Need non-incident baseline travel time data
	The average number of planned traffic signal detour plans utilized per incident occurrence	High	
	Volume and throughput of HOV lanes	High	
Safety Outcomes Due to Major Traffic Incidents	Average number of secondary crashes that can be attributed to each incident	High	Need to define secondary; Share with Safe Commute
	Average severity of a secondary crash (using KABCO scale)	High	Share with Safe Commute
	Average EMS response time (detection to on-scene)	High	Share with Safe Commute
Information Sharing and Reporting	Average time to notify all key TIM members	High	Share with Safe Commute