

MID REGION COUNCIL OF GOVERNMENTS

INCIDENT MANAGEMENT PLAN FOR THE ALBUQUERQUE METROPOLITAN PLANNING AREA FINAL

June 13, 2022



FOREWORD

The intent of the Traffic Incident Management (TIM) Plan for the Albuquerque Metropolitan Planning Area (AMPA) is to provide local stakeholders with recommendations on how to improve existing traffic incident management activities. While the current version of this document provides a snapshot of the state of practice between 2020 and 2021, the document is intended to be a living reference that requires regular updating as internal agency capabilities and policies change or external conditions require different approaches. In particular, the TIM response templates, alternate route plans, and the implementation timeframes will change as agencies adopt and adapt to new TIM practices.

To maintain momentum in the advancement of TIM capabilities, it is important to hold recurring meetings with stakeholders. This can be in the form of committee meetings, informal coordination, or annual assessments. On February 9, 2022, a tabletop exercise was held with AMPA TIM stakeholders at the Regional Traffic Management Center (RTMC) in Albuquerque to allow regional stakeholders to practice incident response and management in a simulated environment. This meeting highlighted collective strengths and weaknesses and resulted in a number of potential near-term actions that could facilitate progress. Each are described below.

1. NMDOT will make a presentation at the annual dispatchers meeting (February 17th) to introduce them to the TIM Plan and increase their understanding regarding the role the RTMC can play and the resources that it can put in place to support emergency responders.
2. NMSP will add a police radio console in the new RTMC to facilitate communication.
3. MRCOG will communicate to all agency leadership that staff involved in transportation operations are advised to establish a NMRoads account to improve common situational awareness of transportation conditions.
4. Stakeholders will explore the concept of developing pre-approved traffic signal timing plans for the major diversion corridors.
5. City of Albuquerque, City of Rio Rancho, and NMDOT will determine the cost and scope of installing Centracs peer-to-peer connection.
6. NMDOT will provide NMSP a list of the top 4 information items that RTMC staff would like regarding incidents.
7. NMDOT will establish a threshold or criteria for initiating after-action debriefs so they occur on a more regular basis.
8. NMDOT will look into the process of tracking TIM training records as it does not appear that they are being actively tracked or reported to FHWA.
9. The stakeholders identified the need for regular coordination meetings between traffic agencies and law enforcement agencies. The structure, timing, and location will need to be determined based on participation.
10. The stakeholders noted an absence of common TIM performance measures across the agencies. A review of available data and desired measures should be a focus topic at an upcoming coordination meeting. Contracting external services may be needed to accomplish this action item if all agencies are short staffed.



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1 INTRODUCTION

1.1 WHAT IS TRAFFIC INCIDENT MANAGEMENT?

Traffic incident management (TIM) is the coordinated response to non-recurring events that have an impact on traffic flows. While the types and location of events can vary, the traffic incident planning, response, and management involves a wide-range of functions including: law enforcement, fire, emergency medical services, towing and recovery, transportation/traffic, communications, public media, and hazardous material. This coordination between numerous participants is the core of an effective TIM program and the impetus of this study.

1.1.1 TIM DEFINITION

FHWA defines traffic incident management as “...a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders.” The primary purpose of TIM is to reduce the duration and impact of incidents as well as to improve the safety of motorists, crash victims, and incident responders. Another goal of TIM is to provide information about the incidents to motorists, primarily to avoid secondary incidents.

1.1.2 TIM IMPORTANCE

According to the Federal Highway Administration (FHWA), traffic incidents account for approximately one-third of the congestion on highways in the United States. The number rises to 60 percent of all congestion when incidents are combined with other non-recurring events, such as weather, construction, and planned events. Aside from the regional economic and environmental impact of congestion, impacts are experienced individually as travelers are forced to endure additional time for commutes, become late to work, or miss critical appointments. The congested conditions also create hazards for both motorists and responders that can increase as the delay persists.

1.1.3 TIM TIMELINE

The timeline for an incident and the subsequent response includes many steps. The initial response includes the detection, verification, and dispatch of resources. Once on-scene, responders work to provide assistance and ensure safety, ultimately opening the roadway back to traffic. Traffic flow returns to normal once the delays and queuing associated with any restricted capacity dissipates. Nationally, the Federal Highway Administration has developed guidance to standardize the TIM timeline for consistency and reporting of performance measures. **Figure 1**, an excerpt from NCHRP 07-20, Guidance for Implementation of Traffic Incident Management Performance Measurement, shows the various steps in the timeline and the difference between response, roadway clearance, incident clearance, and time to return to normal flow. Within each of these steps, there are specific stakeholders responsible for activities that contribute to the overall TIM performance.

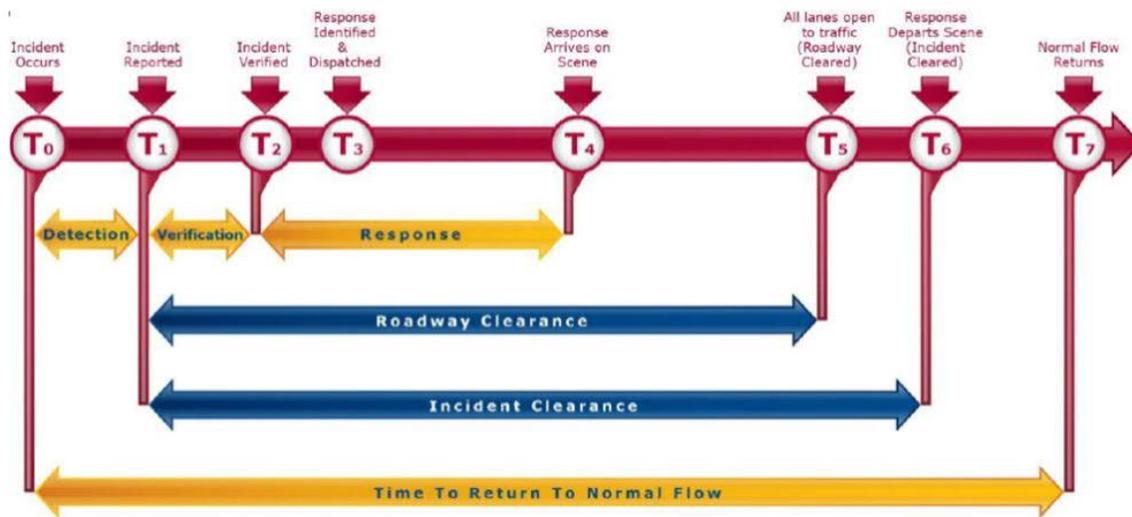


Figure 1: Traffic Incident Timeline

1.2 DOCUMENT SCOPE

The purpose of this plan is to document the existing TIM capabilities within the AMPA region and establish future priorities to improve TIM efforts in the region. The document is divided into the following chapters:

1. Introduction

This chapter provides the background information on traffic incident management, the project scope, document purpose, and document contents.

2. AMPA Existing Assessment

This chapter highlights historic crash trends, road closures, traffic performance, and an inventory of intelligent transportation systems (ITS) devices.

3. National Effective TIM Practices

This chapter provides a brief summary of national effective TIM practices organized by the following sections: on-scene emergency response and safety, traffic management tools and technology, TIM planning and training, TIM awareness, education, and outreach, and legislation.

4. AMPA Current TIM Practices

This chapter provides a summary of the existing TIM efforts within the AMPA region based on stakeholder interviews. The summary follows the same organizational structure as the national TIM practices provided in the previous chapter and a relative comparison chart is included.

5. TIM Stakeholder Workshop

This chapter summarizes the results of a stakeholder workshop during which participants prioritized those TIM practices which were either not in use or partially used. The prioritization is stratified into “high priority” and “medium priority”.

6. TIM Recommendations

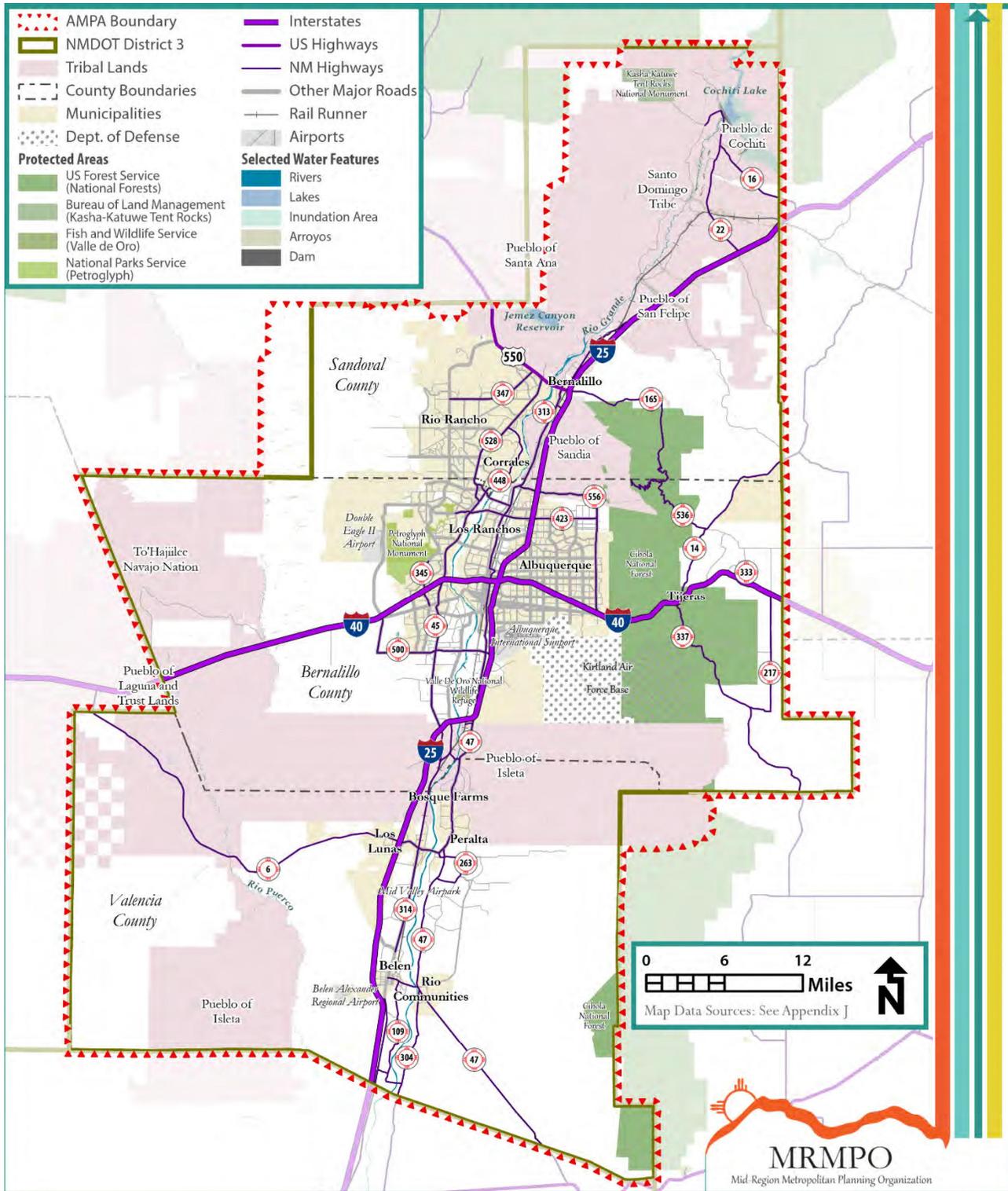
This chapter provides recommendations for the TIM practices prioritized during the stakeholder workshop. For each practice, information is provided to expand its use in the AMPA region including major implementation steps.

7. TIM Implementation

This chapter provides a recommended implementation timeline as well as supporting materials such as diversion routes and TIM response templates for stakeholder use.

1.3 STUDY GEOGRAPHIC BOUNDARIES

The Albuquerque Metropolitan Planning Area (AMPA) is geographically situated in central New Mexico. As shown in **Figure 2**, the AMPA encompasses the central Rio Grande valley including all of Valencia County, Bernalillo County, and the developed part of southern Sandoval County. The AMPA also includes all, or portions of, several tribal reservations and land grants. Within the AMPA's 3,095 square miles there are 11 incorporated communities, seven Pueblos, and the To'hajiilee chapter of the Navajo Nation.



Source: Connections 2040 Metropolitan Transportation Plan

Figure 2: Albuquerque Metropolitan Planning Area (AMPA) Boundaries

1.4 DOCUMENT AUDIENCE

The audience for this TIM document follows the wide spectrum of TIM functions – law enforcement, fire, emergency medical services, towing and recovery, transportation/traffic, communications, public media, and hazardous material. Stakeholders involved in traffic incident management include public agencies and private companies in addition to the general public. Each TIM stakeholder will have specific roles and interest in the document, with the largest groups being:

- Elected officials
- Metropolitan planning organizations
- Transportation professionals
- Law enforcement
- Emergency responders (fire, medical)
- Transit providers
- Towing and recovery firms
- Commercial vehicle operators and organizations
- Road users/general public

1.5 PLAN METHODOLOGY

The Traffic Incident Management Plan (TIM Plan) was developed based on combination of national research and local analysis and stakeholder involvement. Analysis of existing and historical traffic data within the AMPA region provided a baseline assessment of challenges and opportunities within the roadway network while the national research identified common practices that can be applied to traffic incident management. The specific steps, each described in detail in the subsequent chapters, include:

- Existing Assessment
- National Research
- Stakeholder Interviews
- Stakeholder Workshop

1.6 FUTURE UPDATES

This report is considered the initial Traffic Incident Management Plan (TIM Plan) for the AMPA region. Existing conditions and future recommendation as documented in the report are as of the date of the report. Updates to this report may be necessary are the region progresses and implements TIM strategies. Updates to the report will be managed by the MRCOG ITS Subcommittee.

2 AMPA EXISTING ASSESSMENT

A detailed assessment of baseline conditions within the AMPA related to traffic incidents was prepared under separate cover – *Baseline Assessment for the Incident Management Plan for AMPA (April 2021)*. The *Baseline Assessment* provides a detailed description of the historical crash data, historical available closure data, existing/planned ITS infrastructure, and the traffic impacts of 40 unique roadway closures. An abbreviated summary of the baseline information is provided in this chapter. For more detail on the analysis steps, GIS processes, and results, the reader should refer to the referenced report.

2.1 REGIONAL CRASH TRENDS

Historic crash data was obtained from NMDOT for the most recent full five year range of 2013-2017 to develop summary statistics and determine crash hot spot locations/corridors within the AMPA study area. Raw crash data, provided in a GIS shapefile format, was reviewed and each year of crash data attributes were standardized to consistently use the same field names and field properties. The standardization of the attributes was necessary in order to combine all of the years of data into a single database.

Crash data was subsequently overlaid with a roadway network GIS shapefile based on the spatial positioning and available attribute information. After location verification of the crash records, all crashes were categorized as intersection or corridor related incidents and separated into corridor and intersections layers for the GIS analysis process in order to establish statistics.

To establish crash rates within the network, relevant 2013-2017 traffic volume data was obtained from MRCOG and joined to the roadway network GIS shapefile. Utilizing a spatial join, the traffic data was extracted and added to the corridor and intersection locations.

The following historic crash characteristics were developed using the data obtained from NMDOT and MRCOG:

- Total number of crashes
- Number of crashes that occurred in the AM peak hours (5:00am to 9:00pm)
- Number of crashes that occurred in the PM peak hours (4:00pm to 7:00pm)
- Crash rates
- Number of fatal crashes that occurred
- Measure of severity as equivalent property damage only number of crashes
- Top Crash Type
- Top Contributing Factor

2.1.1 CRASH SUMMARIES

The following maps illustrate the resulting crash analyses relative to total number of crashes, crash rate, and crash severity. Additional maps are provided in the referenced report.

Figure 3 shows the top 50 locations within the AMPA study area based on the total number of crashes between 2013-2017. The top locations were ranked from 1 to 50 in descending order based on frequency.

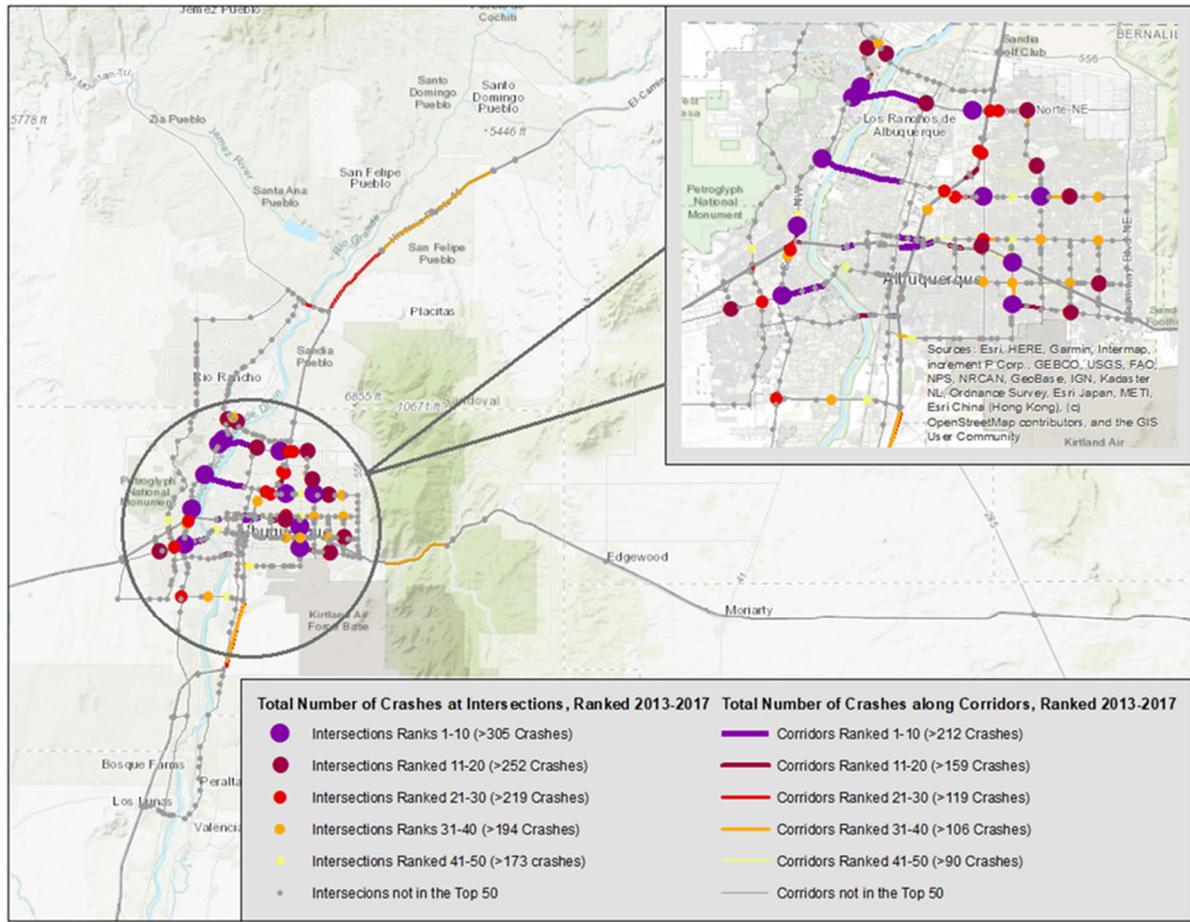


Figure 3: Top 50 Crash Frequency Locations (2013-2017)

As shown in the map, the following areas exhibit high concentrations of segment and/or intersection total number of crashes on The AMPA Network:

- Coors Boulevard Interchange with I-40
- Paseo del Norte River Crossing
- Interchange with I-40 & I-25 (Big I)
- Montañó Road River Crossing and Interchange
- Midtown Albuquerque Area

The corridor with the highest number of crashes is I-40 Westbound through the Big I with a total of 444 crashes from 2013-2017. The intersection with the highest number of crashes was Paseo del Norte at Coors Boulevard with a total of 614 crashes from 2013-2017.

Figure 4 shows the top 50 locations within the AMPA study area based on the crash rate between 2013-2017. The top locations were ranked from 1 to 50 in descending order based on rate.

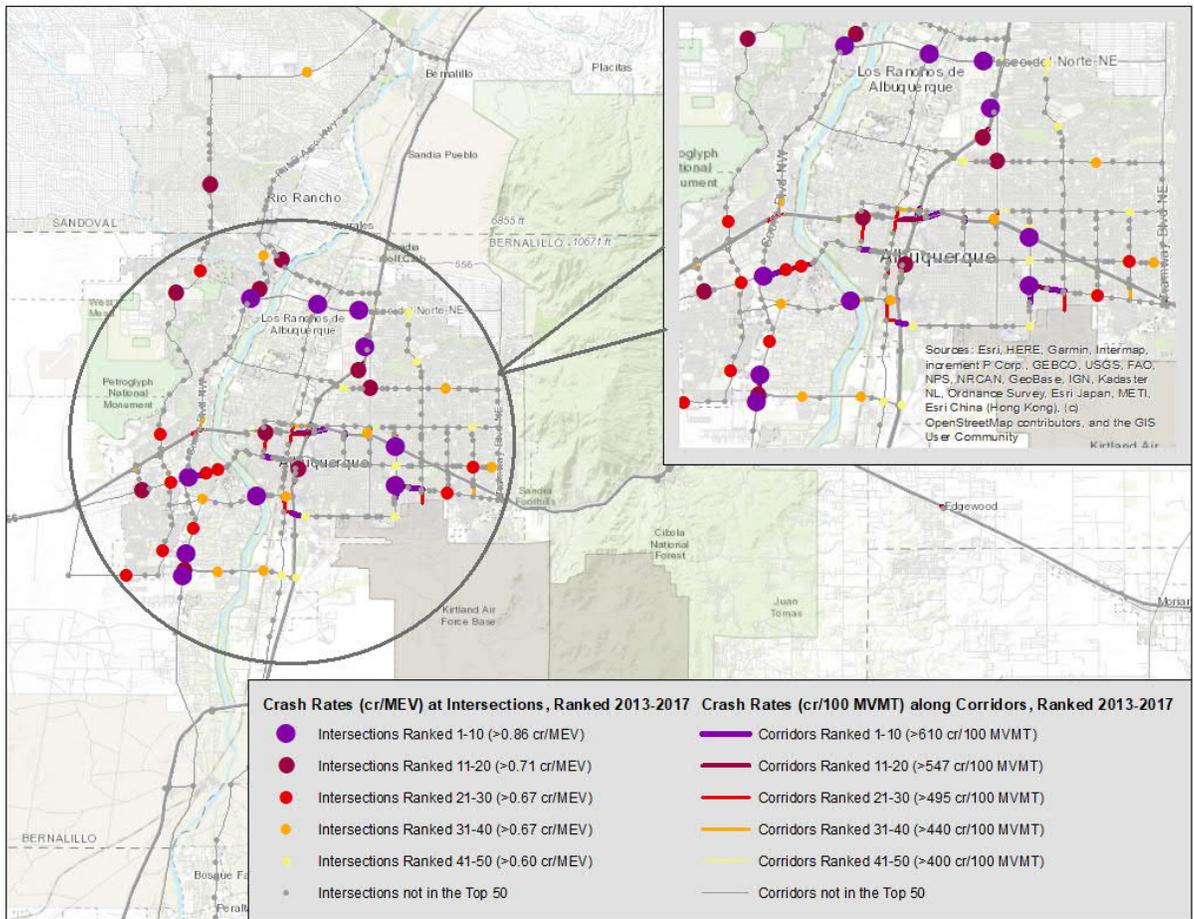


Figure 4: Top 50 Crash Rate Locations (2013-2017)

As shown in the figure, the southwest quadrant of Albuquerque exhibits high concentration of segment and/or intersection crash rates on The AMPA Network. The corridor with the highest average crash rate from 2013-2017 was I-25 Southbound through the Big I with 848.78 crashes per 1000 Million Vehicle Miles Traveled (100 MVMT). The intersection with the highest average crash rate from 2013-2017 was Paseo del Norte at Coors Boulevard with 2.26 crashes per Million Entering Vehicles (MEVs).

Figure 5 shows the top 50 locations within the AMPA study area based on the crash severity between 2013-2017. The top locations were ranked from 1 to 50 in descending order based on Equivalent Property Damage Only (EPDO) crash severity.

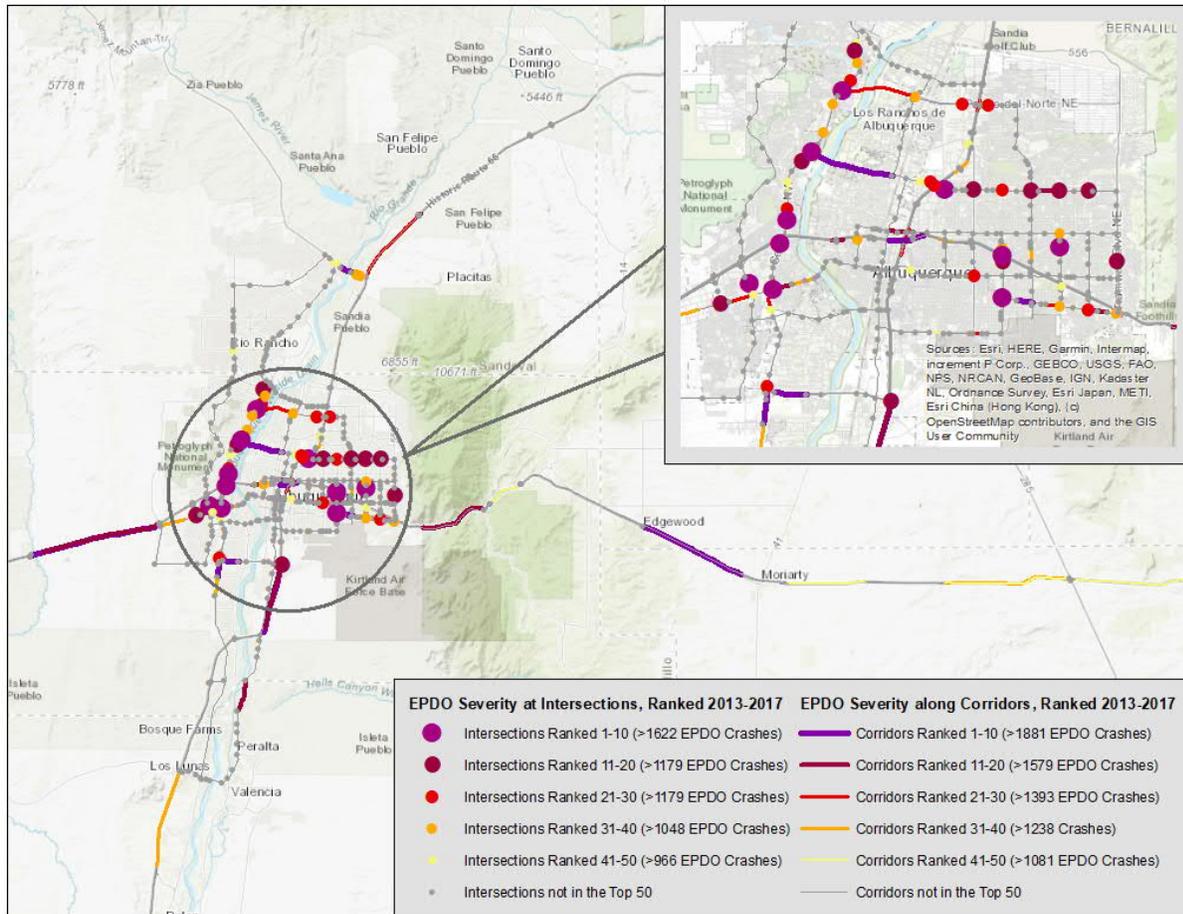


Figure 5: Top 50 Crash Severity Locations (2013-2017)

As shown in the figure above, the following areas exhibit high concentrations of segment and/or intersection EPDO Crashes on The AMPA Network:

- Interchange with I-25 & I-40 (Big I)
- Central Avenue on the eastern side of Albuquerque
- Central Avenue on the western side of Albuquerque
- The Coors Boulevard Corridor
- The Montgomery Boulevard Corridor
- Bernalillo River Crossing
- East Mountains

The corridor with the highest number of EPDO Crashes from 2013-2017 was I-40 WB through the Big I with 2,252 EPDO crashes. The intersection with the highest number of EPDO Crashes from 2013-2017 was Paseo del Norte @ Coors Boulevard with 2,865 EPDO crashes that occurred in the study period.

2.2 REGIONAL ROAD CLOSURES

The project team coordinated with AMPA stakeholder agencies to identify previous special event, crash, and weather-related closures along major roadways and identify how each agency handled these past events. Meetings were individually held with each agency to collect anecdotes and request data on past events. Unfortunately, there are few formal systems that record such events outside the NMDOT TMC and, as such, available documentation of past closures was not comprehensive. While the New Mexico Uniform Crash Report does include “time roadway cleared” and “time incident cleared” fields, there are not searchable attributes related to roadway closure actions.

One readily available data source is the activity log for the NMDOT Courtesy Patrol. The NMDOT ITS Bureau provided the Courtesy Patrol Truck Incident Logs from 2013 through March 2020 which indicate responses to help clear or remove incidents that impede traffic flow along the interstates (I-25, I-40) and expressways (Paseo del Norte). This information was processed and used to create a spatial heat map of incidents. **Figure 6** shows a heat map of where the Courtesy Patrol was deployed to assist incidents. It should be noted that this map is based on a limited set of data from the NMDOT Courtesy Patrol which operates only on major NMDOT roadways and only 6:00 AM - 6:45 PM Monday through Friday. Similarly, the data does not indicate the closure extents or duration.

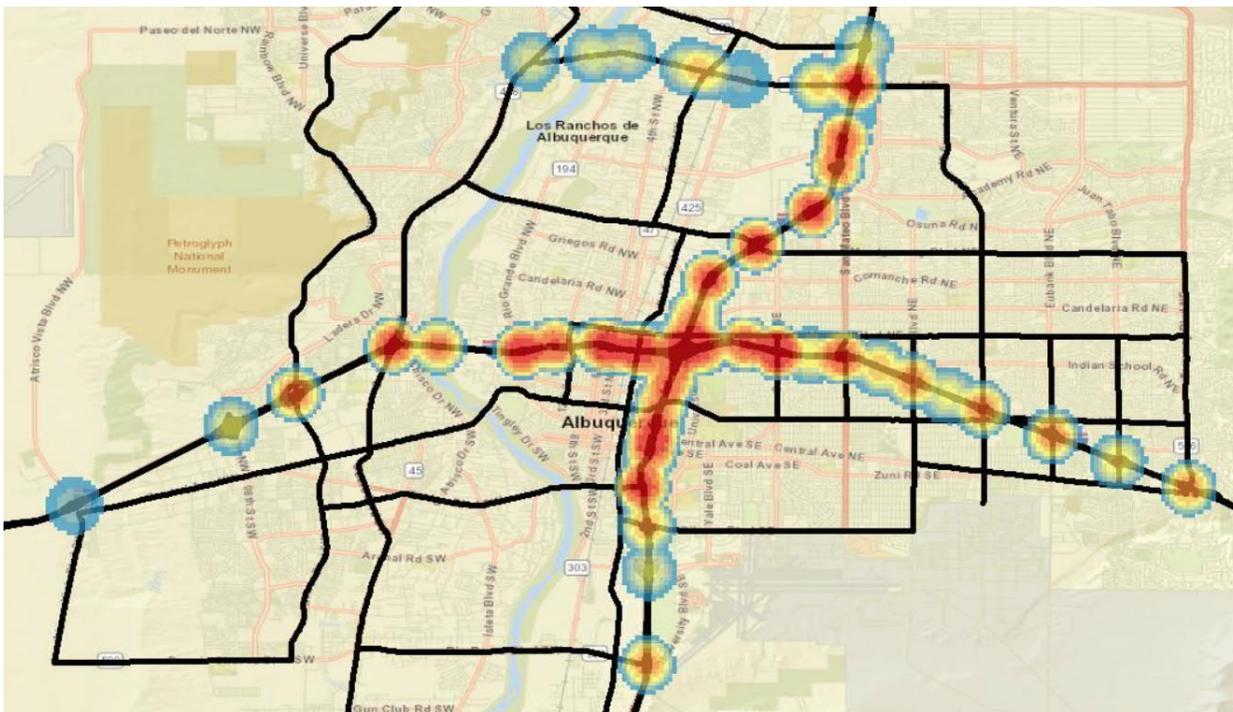


Figure 6: NMDOT Courtesy Patrol Activity (2013-2020)

In terms of response to major closures, each agency has a differing strategy. The following strategies are based on the individual agency interviews held in February 2020.

- NMDOT has incident management/detour plans for a few key locations.
- Bernalillo County does not have detour plans for closures but is concerned about communities with limited access, either due to terrain (canyons) or infrastructure (railroad).
- City of Albuquerque does not have standardized detour plans.

2.3 INCIDENT TRAFFIC DIVERSION

Traffic incidents can impact traffic operations on adjacent roadways if a significant amount of traffic reroutes due to lane closures and delay. To identify the relative magnitude of rerouting, the MRCOG 2040 regional travel demand model was used to assess changes in traffic patterns associated with full and partial roadway closures. A total of 22 roadway segments were chosen to evaluate – 10 river crossings and 12 mainline locations. These segments are listed in **Figure 7** and geographically shown in **Figure 8**.

Site ID	Site Name
1	I 25 north of 550
2	River Crossing: US 550
3	NM 333
4	I 40 at the Tijeras Canyon
5	River Crossing: NM 6
6	River Crossing: I 25
7	I 25 south of Rio Bravo
8	River Crossing: Rio Bravo
9	River Crossing: Bridge Blvd
10	River Crossing: Central Ave
11	I 40 at Coors Blvd
12	Coors Blvd north of I 40
13	River Crossing: Montano Rd
14	River Crossing: Paseo del Norte Blvd
15	Coors Blvd north of Paseo del Norte Blvd
16	River Crossing: Alameda Blvd
17	I 25 at Jefferson St
18	I 40 west of Big I
19	I 40 at the Big I
20	I 25 at the Big I
21	I 40 at Carlisle Blvd
22	I 40 at Wyoming Blvd

Figure 7: List of Closure Locations for Modeling

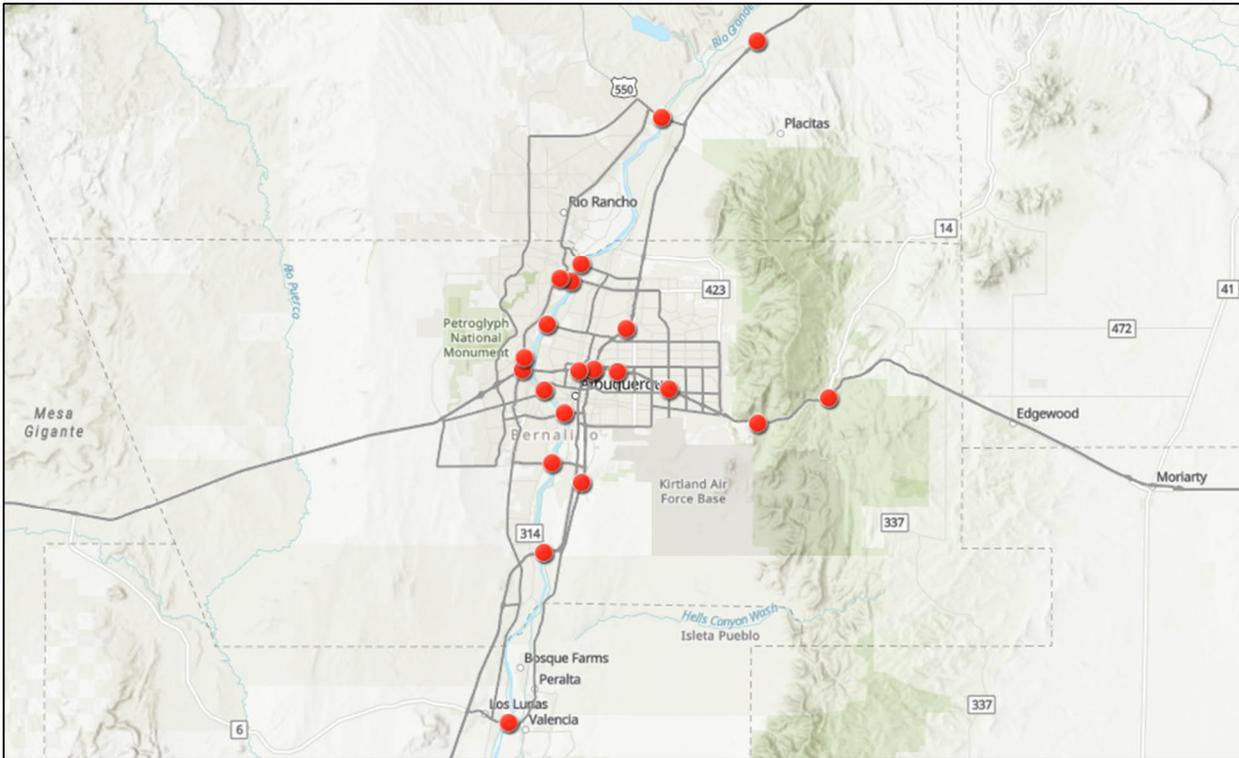


Figure 8: Map of Closure Locations for Modeling

2.3.1 AMPA MODELING RESULTS

The roadway closures listed above were modeled using the MRCOG 2040 regional travel demand model for both full closures and partial closures. The regional model is a macroscopic model that provides volume projections based on a 4-step process including trip generation, trip distribution, mode choice, and trip assignment. The model land use inputs are aggregated based on the roadway network and access points while the roadway network is largely focused on collector roads and higher classifications. During the model development, the parameters are calibrated using available baseline local traffic data.

Modeling results for each closure scenario were run for morning and evening peak periods and compared to the corresponding modeling results under normal roadway conditions to determine the relative magnitude of volume change (rerouting) caused by the incident. It should be noted that the regional model is for planning efforts only and does not illustrate potential operational impacts as the model is not capacity-constrained and does not include traffic control devices such as traffic signals that may introduce delay. Detailed modeling results and maps for each closure are provided in the *Baseline Assessment (April 2021)*.

Summaries of each scenario are provided below.

MAINLINE CLOSURES

For mainline closures, the modeling results were summarized by the potential impact to adjacent routes and adjacent interchanges. The extent of those impacts in terms of distance are also provided for relative comparison. **Figure 9** shows the results of the full closure scenarios. In terms of impacts to adjacent interchanges, those closures that occur at or near the I-25/I-40 system interchange may result in the redistribution of traffic to more interchanges due to the denser grid in the immediate area. In terms of distance, those closures that may result in the longest

redistribution of traffic are those on the periphery of the urban area where the roadway network and interchange spacing is less dense, such as I-25 south of NM 500 (Rio Bravo).

Roadway (Closure location)	Adjacent Roadways Impacted	Number of Interchanges Impacted	Estimated Impact Distance
Coors Blvd (North of I-40)	NM 347 local roads	n/a	< 1 mile
Coors Blvd (North of NM 423)	NM 423, NM 528 Golf Course Road, local roads	n/a	< 2 miles
I-25 (South of NM 500)	NM 47 local roads	2	5 miles
I-25 (North of I-40)	NM 47, NM 528, NM 423 Montano Road, local roads	6	< 4 miles
I-40 (West of I-25 interchange)	NM 47 Lomas Blvd, local roads	8	< 4 miles
I-40 (East of I-25 interchange)	Lomas Blvd, local roads	7	< 4 miles
I-40 @ Tijeras Canyon (East of NM 556)	NM 333	2	2 miles
I-40 (East AMPA)	Central Avenue, Lomas Blvd, local roads	3	< 4 miles
I-40 at I-25	Lomas Blvd, local roads	5	< 3 miles
I-25 at I-40	NM 47 frontage road, local roads	5	< 3 miles
I-40 (East of NM 337)	NM 333 Zamora Rd	2	3 miles

Figure 9: Modeled Mainline Closure Impacts

Modeling results for partial closures showed little traffic diversion to adjacent roadways likely due to the limitations of the regional model as previously described. A review of 3rd party probe data associated with known historic traffic incidents indicate that partial closures result in short periods of slower traffic. Operational impacts, such as queuing effects, are not fully known.

RIVER CROSSING CLOSURES

For river crossing closures, the modeling results were summarized by the potential impact to adjacent routes and adjacent river crossings. The extent of those impacts in terms of distance are also provided for relative comparison. **Figure 10** shows the results of the full closure scenarios. In terms of impacts to adjacent river crossings, most river crossing closures result in redistribution of traffic to multiple river crossings due to the roadway network layout and capacity constraints. In terms of distance, those closures that may result in the longest redistribution of traffic are those on the periphery of the urban area where the roadway network and river crossing spacing is less frequent.

Roadway	Adjacent Roadways Impacted	Adjacent River Crossings Used	Estimated Impact Distance
NM 6 (Main Street)	I-25, NM 47	I-25, NM 147, NM 309	11 miles N, 11 miles S
I-25	NM 45, NM 314, NM 47	NM 500, NM 147, NM 6	5 miles N, 10 miles S
NM 500 (Rio Bravo Blvd)	I-25, NM 45, NM 314	I-25, I-40 Central, Bridge	6 miles N, 5 miles S
Bridge Boulevard	I-25, NM 45, NM 314	I-25, I-40, NM 500 Central	3 miles N, 8 miles S
Central Avenue	I-25, NM 45, NM 314	I-40, NM 500 Bridge	1 miles N, 4 miles S
I-40	NM 345, NM 45, NM 314, NM 47 Atrisco Vista Blvd, 98th St	I-25, NM 528, NM 423, NM 500 Montano Road, Central, Bridge	7 miles N, 11 miles S
Montano Road	NM 345, NM 45, NM 47	I-40, NM 528, NM 423	4 miles N, 3 miles S
NM 423 (Paseo Del Norte)	I-25, NM 345, NM 45, NM 47	I-40, NM 528 Montano, Central, Bridge	1 miles N, 9 miles S
NM 528 (Alameda Blvd)	I-25, NM 345, NM 45, NM 47	I-40, NM 550, NM 423 Montano	11 miles N, 7 miles S
NM 550	I-25, NM 345, NM 45, NM 47 NM 347, NM 528, NM 448, NM 313 Atrisco Vista Blvd, Golf Course Road	I-40, NM 528, NM 423 Montano, Central	0 miles N, 19 miles S

Figure 10: Modeled River Crossing Closure Impacts

Similar to mainline partial closures, modeling results for partial closures of river crossings showed little traffic diversion to adjacent roadways likely due to the limitations of the regional model as previously described. A review of 3rd party probe data associated with known historic traffic incidents indicate that partial closures result in short periods of slower traffic. Operational impacts, such as queuing effects, are not fully known.

2.4 EXISTING ITS DEVICES

An inventory of the existing intelligent transportation systems (ITS) devices throughout the AMPA study area was developed based on data provided by MRCOG and stakeholder agencies. Additionally, any current plans for future ITS devices were identified. The focus of the ITS inventory was on features that could support incident response efforts through detection or public notification.

The following types of ITS were included in the inventory:

- Traffic signals: Signalized traffic control installed at at-grade intersections.
- Dynamic Message Signs (DMS): Electronic message boards that can display changeable messages to the roadway user. Typically installed overhead for vehicular drivers.
- Closed Circuit Television (CCTV) cameras: Video cameras that capture and transmit live video of roadway segments or at-grade intersections. Typically have pan, tilt, and zoom control features.
- Roadway Weather Information Systems (RWIS): Weather-focused instrumentation that is installed along the roadside in areas where weather is a concern. Can transmit data on temperature, precipitation, wind, and other weather features.

- Vehicle detection: Equipment that is installed (overhead, in pavement, side of road, or other) for the purpose of detecting vehicle passage or presence. Can be based on a number of technologies and installed along a roadway segment or at an intersection. Vehicle detection data can be used for a variety of purposes either in real-time or from an archive or data warehouse.
- Advanced communications network: Installations of fiber-optics, radar, or other technologies that connect ITS infrastructure devices to common communication points. The network allows remote access and control of features including data collection and real-time operations. Per MRCOG data, the AMPA region has 295 miles of advanced communications network as of 2018/2019.

Figure 11 summarizes the ITS inventory by agency owner based on the data received.

	Traffic Signals	DMS	CCTV	RWIS	Vehicle Detection
NMDOT (total)	15	68	107	2	70
(interstate)	0	31	86	2	67
(other)	15	37	21	0	3
City of Albuquerque	708	11	224	-	32
City of Rio Rancho	60	-	11	-	10
Bernalillo County	56	-	19	-	

Figure 11: Existing AMPA ITS Inventory

The above ITS inventory, namely DMS and CCTV installations, were reviewed to determine the average coverage density. For each agency, the number of ITS devices were compared to the length of applicable miles of roadway along which devices are installed (not the entire network). The following factors are important to note regarding the averages: roadway mileage and ITS devices only reflect those locations where the ITS installations are present and calculations are reasonable, roadway segments for CCTV coverage are assumed bidirectional (single) as CCTV cameras can pan and tilt, and roadway segments for DMS coverage are doubled in length as DMS are visible in only a single direction. The following are the sample averages:

- NMDOT (I-25, I-40)
 - CCTV: Average mainline density along the interstates is one camera per 1.2 miles throughout AMPA region. Within the urban core, the density is one camera per 0.58 miles.
 - DMS (Mainline): Average mainline density along the interstates is one DMS per 7.4 miles throughout the AMPA region. Within the urban core, the density is one DMS per 3.5 miles (this spacing considers only those DMS installed on the mainline and not adjacent DMS on arterials)
 - DMS (Mainline + Arterial): Average total density (including mainline and arterial approaches) is one DMS per 3.2 miles throughout the AMPA region when interchanges are included. Within the urban core, the density is one DMS per 1.3 miles when interchanges are included.
- Bernalillo County
 - CCTV: Average density is one camera per 0.42 miles, roughly every ½ mile major intersection, on those arterials where cameras have been installed (Paseo del Norte, Coors Blvd, Isleta Blvd).

- City of Albuquerque
 - CCTV: Average density is one camera per 0.47 miles, roughly every ½ mile major intersection, on those arterials where cameras have been installed (fiber optic equipped corridors).
 - DMS: Few DMS along corridors, mainly located approaching interchanges (see NMDOT)
- City of Rio Rancho
 - CCTV: Average density of one camera per 0.8 miles along Unser Blvd.

The above inventory is a summary of the physical installations and does not represent the operational status. Individual ITS devices may not be functional due to age (end of lifecycle), damage, missing communication links, staffing challenges, or other factors.

2.4.1 EXISTING GAPS IN COVERAGE

In general, CCTV and DMS coverage within the AMPA roadway network is very consistent and thorough. The CCTV and DMS locations were reviewed for possible gaps in coverage based on the roadway network and associated decision points during an incident. Possible locations that agencies should evaluate for additional ITS devices include:

- CCTV (~14 additional)
 - 1 CCTV on I-25 south of the metropolitan area – There is currently a 7 mile gap in CCTV coverage on I-25 between Isleta Boulevard and NM 6 due to Isleta Tribal restrictions. Adding a camera along this segment could improve situational awareness between two major interchanges.
 - 1 CCTV on NM 6 near Las Lunas/Valencia – Modeling efforts as part of this study indicate heavy use of the NM 6 (Main Street) interchange and NM 47 during several I-25 closure scenarios, particularly the Rio Grande river crossing. Adding a camera along this route near the southern portion (Rio Grande, railroad, alignment curve) could improve situational awareness.
 - 1 CCTV on I-25 near Rio Rancho (Sandia Pueblo) – There is currently a 5.5 mile gap in CCTV coverage on I-25 between NM 556 (Tramway Boulevard) and US 550 due to Sandia Pueblo Tribal restrictions. This is significantly greater than the metropolitan average.
 - 1 CCTV on NM 556 (Tramway Road) – Tramway Boulevard is a major route linking I-40 and I-25 in the NE quadrant. Currently, there are no cameras between I-25 and Paseo del Norte. Installing at least one camera along this 6 mile segment could improve awareness of traffic conditions. This new camera, in addition to a recent camera installed at Tramway Road/Paseo del Norte, would result in one camera installation on either side of the alignment curve.
 - 10 CCTV on major local roadways (Bridge Boulevard, Lomas Boulevard, San Mateo, Alameda Boulevard) – There are several regional arterials and collectors that are shown to be heavily used in the regional modeling efforts prepared for this study. Significant gaps in existing camera coverage have been identified in the inventory. Adding new cameras to existing signalized intersections along these routes can provide increased awareness of traffic conditions. It is recommended to add cameras to the major grid intersections at a minimum.
- DMS (~4 additional)
 - 1 DMS on Mainline Eastbound I-40, east side of the metropolitan area – East of I-25, there are numerous DMS for mainline westbound I-40 traffic entering the metropolitan area. However, the easternmost DMS for mainline eastbound I-40 is located prior to the Wyoming Boulevard interchange without another mainline eastbound DMS until beyond the Bernalillo County boundary. Adding another DMS for mainline eastbound I-40 traffic just prior to NM 556 (Tramway Boulevard) could provide a reminder or additional traveler information before

interchange spacing becomes limited in the more rural and mountainous terrain. It should be noted that there are DMS installed in this segment on the interchange approaches but not visible for mainline traffic.

- 1 DMS on Mainline Northbound I-25 near Rio Rancho – North of I-40, the northernmost DMS for mainline northbound I-25 is located prior to the Alameda Boulevard interchange. Adding another DMS for mainline northbound I-25 traffic just prior to US 550 could provide a reminder or additional traveler information before interchange spacing becomes limited in the more rural areas. It should be noted that there are DMS installed in this segment on the interchange approaches but not visible for mainline traffic. (NMDOT has indicated that there are plans to install the recommended DMS in the 2021/2022 timeframe.)
- 2 DMS on NM 556 (Tramway Boulevard) – Tramway Boulevard is a major route linking I-40 and I-25 in the NE quadrant. Currently, there is only one DMS along the entire 13 mile roadway and that is located on the approach to the I-40 interchange. Installing one DMS in each direction on the approach to NM 423 (Paseo del Norte Boulevard) would provide traveler information at a key decision point.

3 NATIONAL EFFECTIVE TIM PRACTICES

3.1 NATIONAL REFERENCES

Traffic incident management is practiced in every State and jurisdiction and is a required response to provide medical attention, serve the public, and maintain or restore roadway operations during and after an incident. As such, there has been a significant effort at the national level to develop guidance and establish common practices to ensure consistency across jurisdictional boundaries. Due to the numerous types of responders and professionals involved in traffic incident management, guidance has been developed from various agencies and targeted to various groups, such as transportation professionals, law enforcement, medical responders, and towing providers.

3.1.1 TECHNICAL RESOURCES

The following guidance documents were reviewed as part of this effort:

- Federal Highway Administration (FHWA)
 - Best Practices in Traffic Incident Management (Sept 2010)
 - Traffic Incident Management Handbook (Jan 2010)
 - Traffic Incident Management Gap Analysis Primer (March 2015)
 - Freeway Management and Operations Handbook (Sept 2003)
 - Traffic Incident Management Capability Maturity Self-Assessment National Analysis Report (Nov 2018)
 - SHRP2 National Traffic Incident Management Responder Training Program (L12/L32A/L32B)
- National Highway Institute (NHI)
 - National Traffic Incident Management Responder Training
- Federal Emergency Management Agency (FEMA) Emergency Management Institute (EMI)
 - Incident Command System (ICS) 300 Training
 - National Incident Management System (NIMS) (Oct 2017)
- AASHTO National Traffic Incident Management Coalition (NTIMC)
 - National Unified Goal (NUG) – 18 strategies
 - Multidisciplinary TIM Core Competencies
- American Traffic Safety Services Association (ATSSA)
 - Incident Traffic Control for Responders Training
- Towing Recovery Association of America (TRAA)
 - Vehicle Identification Reference Guide

3.1.2 ORGANIZATION

Information collected from the above resources were reviewed and combined into a set of common practices for traffic incident management. The organization of the common practices, as provided below, is based on a combination of when the practice would be implemented, who would be involved, and where it would occur.

- On-Scene Emergency Response and Safety
- Traffic Management Tools and Technology
- TIM Planning and Training
- TIM Awareness, Education, and Outreach
- Legislation

3.2 NATIONAL PRACTICES

Each of the above categories contains multiple effective practices that contribute to the overall TIM effort. Each practice is listed below with an associated description included in the Appendix.

3.2.1 ON-SCENE EMERGENCY RESPONSE AND SAFETY

Responder Communication and Coordination: Incident Command System, Contact Lists, Response Matrix, Reference Location Signs

Responder Visibility and Scene Safety: Emergency Vehicle Lighting, Incident Scene Illumination, Emergency Vehicle Markings

Crash Reconstruction and Investigation: Total Stations, Photogrammetry, Unmanned Aerial Vehicles/Drones, Medical Examiner Coordination and Procedures

Quick Clearance and Removal Operations: Towing and Recovery Contracts, Towing and Recovery Incentives, Vehicle-Mounted Push Bumpers, Pre-Positioned Emergency Equipment

3.2.2 TRAFFIC MANAGEMENT TOOLS AND TECHNOLOGY

Multi-agency Coordination: Joint TMC/EMC, Advanced Traffic Management System Software, Computer Aided Dispatch, Common Mutual-Aid Radio Frequencies/Channel, Data/Video Sharing

Event Detection & Reporting: Closed-circuit television cameras, Road weather information systems, Traffic detection

Traveler Information: 511 Traveler Information System, Portable Changeable Message Signs, Fixed Dynamic Message Signs, End of Queue Notification / Lane control Signs

Incident Response and Traffic Management: Safety service patrols, Motorcycle patrols, Ramp Meters, Traffic Signal Connectivity and Enhancements, Emergency Vehicle Turn Around/Median Breaks

3.2.3 TIM PLANNING AND TRAINING

TIM planning: TIM Strategic Plan, Alternate Route Plans, Table-Top Exercises, After Action Reviews

Responder Training: National TIM Training, TIM Responder Certifications, Train-the-Trainer, Response Vehicle Positioning/Parking Plans, Hazardous Materials Identification, Towing and Recovery Vehicle ID Guide

3.2.4 TIM AWARENESS, EDUCATION, AND OUTREACH

Public Education: Media Education Tools, Public-Private Partnerships

Upper Management Engagement: Performance Management, Annual TIM self-assessment, Link performance with funding

3.2.5 LEGISLATION

TIM Legislation: Authority Removal Laws, Driver Removal Laws (Steer it, Clear it), Abandoned Vehicle Laws, Slow Down/Move Over Laws

4 AMPA CURRENT TIM PRACTICES

4.1 INTERVIEWS

Traffic incident management efforts in the Albuquerque Metropolitan Area involve numerous stakeholder agencies. To develop a baseline assessment of current efforts, the project team held 1-on-1 interviews with each agency to obtain a general overview of traffic incident management within the agency and with partnering agencies. These interviews were not prescriptive and did not follow a rigid questionnaire but generally covered the primary categories of TIM listed in the previous chapter.

The interviews conducted included both transportation professionals and law enforcement as follows:

- Mid Region Council of Governments (MRCOG)
- New Mexico Department of Transportation (NMDOT)
- New Mexico Department of Public Safety (DPS)
- Bernalillo County Public Works
- Sandoval County Sheriff
- City of Albuquerque Department of Municipal Development
- City of Albuquerque Police
- City of Rio Rancho Public Works
- City of Rio Rancho Police

4.2 SUMMARY

Rather than provide individual summaries of each agency, a summary of the current efforts within the entire Albuquerque Metropolitan Area is provided below.

4.2.1 ON-SCENE EMERGENCY RESPONSE AND SAFETY

RESPONDER COMMUNICATION AND COORDINATION

Efficient and effective communication is essential during traffic incident management and most agencies within the Albuquerque area indicate that communication is adequate. While there is not a fully interoperable communication platform, the agencies are able to communicate and follow Incident Command System (ICS) during active incidents. Communication during incidents is typically through dispatch (radio) and/or cell phones. Otherwise, personal/verbal communication is fine on small scenes.

Aside from real-time incident communication, planned coordination between agencies is relatively ad-hoc and there is little coordination on traffic operational issues. Most coordination is related to planned events like construction, maintenance, or special events which may have impacts on an adjacent agency. Local agencies report a good working relationship with their peers but staffing constraints limit the availability to be proactive. The relative size of the region results in fewer number of stakeholders and everybody knows who to contact and how to contact them – most rely on personal relationships rather than formal processes.

Reference sign locations are provided along the interstate routes via mile markers and along arterials and collectors via intersection road name signs. Within the metropolitan area, the State has installed mile markers at 2/10 mile spacing. Local agencies currently do not see a need for a similar system off the interstate beyond the traditional street naming convention.

RESPONDER VISIBILITY AND SCENE SAFETY

Officer safety during incidents requires appropriate tools and use of those tools. All Albuquerque officers rely on personal fluorescent jackets/vests and the lights installed on their vehicles for visibility at the scene. If incidents require additional lighting during nighttime events, many agencies have access to light globes and generators through their police or public works departments.

Depending on their vehicle, some officers have traffic cones (either paired with lights or flares) though availability is generally limited. For motorcycle units and/or local road incidents, traffic control is primarily done at a small scale and relies on hand signals, whistle, wands, and vehicle positioning. For larger traffic control, the DOT or Public Works departments will setup temporary traffic control and establish detours. These departments typically bring barrels, signs, and portable DMS though some agencies rely on outside services to provide incident traffic control as devices owned by maintenance crews are often vandalized or stolen.

CRASH RECONSTRUCTION AND INVESTIGATION

Crash reconstruction is not performed on all incidents but typically is for severe incidents (those involving major injuries or fatalities). Those involved are usually specially trained (i.e., a traffic reconstruction unit) and have dedicated equipment for collecting data for investigations. At a minimum, photos and measurements (distance wheel, total stations) are collected as well as the vehicle black box information. Some agencies have advanced equipment such as a 3D scanner which takes photos, measurements, and scans a point cloud. While that scanner is now the primary tool for investigation in one agency, it hasn't saved time over traditional methods but it is more accurate and complete. Several agencies have started using drones to gather data during incidents but it has only been used in large scenes and is limited to collecting photos and video.

Fatalities require the notification of the Office of Medical Investigators (OMI) to investigate and transport the body. As a matter of practice, law enforcement doesn't move the vehicle until OMI is on-scene and removes the body. The rare exception is when Fire/EMT believes that there is a possibility to revive the person. The OMI process to access the scene and remove bodies can take between 2 and 4 hours. Cause of death and toxicology results can take up to 9 months after the crash.

QUICK CLEARANCE AND REMOVAL OPERATIONS

Responding law enforcement officers are typically allowed to push disabled vehicles from travel lanes using the push bumpers installed on patrol cars. However, most agencies have internal guidance to limit vehicular damage and effectively push only vehicles that are mobile (little wheel damage). Depending on the agency, officers may need to get supervisor approval to move vehicles from the lane.

Towing and recovery is largely coordinated through law enforcement agencies using contracted services. Typically, there are 3-5 companies approved for on-call vehicle removal and scene clean-up that the agencies rotate through for assistance. In instances where there are heavy vehicles involved, there may only be 1 or 2 companies available with the specialty equipment. Dispatch typically makes the request after receiving notification from the responding officers. Many of the contracts have a performance standard based on initial response time.

Transportation agencies also have a number of physical resources that can support traffic incident management including heavy trucks/equipment. Occasionally transportation agencies are requested to use their heavy equipment to remove stuck vehicles or downed infrastructure (signal poles). There have been limited instances of pre-positioning vehicles/equipment though some agencies maintain a mobile trailer stocked with necessary supplies.

4.2.2 TRAFFIC MANAGEMENT TOOLS AND TECHNOLOGY

MULTI-AGENCY COORDINATION

The NMDOT, which currently operates a Statewide Traffic Management Center (TMC) in Albuquerque, typically has a total of 6 to 8 operators who staff the center throughout the operating hours of 6:00 AM to 8:00 PM. Outside those hours, the operators rotate on-call status and can access the TMC remotely if called or requested.

Local agencies also operate traffic management centers either through physical or virtual TMC workstations though most local agencies do not have dedicated operators. Most agencies use the workstations to access cameras and traffic signals as issues arise. A new Regional TMC opened in early 2021 with initial occupancy comprised of NMDOT staff and other local agencies joining the Regional TMC in various phases in the future. It is envisioned that the joint staffing of the Regional TMC will improve inter-agency coordination but each agency may continue to operate with separate standard operating procedures.

Incident reporting is typically done through public calls to 9-1-1. Outside reports from the public, the DPS units have direct communication to the NMDOT TMC and can notify operators of incidents and coordinate response. The dispatch center then notifies the corresponding agency responsible for incident response. If it occurs after hours, an on-call officer may be assigned or another agency may cover. At the local level, transportation agencies are not typically notified of traffic incidents unless there is damage or failure to traffic signals that need immediate repair.

Communication between law enforcement agencies (State, County, local) is somewhat difficult as each use different radio frequencies. All fire departments are on a separate radio system from law enforcement but they can be reached through the regional dispatch center. Communication during incidents is typically through dispatch (radio and CAD) for initial or official calls but officers try to keep radio traffic to a minimum and use cell phones for most tactical coordination on scene.

An interoperable system is being developed which will upgrade the communication towers and radios to allow a common frequency. The project, funded through a grant, is not anticipated to be fully operational for several years. Currently, agencies use cell phones to coordinate and circumvent the interoperability issues. This approach can be effective in certain circumstances (small incident, central area) but loses effectiveness with staff turnover and law enforcement rotations, during large incidents, or in areas with poor cellular service.

Inter-agency coordination occurs on many of the shared roadways though there are not always written agreements – agencies share in the patrol/response as needed. For example, Sandoval County Sheriff patrols both incorporated and unincorporated areas and respond to I-25 for the State. If there is a need for a joint investigation, they will notify the partner agency. Similarly, the City of Rio Rancho patrols several major State routes – SR 347, SR 528, and US 550. Conversely, NMDPS typically takes the lead on large, unusual events – and anything involving animals or hazmat.

Data sharing between agencies is relatively limited. The camera video feeds available on NMRoads is available to all agencies though only through a website environment. Direct connection between networks has proven more difficult, though some access is available through VPN access. There are not significant data sharing efforts for other data though stakeholders are receptive of the additional information, particularly traffic volume.

EVENT DETECTION & REPORTING

The Albuquerque region has invested a significant amount of money installing field equipment to support traffic incident management. Surveillance is possible through traffic cameras installed along the freeways and many signalized intersections, though there are some gaps in coverage on the freeway and some areas are not visible in both directions. Within each agency, the video is accessible at the respective TMC and via remote access. The NMDOT freeway camera feeds are also accessible online through the NMRoads website. In addition to manual surveillance, 3rd party probe data, and video analytics has been utilized to assist in traffic operations and incident detection. Agencies reported little need for vehicle-mounted cameras, such as on Courtesy Patrol or snow plows.

Road weather information systems (RWIS) are installed on the peripheries of the metropolitan area where weather event data is more of a concern. The NMDOT is in the process of installing two additional RWIS sites also on the periphery of the urbanized areas.

TRAVELER INFORMATION

Within Albuquerque, there are approximately 70 permanent dynamic message signs (DMS) installed to provide traveler information with more being planned. Most of these are either along the major freeways (I-25 and I-40) or on major arterials adjacent to the freeways. In addition, portable message boards are used if incidents are longer duration and either in an area without DMS or require additional messaging.

Communication with the public is primarily done through the use of permanent DMS, portable DMS, the 511 phone system, and NMRoads website. These systems allow one-way information sharing to the public about traffic incidents, road closures, travel times, and other conditions. Communication can also be handled through media releases and social media platforms managed by the Public Information Officers (PIO). In many jurisdictions, there may be more than one PIO group – one in Law Enforcement/Fire and another in DOT/Public Works/Traffic.

INCIDENT RESPONSE AND TRAFFIC MANAGEMENT

The State operates a Courtesy Patrol service to move disabled vehicles and assist with incidents on the Interstates within the metro boundaries. There are currently 8 patrol vehicles that operate on a rotating schedule between 6:00 AM and 6:00 PM, Monday through Friday. The overlapping schedules allow the following coverage: 3 vehicles in the AM, 5-6 vehicles midday, and 3 vehicles in the PM.

Motorcycle patrols are common within most of the law enforcement groups. Several agencies that do not have motorcycle units are in the process of obtaining motorcycles and associated equipment.

Traffic signal operations are limited to at-grade intersections as ramp metering has not been implemented along interstates in AMPA. On the arterial side, traffic signal control has been upgraded along many corridors to allow remote access for troubleshooting and signal timing changes. The management of these traffic signals is done within individual Advanced Traffic Management System (ATMS) platforms within each agency. Currently, the different vendor platforms do not interface with each other. In addition to connectivity, several agencies are expanding operational capabilities to include adaptive signal control, Bluetooth sensors, and signal phase and timing (SPAT) messaging. While these implementations are currently limited to just a few corridors, there are additional corridors planned in the next few years. Staffing availability has been identified as a limitation to actively manage and operate these systems.

In most cases, road closures are decided by law enforcement. For example, DPS may make the decision to block lanes and/or divert traffic with NMDOT assisting with implementation of traffic control. Local agencies are similar in that law enforcement will initiate the closure and the traffic group (or Public Works) may follow with adjustments.

Freeway segments that have limited access points and turn around opportunities require special focus. NMDOT has recently studied I-40 west of the Rio Grande to evaluate options for emergency access/turn-arounds during incidents. A similar effort was completed on I-25 north of I-40 to provide access opportunities when cable barrier was installed.

4.2.3 TIM PLANNING AND TRAINING

TIM PLANNING

Agencies operating within the Albuquerque metropolitan area have limited formal planning efforts for traffic incident management. Regional coordination is largely conducted through recurring quarterly meetings between agencies to discuss traffic issues ranging from operations, safety, and projects. Studies and planning documents,

when conducted, are typically limited to individual agencies or focused on infrastructure with secondary focus on traffic incident response.

Recurring quarterly meetings between NMDOT, DPS, and local agencies are held to discuss upcoming projects and traffic safety concerns. The coordination effort is split into three metro area meetings – northern, central, and southern. The purpose of the meetings is to coordinate efforts between engineering and enforcement across all agencies. Topics may include review of recent crash activity, near-term infrastructure mitigation options (such as signal timing), and law enforcement needs.

Regional planning studies and documents are generally led by MRCOG as the regional planning organization. Most studies are prepared in support of infrastructure projects and feed into the programming cycle, from the Metropolitan Transportation Plan (MTP) to the 4-year federal Transportation Improvement Plan. While some of these agency-led projects will help in traffic incident management, there are no specific regional planning efforts dedicated to traffic incident management.

While agencies may not have formal traffic incident management plans, there have been planning efforts prepared for specific issues. Special event planning, such as the annual Balloon Fiesta and a recent Presidential visit, are more aligned to managing event traffic and not necessarily incidents but there may be common aspects that could be shared. In addition, winter operations planning typically involves coordination between traffic maintenance crews and first responders to review freeway closure procedures and impacts. The coordination developed in these meetings may be applicable to other incident management scenarios.

Outside traffic incident management, there are a number of planning documents covering emergency operations, hazard mitigation, continuity of operations (COOP), and emergency support functions (ESF) developed at the County level. While transportation has a role in these efforts, there is little specific to traffic operations.

After-action debriefing of incident responses can provide valuable insights and improve future response coordination. Within the Albuquerque area, most agencies report some level of informal after-action discussions internally between law enforcement and traffic staff. These are typically limited to the largest and most significant events and usually occur on an ad-hoc basis during other coordination meetings and therefore may not be timely. In many agencies, documentation of the after-action discussion is not performed and therefore lessons learned may be lost to staff turnover. The known exception to documentation is NMDPS which formally documents after-action reviews and electronically stores them with required action items.

Aside from specific traffic incident debriefings, there are some annual events that have after-action discussions such as winter operations and the Balloon Fiesta but these focus more on the planning aspects rather than response.

RESPONDER TRAINING

The Statewide TIM training goal is 15% and progress thus far has reached 12%.

TIM training for first responders typically starts at the Academy with basic TIM training for law enforcement officers. The training used is SHRP2 National Traffic Incident Management Responder Training which highlights safe and quick clearance of incidents to minimize impact to traffic and limit exposure to responders. The same training is also available online through NHI for no costs for all professionals involved in incident response and towing/recovery. Outside the initial TIM training, training for most agencies is focused on law enforcement and investigations. Officers take Safer New Mexico Now training on traffic safety including traffic enforcement, DWI checkpoints, speed enforcement, and crash reconstruction. They may also take Advanced Roadside Impaired Driving Enforcement (ARIDE) for drug recognition expert (DRE) certification. NMDPS does require FEMA and OSHA refresher courses and provides additional internal training such as hazmat. First responders are trained to position their vehicles in a manner to prevent injury in case an errant vehicle enters the scene.

TIM training for support personnel within the transportation and public works sections are mostly focused on TMC operators and Courtesy Patrol. These staff are typically required to complete the introductory FEMA National Incident Management System (NIMS) courses that highlight the goals, scope, and methods of incident management and the role of the Incident Command System (ICS).

TIM training is typically not required of traffic engineers or traffic technicians. More traditional training and on-the-job training is provided to these staff and typically focus on traffic operations. For instance, traffic signal technicians are required to complete a comprehensive traffic signal program and many traffic staff are certified Traffic Control Technicians (TCT) and/or Traffic Control Supervisors (TCS).

While not formal training, on-the-job training is equally important. Several agencies do not have documented processes or procedures, such as Standard Operating Procedures, which can impact the continuity of institutional knowledge when staff turnover occurs.

For hazardous materials, there is an Emergency Response Guidebook that responders can carry within their vehicles as a hardcopy. There is also a cellphone-based app that provides the information electronically.

4.2.4 TIM AWARENESS, EDUCATION, AND OUTREACH

PUBLIC EDUCATION

Aside from some driving while intoxicated (DWI) campaigns, there are few if any public education campaigns or materials related to traffic incident awareness. Agencies do use their Facebook page or other communications platforms to distribute material but it is not a robust program.

UPPER MANAGEMENT ENGAGEMENT

Traffic incident response assessment in the Albuquerque area is limited. At the State level, the NMDOT tracks incident response metrics per Federal requirements but mostly related to the DOT response time only. Future improvements in the TMC platform will allow tracking of incident clearance time, all lanes open, and secondary crashes. At the local level, archived information from the computer-aided dispatch (CAD) could be evaluated but it isn't routinely done.

The primary source of data for incident details remains the crash reports collected by law enforcement. While agencies may request the data for safety assessments or insurance recovery purposes, there are few if any common performance metrics tied to crash or incident response data.

4.2.5 LEGISLATION

TIM LEGISLATION

The State of New Mexico has several laws related to traffic incident management – move over, authorized removal, and accident investigation unit. Each are described in detail below.

The “Move Over Law” (66-7-332) requires all vehicles approaching a stationary authorized emergency vehicle to move over, slow down, or be prepared to stop. The same law requires vehicles to yield right-of-way, move to the right, and/or stop if approached by a moving authorized emergency vehicle.

An “Authorized Removal Law” (66-7-350) allows police officers to move, or direct the driver to move, any vehicle that is obstructing traffic. Under 66-7-202, the driver of any vehicle involved in a damage-only crash shall move the vehicle to a position that does not obstruct traffic “more than is necessary”. If a vehicle is obstructing traffic, the Authorized Removal Law allows law enforcement to move it off the paved roadway or other place of safety. This law is currently being evaluated for changes that will provide agencies increased immunity related to vehicle damage. The potential for liability is preventing many agencies from using “push/pull/drag” operations.

Statute 66-7-507 provides the Department of Transportation Traffic Safety Bureau with authority to establish an “accident-investigation program” which would investigate crashes and crash causes. The investigation unit has the ability to gather data and receive assistance from any agency, department/division, political subdivision, or hospital to further their mission.

4.3 COMPARISON TO NATIONAL PRACTICES

Traffic incident management efforts in the Albuquerque Metropolitan Area may vary slightly across individual stakeholder agencies but, as a region, are fairly consistent. Each national effective practice was given a local implementation score – wide-scale implementation, partial implementation, or not in use – based on the interviews held and summarized in Chapter 3. Error! Reference source not found. illustrates the status of current AMPA TIM efforts relative to national TIM effective practices: wide-scale implementation (+), partial implementation (O), or not in use (X).

In general, there is a solid baseline relative to TIM response (field equipment, scene management, resources), traveler information, TIM education, and enabling legislation and the AMPA region stakeholders are utilizing 26 of the 51 national TIM practices. Of the 17 partially used practices and the 8 practices not in use, many are related to TIM planning, TIM training, education, and performance management.

Effective TIM Practices	Current Status in AMPA
Responder Communication and Coordination	
Incident Command System	+
Contact Lists	+
Response Matrix	○
Reference Location Signs	○
Responder Visibility and Scene Safety	
Emergency Vehicle Lighting	+
Incident Scene Illumination	+
Emergency Vehicle Markings	+
Crash Reconstruction and Investigation	
Total Stations	+
Photogrammetry	+
Unmanned Aerial Vehicles/Drones	○
Medical Examiner Coordination and Procedures	+
Quick Clearance and Removal Operations	
Towing and Recovery Contracts	+
Towing and Recovery Incentives	+
Vehicle-mounted Push Bumpers	+
Prepositioning of Emergency Equipment	x
Multi-Agency Coordination	
Joint TMC/EMC	○
Advanced Traffic Management System	○
Computer-Aided Dispatch (responders)	+
CAD Connection with TMC	x
Common Radio Frequencies	○
Data/Video Sharing	○
Event Detection and Reporting	
Closed-Circuit Television Cameras	+
Road Weather Information Systems	○
Traffic Detection	○

Legend: wide-scale implementation (+), partial implementation (○), or not in use (x)

Figure 12: TIM Practice Comparison (National vs AMPA)

Effective TIM Practices	Current Status in AMPA
Incident Response	
Safety Service Patrols	+
Motorcycle Patrols	+
Ramp Meters	X
Traffic Signal Connectivity	+
Emergency Vehicle Turn-around/Median Breaks	+
Traveler Information	
511 Traveler Information System	+
Portable Changeable Message Signs	+
Fixed Dynamic Message Signs	+
End-of-Queue Notification	X
TIM Planning	
TIM Strategic Plan	X
Alternate Route Plans	X
Table Top Exercises	O
After Action Review	O
Responder Training	
National TIM Training	O
TIM Responder Certifications	O
Train the Trainer	O
Response Vehicle Positioning	+
Hazardous Materials Identification	+
Towing and Recovery Vehicle ID Guide	O
Public Education	
Media Education Tools	X
Public-Private Partnerships	X
Upper Management Engagement	
Performance Management	O
Annual TIM Self-Assessment	O
Link Performance with Funding	X
TIM Legislation	
Authority Removal Laws	O
Driver Removal Laws	+
Abandoned Vehicle Laws	+
Slow Down/Move Over Laws	+

Legend: wide-scale implementation (+), partial implementation (O), or not in use (X)

Figure 12: TIM Practice Comparison (National vs AMPA) (cont'd)

5 TIM STAKEHOLDER WORKSHOP

5.1 WORKSHOP OVERVIEW

A virtual workshop was held with TIM stakeholders on August 5, 2020 to review the national effective TIM practices, summarize the stakeholder interviews, and gather additional information where gaps in knowledge existed relative to local TIM efforts. In addition to the above updates, an interactive polling activity was conducted with stakeholders to determine which TIM practices should be carried forward as priorities with the TIM Plan.

Input from the stakeholders helped develop a shortlist of TIM practices that were either (1) currently partially used or (2) currently not in use. These shortlists were used as the basis for the polling exercises to determine stakeholder priorities. Due to the online format, the polling took place within an online platform called Mentimeter (www.menti.com). Each stakeholder was allowed to independently score each practice from 1 (low) to 10 (high) to illustrate their relative importance for increased implementation.

5.2 TIM PRACTICE PRIORITIZATION

Each of the TIM practices were grouped according to their current status as provided in Section 4.3. Those practices that were considered “wide-scale implementation” within AMPA were excluded from further discussion. Those practices that were considered “partial implementation” or “not in use” were grouped for further discussion and prioritization. Each group was prioritized separately as described below.

5.2.1 PARTIAL IMPLEMENTATION

Those TIM practices that were identified as “partial implementation” were consolidated and presented to the stakeholders. These include the following, in no particular order:

- Response Matrix
- Joint TMC/EMC
- Common Radio Frequencies
- Road Weather Information Systems
- Table Top Exercises
- National TIM Training
- Train-the-Trainer
- Performance Management
- Authority Removal Laws
- Reference Location Signs
- Advanced Traffic Management System
- Data/Video Sharing
- Traffic Detection
- After Action Reviews
- TIM Responder Certifications
- Towing and Recovery Vehicle ID Guide
- Annual TIM Self-Assessment

Of the 17 above practices, the stakeholders reduced the list to 9 practices to include in the polling exercise as some of the practices already have efforts underway to expand their use and therefore do not need to be scored. Examples of these include the Regional TMC/EMC (already constructed), response matrices (developing as part of this project), and road weather information systems (limited stakeholder use but adequate roadway coverage).

The stakeholders subsequently participated in an online polling of the remaining 9 practices to provide a score (1-10) indicating their preference on expansion of the practice. This score is not a ranking but an independent assessment of importance to the stakeholder agency. The resulting aggregate scoring was used to categorize the practices into high, medium, and low priority levels. **Figure 13** shows the results for the “partial implementation” TIM practices – there were no low priority scores.

High Priority
Authority Removal Laws
After Action Reviews
Annual TIM Self-Assessment
National TIM Training
Train-the-Trainer
Medium Priority
Data/Video Sharing
Common Radio Frequencies
Performance Management
Traffic Detection

Figure 13: Priority Scoring for Partial Implementation TIM Practices

5.2.2 PRACTICES NOT IN USE

The TIM practices that were identified as “not in use” were consolidated and presented to the stakeholders. These include the following, in no particular order:

- Prepositioning of Emergency Equipment
- End-of-Queue Notification
- Alternate Route Plans
- Public-Private Partnerships
- Ramp Meters
- TIM Strategic Plan
- Media Education Tools
- Link Performance with Funding

Of the 8 above practices, the stakeholders reduced the list to 4 practices to include in the polling exercise as some of the practices already have efforts underway to expand their use and therefore do not need to be scored. Examples of these include the TIM Strategic Plan and alternate route plans, both of which are being developed as part of this project.

The stakeholders subsequently participated in an online polling of the remaining 4 practices to provide a score (1-10) indicating their preference on initiating the practice. This score is not a ranking but an independent assessment of importance to the stakeholder agency. The resulting aggregate scoring was used to categorize the practices into high (7.1-10.0), medium (4.1-7.0), and low (1.0-4.0) priority levels. **Figure 14** shows the results for the “not in use” TIM practices – there were no low priority scores.

High Priority
Media Education Tools
End-of-Queue Notification
Medium Priority
Ramp Meters
Pre-positioned Emergency Equipment

Figure 14: Priority Scoring for Not in Use TIM Practices

6 TIM RECOMMENDATIONS

6.1 AUTHORITY REMOVAL LAW

New Mexico currently has an “Authorized Removal Law” (66-7-350, *Officers authorized to remove illegally stopped vehicles*) that allows police officers to move, or direct the driver to move, any vehicle that is obstructing traffic. If a vehicle is unnecessarily obstructing traffic and can be moved, the Authorized Removal Law allows law enforcement to move it off the paved roadway or to another place of safety. This law also includes a clause that allows law enforcement to tow any vehicle left unattended on the roadway shoulder if it is causing an obstruction or left for more than 24-hours without notification.

In terms of authority removal of vehicles involved in incidents, the potential for liability against an agency is preventing its use in circumstances where “push/pull/drag” operations may cause additional damage to a vehicle. Some agencies report an internal blanket restriction from any push/pull/drag operations while others have instituted a requirement for obtaining approval from management prior to moving vehicles.

In terms of towing abandoned vehicles, New Mexico had a 2002 court decision (Court of Appeals of New Mexico, *Sandia v. Rivera*, 2002-NMCA-057, 132 N.M. 201, 46 P.3d 108) that deemed the law unconstitutional in that it does not provide adequate due process to the vehicle owner prior to removal via a contracted towing company. The decision states that “the statute is fatally flawed in failing to provide due process to an owner of a vehicle towed at the direction of the government” and that the “government must provide notice of an owner's right to a meaningful and timely hearing to challenge the towing.” However, nothing in the decision is “intended to restrict law enforcement officers from continuing to remove vehicles that obstruct traffic or that, based on safety concerns, must be removed to protect the traveling public from harm.”

6.1.1 IMPLEMENTATION NEEDS

To increase the ability of agencies to utilize New Mexico Statute 66-7-350, there are two key modifications that are needed – limited liability to agencies for property damage, and a towing notification due process. While neither of these require direct resources from the TIM stakeholders, they do require education of legislators and executive leadership and specific action within the State Legislature to modify the law.

LIMITED LIABILITY

The *Incident Responders' Safety Model Law* provides model language for authority removal in which public agencies are authorized to move obstructing vehicles from the roadway. The existing New Mexico Statute is generally consistent in purpose and content though there are some beneficial clauses that could expand the use of 66-7-350. These include:

Limited Liability: Many states pair the authority removal law(s) with language to limited liability toward agencies who remove vehicles as part of an incident response. The recommended “hold harmless” language states that vehicle clearance activities “exercised with reasonable care and at the direction of the incident commander, those governmental agencies and their personnel and other designated representatives are insulated from liability resulting from such actions taken pursuant to incident clearance.”

Expanded Authority: While the New Mexico law specifies that the removal of the vehicle shall be by law enforcement (police, sheriff), other states expand the authority to state department of transportations (DOT). The expansion allows removal by DOT maintenance vehicles, courtesy patrols, or other resources which may increase the ability to remove vehicles quicker and relieve law enforcement to conduct police-related tasks.

ABANDONED VEHICLE TOWING

The current New Mexico law authorizes the removal of abandoned vehicles if there is a safety concern to mainline traffic. This clause is consistent with recommended authority removal practices though the FHWA Quick Clearance Best Practices cautions that the authority may be met with public resistance. Some have argued to prohibit towing of abandoned vehicles and to only allow agencies authority to tow attended vehicles despite similar safety concerns. The following recommendations are provided to assist in keeping the abandoned vehicle towing capability:

Cost Reimbursement: Many states include language that allows a public agency to recover, or transfer, the cost of removal, transport, and storage of vehicle(s) and cargo to the registered owner. The recommended model language states “any agency, person or organization incurring the cost of removing vehicles and/or cargo at an incident, if such removal is authorized by the traffic incident commander, shall have the unqualified right to compensation for the cost of such removal from the owner (or owners) of the vehicles removed and/or the vehicles whose cargo was removed in whole or in part.”

Engage Towing Industry: The private towing companies are major stakeholders in this practice and are responsible for the transport and storage of vehicles. Towing companies are often the interface with the public and assess the fees. As such, engaging towing companies and developing procedures or guidance may help relations with the general public.

Notification: Many states have developed notification practices that require standardized State forms to be sent to the vehicle owner from the Department of Transportation within a certain timeframe after being towed. This notification, or any due process, cannot be completed prior to towing if the vehicle is abandoned and creating a safety concern. For effective traffic management, the vehicle must be towed to remove the hazard and then notification provided. The forms typically include vehicle identification, date/time of removal, reason for removal, towing/storage facility and contact information, and officer approval. Agencies can also establish a process to hear arguments surrounding the validity of the vehicle removal afterward. An example is included in Arizona 28-872: agencies shall provide vehicle owners “*the opportunity for a poststorage hearing to determine the validity of the removal. This hearing shall be conducted within forty-eight hours after a request, excluding weekends and holidays....The public agency employing the officer who removes or causes the removal of the vehicle is responsible for the costs incurred for towing and storage if it is determined at the hearing that probable cause for the removal cannot be established.*”

6.2 AFTER-ACTION REVIEWS

Lessons learned from after-action reviews are important and can provide valuable insights and improve future response coordination. The AMPA stakeholder agencies do perform some limited after-action reviews though the agencies vary considerably in terms of implementation. There is formal multi-jurisdictional participation in the planning of recurring major events such as the Balloon Fiesta and other regional efforts but evaluation of incident response to unplanned events is significantly less – some agencies conduct coordinated reviews after large incidents while other agencies rarely meet regardless of event.

In nearly all agencies, the guidelines and procedures for after-action reviews are informal and inconsistent. Internal discussions occur between law enforcement and traffic staff when deemed appropriate but these are typically limited to the largest and most significant events and usually occur ad-hoc during other coordination meetings.

6.2.1 IMPLEMENTATION NEEDS

After-action reviews do not require extensive time or cost, only staff time for meetings and follow-through. To increase the utility of after-action reviews, the reviews should be formal, timely, and well documented. The following steps are recommended for AMPA stakeholder agencies:

DEVELOP CRITERIA

After-action reviews should be initiated based on defined criteria so that agencies and TIM stakeholders know when there is value in assembling staff for a review. By establishing specific criteria, after-action reviews would no longer be ad-hoc and informal but would be an established part of the overall TIM effort. Criteria, while not standard, should be based on metrics that are easily tracked and understood by the operating agencies. These metrics may include roadway clearance times, incident clearance times, number of vehicles involved, number of fatalities, or less numeric metrics such as significant media coverage/public complaints, large recurring planned events, or risk assessments.

The criteria established for conducting an after-action review should result in a limited but meaningful number of reviews. Criteria that are too lenient will result in too many reviews while one that is too restrictive may not result in enough reviews – both of which may lead to general disregard for the value of the meeting.

In addition to establishing criteria for which events warrant a review, agencies should establish criteria for when the review occurs. The quicker a review occurs after an incident, the more familiar participants will be with the actions and the less information will be lost. In some agencies, the after-action reviews are standalone and focused meetings that occur within a defined time period after an event occurs that meets the criteria. In others, there are recurring meetings setup on a regular schedule that will allow discussion of after-action reviews as part of other agenda items.

FORMALIZE PROCESS

After-action reviews must cover a wide range of topics with input and participation from a number of stakeholders and agencies. To ensure completeness and consistency, the meeting objectives, formats, and agenda should be formalized to allow a standardized process. By creating a formal process, the stakeholders can develop a familiarity with the reviews and expect similar results regardless of who conducts the meeting.

Forms or checklists can ensure the review includes all applicable TIM elements from initial response to restoring traffic flow. The standardization can increase involvement by stakeholders by ensuring that each function is required to participate and provide information/feedback.

Important to these reviews is the establishment of an open forum. After-action reviews are a critique of the event centered on constructive evaluation and not an assignment of blame. At the onset, participants should be reminded that the meeting's intent is not a personnel review or disciplinary action but a method to which all stakeholders can evaluate events and apply lessons learned for future scenarios. Part of establishing an open forum that invites discussion is an appropriate moderator. The moderator should not be an executive or high-level manager that may be perceived as intimidating but rather a neutral, 3rd-party facilitator that understands traffic incident management. Ideally the moderator would be someone not directly involved in the incident under review so that more background questions and discussions are required to develop an understanding of the event.

SHARE KNOWLEDGE

After-action reviews are not only valuable to those that attend but all agency staff. In order to share the meeting outcomes, the moderator (or other participant) should develop meeting notes or other formal documentation. This can be accomplished using a standard form which may reduce workload on staff and simplify the administration. Standard forms, particularly electronic versions, can be catalogued for future reference and provide easier tracking of progress. The form should include the ability to highlight positives or strengths of the TIM review as well as areas of concern, lessons learned, and follow up action items.

The documentation should be distributed to the partner agencies with actionable items assigned to specific stakeholders. These items may be minor changes to existing processes that can be implemented immediately or may require new processes to be developed requiring a long-term commitment. The moderator (or other participant) should be responsible for conducting follow-up with stakeholders to ensure action items are advancing.

6.3 ANNUAL TIM SELF-ASSESSMENT

Traffic incident response self-assessments in the Albuquerque area are limited. As part of the FHWA TIM Self-Assessment program, geographic areas can participate in an annual TIM assessment that allows agencies to identify strengths and weaknesses in their TIM programs. The assessment includes questions related to strategic, tactical, and support elements and is compared to the baseline 2003/2004 and prior year assessments. The information also allows a consistent process to foster national evaluation of TIM progress and agency needs.

The State of New Mexico has participated in the annual FHWA TIM Self-Assessment with participation from both transportation and law enforcement stakeholders. The scoring from the most recent 2019 assessment is provided in **Figure 15**. Unweighted scores refer to the raw scores related to the 55 questions while the weighted scores consider the guideline’s weighting of 40% strategic, 40% tactical, and 20% support elements.

Section	# of Questions	Unweighted Score		Weighted Score	
		New Mexico	US Average	New Mexico	US Average
Strategic	28	58.9	68.5	23.6	27.4
Tactical	22	71.6	77.5	28.6	31.0
Support	5	55.0	74.0	11.0	14.8
Overall	55			63.2	73.2

Figure 15: New Mexico FHWA TIM Self Assessment (2019)

6.3.1 IMPLEMENTATION NEEDS

While the FHWA self-assessment at the Statewide level includes many of the stakeholders and activity within AMPA, it is recommended that Albuquerque stakeholders initiate the same self assessment for the AMPA region. By focusing on the AMPA region, the self-assessment will provide a better baseline metric to allow stakeholders to measure progress from the TIM initiatives and priorities identified as part of this study.

Implementation needs for an AMPA self-assessment are few. The same FHWA questionnaire can be used with little modification and stakeholders are likely already familiar with the questions. As the assessment would be local, MRCOG can serve as the lead in facilitating the scoring and potentially utilize the MRCOG ITS Subcommittee and/or Congestion Management Subcommittee structure as the basis for convening the appropriate stakeholders.

6.4 NATIONAL TIM TRAINING

The New Mexico Statewide TIM training goal is 15% and progress thus far has reached 12%. Specifics to the AMPA area were not available but TIM training depends on the individual agencies and staff roles. TIM training for first responders typically starts at the Academy with basic TIM training for law enforcement officers. TIM training for support personnel within the transportation and public works sections are mostly focused on TMC operators and Courtesy Patrol. These staff are typically required to complete the introductory FEMA National Incident Management System (NIMS) courses that highlight the goals, scope, and methods of incident management and the role of the Incident Command System (ICS). Within AMPA, formal TIM training has been established for TMC Operators and Courtesy Patrol staff. However, TIM training is typically not a requirement of traffic engineers or traffic technicians.

While not formal or classroom training, on-the-job TIM training and documented processes or procedures, such as Standard Operating Procedures, are equally important to assist with continuity of institutional knowledge during staff turnover.

6.4.1 IMPLEMENTATION NEEDS

Increasing TIM training within the TIM stakeholder community can improve coordination and response safety. The availability of national training resources can limit the burden on agencies and private companies by eliminating the need to develop internal material and national web-based courses make it convenient for individual learning. Agencies may increase training completion by making it a requirement of the position, if not already. Common training across stakeholder functions helps increase consistency and cross-discipline understanding.

NATIONAL RESOURCES

National TIM training resources are available from a variety of sources including:

- Federal Highway Administration, Office of Operations (https://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm)
- Federal Highway Administration, National Highway Institute (<https://www.nhi.fhwa.dot.gov/>)
- Federal Emergency Management Agency (<https://www.fema.gov/>)
- AASHTO, National Traffic Incident Management Coalition (<http://ntimc.transportation.org/Pages/default.aspx>)
- Consortium for ITS Training and Education (<https://www.citeconsortium.org/>)
- Emergency Responder Safety Institute (<https://www.respondersafety.com/>)
- The Eastern Transportation Coalition (<https://tetcoalition.org/>)
- Towing Recovery Association of America (www.traaonline.com)
- American Traffic Safety Services Association (www.atssa.com)

Many of the above sites have multiple training options and provide links to additional resources that may be regionally or locally developed or on the fringe of traffic incident management. While some of the foundational training courses are free, others may require a fee.

TRAINING REQUIREMENTS

To ensure adequate training completion, agencies may establish requirements for their staff based on role and/or position. Training requirements can be linked to promotions or other personnel actions that reward completion or provide other incentives. Internal certifications, while less formal, can also help incentivize a certain level of TIM training. These requirements would have to be developed within each agency through the Human Resource department.

MULTIDISCIPLINARY INTERACTION

While TIM training is beneficial to the individual and increases their ability to respond safely and contribute to the overall TIM effort, joint training adds another level of cooperative preparedness. Exercises involving multiple stakeholders or functions allows individuals to interact in a controlled environment without the pressure of an active response. Table top exercises, where participants “role play” a potential incident scenario, provides an opportunity to observe and learn how partners respond to situations and then apply those lessons to future real world events.

Planning and executing table top exercises is typically done by State DOT or regional MPO agencies though any agency can take the lead if qualified staff are available.

6.5 TRAIN-THE-TRAINER

The Albuquerque area has two TIM Trainers though one is in a leadership position and has limited availability. TIM Trainers are certified by FHWA after completing specialized instructor training. Once certified, they are able to train other personnel in their home location resulting in more frequent training opportunities than otherwise available through national trainers.

6.5.1 IMPLEMENTATION NEEDS

Increasing the number and availability of TIM Trainers in the AMPA area generally only requires volunteer stakeholders. The associated training is provided/sponsored by FHWA and does not necessitate a large investment by the local agencies. Staff interested in completing the TIM Train-the-Trainer courses must have prior TIM training as well as instructor experience and must be willing to commit time to certify themselves and to instruct others through group settings. There are few additional needs from the agencies to support initiation of more TIM Trainers.

6.6 DATA/VIDEO SHARING

In AMPA, camera video feeds and traffic conditions (congestion) are generally available from NMDOT via the NMRoads website. The camera feeds are obtained using NMDOT-owned cameras and the traffic conditions are purchased from a 3rd party data provider. This platform and data are managed by NMDOT and available to the general public including use by local stakeholders. Local stakeholders can coordinate with NMDOT for administrative accounts that allow enhanced video feeds such as streaming-level refresh rates and multiple camera views. Aside from NMDOT, video and data feeds from AMPA stakeholders are generally not shared outside the respective agencies. Video streams from NMDOT cameras are not recorded or saved.

Outside web-based platforms, direct data sharing between agencies is relatively limited. Virtual private network (VPN) connections have been attempted between agencies but have proven difficult due to network security concerns. While stakeholders are receptive of sharing additional information, there has not been significant data sharing efforts and there are no current plans for direct network access between agencies.

Historical data, while not applicable to an active TIM response, can help in planning efforts. MRCOG conducts a Traffic Monitoring and Counts Program that includes data collection along all major roadways classified as collector and above. MRCOG shares this data through their website using static and interactive maps, reports, and a querying tool. No further implementation steps are recommended for this form of data.

6.6.1 IMPLEMENTATION NEEDS

Data and video sharing among stakeholders can improve response planning and situational awareness. The two major data categories are traffic data and video images. Currently, agencies do share this information but only in a limited format.

TRAFFIC DATA

Traffic data collected by roadway sensors can be shared in real-time. Currently, NMRoads relies on a 3rd party data provider for displaying traffic congestion – shown as “heavy”, “moderate”, “light”, and “free flow” on NMRoads displays. Supplementing this data with roadway sensor data can provide agencies with specific

information by lane. Depending on the type and/or location of sensors, data sharing can also provide information on queue lengths, volumes, and other information that could help support operational decisions.

VIDEO DATA

Roadside video cameras can provide real-time visual awareness of field conditions. This input is invaluable to first responders as it gives early indication to incident location, critical issues, traffic impacts, and available access to the scene. The video available on NMRoads website is live but is limited to a static image refreshed once per minute and not a streaming feed. To improve information, AMPA stakeholders should obtain administrative accounts to improve video access. Similarly, NMDOT should evaluate options to allow the NMRoads video feed to be automatically updated every 2-3 seconds providing better frame refresh rates.

City of Albuquerque staff have indicated their desire to develop a web-based platform to share traffic and camera data similar to NMRoads. The platform could support the City and adjacent stakeholder agencies. While the effort is in the early stages, it is an important step in sharing data as current field infrastructure is connected to a City IT server that does not allow external access.

SHARED CONTROL

Co-location at the Regional TMC will help in coordinating and providing access to information. However, there are no current plans to connect systems or data networks and synergies will be developed based solely on proximity and staff coordination. Control of the cameras will remain with the infrastructure owner but secondary control, through an IGA, could be given to the Regional TMC or other center for use when owning agency staff are not available.

6.7 COMMON RADIO FREQUENCIES

Communication between law enforcement agencies (State, County, local) in Albuquerque is somewhat difficult as each use different radio frequencies. Currently, all fire departments are on a separate radio system from law enforcement but they can be reached through the regional dispatch center. Communication during incidents is typically managed through dispatch (radio and CAD) for initial response and official follow-up; however, officers try to keep radio traffic to a minimum and use cell phones for most tactical coordination on scene.

While the region currently lacks an interoperable radio system, the relative size of the region is such that everybody knows who to contact and most rely on personal relationships to coordinate and circumvent radio issues. This method is effective until staff turnover and/or law enforcement rotations change staffing assignments thereby creating a potential issue during a critical incident.

6.7.1 IMPLEMENTATION NEEDS

An interoperable radio system helps manage resources during incident response and allows timely notification and coordination across many agencies and functions. This becomes more difficult with large or complex incidents requiring many response agencies, after-hour incidents, unavailability of primary contact, multiple incidents, or staff turnover. Currently, there is already a project being developed that will provide an interoperable radio network through FirstNet. The project, funded through a grant, will upgrade the communication towers and radios to allow a common frequency. A specific schedule is not available but it is anticipated to be several years before the system is fully operational.

Prior to the FirstNet system being deployed and staff trained, a near-term improvement to benefit multi-agency communication should be the development of a contact list. Information for each individual should include function, response area, cell phone numbers, pager/radio contact, working hours, alternate/backup contact, and other pertinent data. Regular updates should be provided to keep the list relevant.

6.8 PERFORMANCE MEASURES

Performance measure development and tracking, relative to traffic incident management, is not an active part of the TIM efforts within AMPA. At the State level, the NMDOT tracks incident response metrics per Federal requirements but mostly related to the DOT response time only. At the local level, archived information from the computer-aided dispatch (CAD) could be evaluated but it isn't routinely done.

In general, a lack of data related to TIM is a primary barrier to developing more robust performance measures that can provide insight to TIM improvements.

6.8.1 IMPLEMENTATION NEEDS

The development and tracking of performance measures is a key step in evaluating TIM effectiveness. Granular data can provide insight to the various steps within the overall TIM effort and provide feedback to specific stakeholders. The key steps to implementing TIM performance measures is the identification of metrics, establishing data sources, and regular reporting.

IDENTIFY METRICS

TIM response consists of numerous steps and functions that all contribute to the efficient and safe handling of events. A single performance measure, such as incident clearance time, may not provide adequate information to evaluate the various steps or functions. Breaking the TIM timeline down to smaller measures or identifying other performance measures specific to a stakeholder group or function can give unique insight to specific issues. The region, as part of annual TIM coordination, should establish measures that can be consistent across AMPA. In addition, targets or goals should be established to guide improvement efforts.

ESTABLISH DATA SOURCES

As part of the performance measures identified above, associated data requirements will need to be identified. Data can be collected or provided from a number of methods or sources and each agency should determine the approach that is most appropriate based on resources available. For traffic performance, examples of data sources include: agency-owned traffic detectors (loops, video, etc), Bluetooth/WiFi readers, third-party data providers, or potential connected vehicle data. For responder performance, existing data can be sourced from the Traffic and Criminal Software (TraCS) forms or new field/forms can be developed to reflect various timepoints in the TIM event.

The data should reflect individual TIM steps or ownership so that future evaluations can establish clear lines of ownership (if possible). Data collection should be automated to the extent possible and be integrated into regular TIM documentation. Archiving of the data is also important for establishing long-term trends.

REGULAR REPORTING

The performance measure process requires active evaluation in order to provide an assessment of TIM response. Regular reporting on TIM performance measures can show historical trends and identify specific issues within a phase or portion of the TIM timeline. Individually, agencies should utilize available TIM data to create performance measure reports including both the current values as well as any trends. Quarterly meetings should be established where stakeholders collectively review the measures and discuss any action items required to improve local TIM efforts.

6.9 TRAFFIC DETECTION

Traffic data collected along existing roadways are managed by the respective agencies. NMDOT has a network of permanent roadway detection sensors along the interstates that collect traffic volumes, occupancy, and vehicle

speeds. NMDOT combines their permanent roadway detection data with other data sources – manual counts, temporary counts, and weigh-in-motion – to provide planning products through their Data Management Bureau.

In addition, MRCOG implements an annual traffic count program with all AMPA agencies, collecting a small traffic volume sample (48-hour duration) along all major roadway segments. This program, aimed at planning-level decisions, is not beneficial to real-time decision-making relative to TIM but does provide representative typical volumes. In addition, MRCOG and the City of Albuquerque have installed various Bluetooth/WiFi sensors along key corridors to collect travel data (speed, routing) from available cellphone and other mobile devices. These data can support TIM planning in terms of detour needs, queuing impacts, and possible priority needs.

6.9.1 IMPLEMENTATION NEEDS

Abnormal traffic congestion is a key indicator of an unplanned event such as a traffic incident. Slow traffic speeds can signal abnormal traffic operations and identify the need for further visual confirmation. Similarly, high roadway occupancy data at a particular sensor location can indicate queuing within a particular lane. Agencies should evaluate their roadway network for locations that are regularly susceptible to incidents or are severely impacted when incidents occur, and install appropriate traffic detection sensors for monitoring operations in real-time. Sensors can include cameras, loop detectors, or non-intrusive systems such as Bluetooth/WiFi devices.

Automatic notifications of potential incidents can help alert operators in a TMC to visually review locations experiencing abnormal traffic operations. Software algorithms can compare real-time traffic speed and roadway occupancy data to historical averages to determine when or where incidents may have occurred. This process can be more accurate than 3rd party information where data is averaged over all lanes and long roadway segments. There are several private companies that have developed services that identify locations of high crash potential based on field data and conditions. These have been piloted and implemented in several states though research is continuing.

6.10 MEDIA EDUCATION TOOLS

Media-based education and outreach developed within AMPA agencies are few aside from the specific topic of driving while intoxicated (DWI). There are no specific public education campaigns or materials related to traffic incident awareness. Agencies do use their Facebook page or other communications platforms to distribute material but these are not robust programs.

6.10.1 IMPLEMENTATION NEEDS

Traditional media and social media are effective mechanisms to reach wide audiences. These platforms offer opportunities for general driver education on TIM laws, such as Move Over and Authorized Removal, general traffic safety during incidents, and responder safety. Agencies can develop their own public service announcements (PSAs) using internal resources or share resources and create regional PSAs that can be distributed throughout AMPA. Regional efforts would likely be developed and distributed by MRCOG and/or NMDOT. While some educational topics must be specific to Albuquerque (or at least New Mexico), other topics may be suitable to use generic material. There are national PSAs and other material that have been developed and available for agency use. FHWA has developed a TIM Outreach Toolkit and websites like ResponderSafety.com, Trafficsafetymarketing.gov, or Moveoveramerica.com provide material for download. These resources can be posted to agency websites, agency social media platforms, or distributed to local television and radio stations for advertisement. Printed material is also feasible though tends to be more costly per person reached.

During incidents, media can serve as outlets for specific information relative to location, conditions, duration, and potential detours. To standardize delivery of incident information, the AMPA stakeholders can develop a standard form for media information packets. This can also apply to information dissemination through agency social media platforms as standardized information and formatting can improve public acceptance/adoption.

6.11 END-OF-QUEUE NOTIFICATION

End-of-queue notification during incidents is provided for approaching traffic through the use of fixed overhead or shoulder mount DMS where available. In locations where there are no DMS, warning is provided via truck-mounted arrow boards or response vehicles with emergency lights. Currently NMDOT utilizes overhead DMS to provide messages to approaching vehicles during incidents. A video analytics tool is in place that assists TMC operators in identifying queuing and slowdowns. The video analytics tool utilizes available CCTV images to detect potential changes in speed and sends email alerts to the operators. Operators then follow standard procedures to post DMS messages and coordinate any applicable response. Local agencies do not have formal end-of-queue processes.

6.11.1 IMPLEMENTATION NEEDS

While NMDOT does have a video analytics tool to help identify potential queuing, there are additional steps that can increase the use of end-of-queue notification. Utilizing traffic detection devices in addition to CCTV images can increase the available coverage of queue detection. In addition, transportation agencies can work with law enforcement to develop standard response procedures for queuing in locations without permanent DMS. Procedures such as utilizing enforcement vehicles with emergency warning lights can provide a quicker warning to drivers and provide more flexibility in terms of location.

6.12 RAMP METERS

Ramp metering has not been implemented in AMPA. Currently there is a study underway to evaluate ramp metering along I-40 as part of a congestion management effort. This report will review existing ramp configurations, existing traffic volume criteria, and recommend implementation locations. The outcome of this study will determine the future implementation needs.

6.12.1 IMPLEMENTATION NEEDS

The ramp metering study currently underway is part of the strategy implementation. Additional implementation steps will depend on the recommendations from the study but, in general, the major steps for implementing ramp metering are provided below. If ramp meters are not recommended as part of the current study, the evaluation should be repeated every 2-3 years as traffic growth continues in the AMPA region.

SYSTEMS ENGINEERING

Ramp meters are new to AMPA and will require a coordinated approach with all stakeholders involved. The system will require a Systems Engineering process, including Concept of Operations and Systems Requirements, to define the configuration and operation of the system, including how the system would operate during incidents. This process will also determine how the ramp meters will be controlled, monitored, and maintained along with any TMC upgrades. This process is a federal requirement for ITS devices and required to utilize federal funds for construction.

INFRASTRUCTURE IMPROVEMENTS

Ramp meter operations will stop vehicles on the on-ramps to the interstates. Special consideration will be needed to determine if the existing ramps provide adequate acceleration distance for vehicles to safely merge with interstate traffic and adequate storage length to store the ramp meter queuing.

Project delivery will also require design plans detailing the ramp meter installation and any required infrastructure improvements, such as ramp modifications for acceleration and/or queue storage.

6.13 PRE-POSITIONED EMERGENCY EQUIPMENT

Pre-positioned emergency equipment can consist of a wide range of options – vehicles, equipment, towing resources, and staff – depending on the application and need. AMPA stakeholders do not currently pre-position emergency equipment regularly. Some agencies maintain a mobile trailer stocked with necessary traffic control supplies though the trailer is largely stored at a central facility and not at a specific location of need. Known weather events, particularly snow, are the only known occasions when equipment (snow plows) may be activated and deployed beforehand.

6.13.1 IMPLEMENTATION NEEDS

Pre-positioning emergency equipment can be beneficial if there is a known location or event that is prone to requiring TIM response and/or is difficult to reach in a timely manner. To determine potential applications, agencies should review historic data to identify incident patterns in terms of location and time. Using this data, a planning-level meeting should be conducted with first responders and other stakeholders to discuss past difficulties and potential benefits for pre-positioning. As pre-positioning requires additional resources and planning, it should not be deployed until other practices have been evaluated and implemented.

7 TIM IMPLEMENTATION

Implementation of the TIM Plan will require resources, both in terms of people and funds, in order to progress and/or initiate the prioritized practices. While each practice has specific implementation steps identified in the prior chapter, the timing of adoption will depend on available resources within each stakeholder agency and may not occur at the same time. To improve coordination between agencies, it is recommended that common TIM response templates be adopted through the Regional TMC. These templates will establish a formal TIM process or checklist that will ensure a consistent approach to managing incidents and ensure that TIM practices are utilized as they become available. A recommended timeframe for implementation is provided in this chapter based on priority and level of effort required for adoption. While these timeframes serve as a baseline reference for planning and programming, the timing may change based on agency resources and other factors.

7.1 TIM RESPONSE TEMPLATES

Traffic incident management requires the execution of many diverse strategies to detect and respond to incidents, safely manage the scene, accommodate active traffic, and communicate with the public. While many of these strategies are specific to particular TIM stakeholders, the Regional TMC serves as a central coordination point in many steps and certainly in the data collection and dissemination of public information. To ensure that TMC operators engage all major TIM stakeholders and trigger the appropriate strategies, response templates have been developed to provide a checklist based on the type of incident.

In order to provide flexibility while also limiting the complexity of the response templates, the templates are built around a matrix of incident “levels”. Each level represents an order of magnitude relative to traffic impacts with “Level 1” being low impact to “Level 4” being severe impact. TMC operators should use available information to select the appropriate level of incident early in the response timeline. **Figure 16** shows these levels based on the incident location (facility type), time-of-day, and number of lanes blocked. For instance, an incident on a major arterial crossing the Rio Grande would be considered a Level 1 if it blocked one lane and occurred at 10:00 PM. However, a similar incident in the same location would be considered a Level 3 if it blocked one lane during the peak commute hours.

As incidents progress, it may be necessary for TMC operators to move from one level response template to another in order to adjust to the observed conditions. For instance, an interstate incident that blocks two lanes at 5:00 AM may be a Level 2 initially but will necessitate a Level 4 response if it remains with two lanes blocked into the peak period (6:00 AM). Similarly, a higher level incident may be reduced if incident responders are able to open lanes (reduce impact) and/or the incident duration extends into off peak hours. In all instances, FHWA will be advised if a full interstate closure is 8 hours or longer.

Interstate 25 Interstate 40	Off-Peak Hours (8 PM – 6 AM)	Typical Daytime (9 AM – 4 PM)	Peak-Periods (6 AM – 9 AM, 4 PM – 8 PM) Special Event
Shoulder Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
1 Lane Blocked	Level 1 (Low)	Level 2 (Medium)	Level 3 (High)
2+ Lanes Blocked	Level 2 (Medium)	Level 3 (High)	Level 4 (Severe)
Full Closure	Level 3 (High)	Level 4 (Severe)	Level 4 (Severe)
Major Arterials (State Highways or Local Agency River Crossings)	Off-Peak Hours (8 PM – 6 AM)	Typical Daytime (9 AM – 4 PM)	Peak-Periods (6 AM – 9 AM, 4 PM – 8 PM) Special Event
Shoulder Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
1 Lane Blocked	Level 1 (Low)	Level 2 (Medium)	Level 3 (High)
2+ Lanes Blocked	Level 2 (Medium)	Level 3 (High)	Level 4 (Severe)
Full Closure	Level 2 (Medium)	Level 4 (Severe)	Level 4 (Severe)
Major Arterials (Local Agency)	Off-Peak Hours (8 PM – 6 AM)	Typical Daytime (9 AM – 4 PM)	Peak-Periods (6 AM – 9 AM, 4 PM – 8 PM) Special Event
Shoulder Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
1 Lane Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
2+ Lanes Blocked	Level 1 (Low)	Level 2 (Medium)	Level 3 (High)
Full Closure	Level 2 (Medium)	Level 3 (High)	Level 4 (Severe)

Figure 16: Response Template Reference Matrix

It should be noted that these Response Templates are intended for use on incidents that both impact traffic operations and require a multi-faceted response. These Response Templates are not necessary for abandoned vehicles on the right-hand shoulder, debris blocking a shoulder, or other minor occurrences.

In addition, the Response Templates provide a checklist and general guidance to ensure that all major functions are considered. The functions listed in a template do not represent a timeline or linear process – some items may be skipped or performed in a different order depending on the situation and incident response.

Full response template details are provided in the Appendix but generally cover the following topics:

- Law Enforcement
- EMS/Fire
- Courtesy Patrol
- HAZMAT
- Traffic Operations (Roadway Owner)
- Traffic Operations (Other)
- Temporary Traffic Control
- Traveler Information (DMS, 511, NMRoads, Media)
- Transit Providers
- Towing (including Heavy Vehicle)
- Office of Medical Investigator
- Incident Resolution
- Performance Metrics
- After-Action Debrief

In addition, there is a list of critical areas and items that should be continuously monitored throughout the incident duration. If any of these critical areas/items meet set criteria in the table, additional steps/tasks are required to help mitigate the corresponding impact. These critical areas/items include:

- Interstate Mainline Queuing
- Off-ramp Queuing
- On-ramp Queuing
- Arterial Traffic Signal Operations
- Arterial Unsignalized Operations
- At-grade Railroad Crossings

For contact information, the NMDOT District 3 Traffic maintains a current contact list for the regional AMPA stakeholders involved in traffic incident management. The list provides key points of contact for each agency/service provider and phone numbers.

7.2 ALTERNATE ROUTE PLANS

The active implementation of alternate route plans is a TIM practice that is not currently utilized in the AMPA region. As a matter of practice, AMPA agencies do not designate specific routes for travelers to use during closures but rather, if DMS are available, post overhead messages indicating that alternate routes should be used. Drivers independently find diversion routes that are suitable for their original destination based on local knowledge or GIS-based navigation apps.

In an effort to identify roadways that may be adversely impacted during extended closures, maps were created illustrating potential diversion routes that drivers may choose to take during key closures. These maps are provided in the Appendix and relate to major closures along I-25, I-40, and across the Rio Grande. Each map illustrates logical diversion routes based on the roadway network, roadway classifications, and travel patterns. Reference is also made to a draft AMPA “TIM Network” that was previously developed by AMPA member agencies. These routes are not anticipated to be advertised to the traveling public but are provided for operating agencies to evaluate in anticipation of a potential closure.

TIM efforts along these routes can include, but not limited to, developing traffic signal timing plans that can accommodate the increased demand associated with the diversion traffic. Coordination of the TIM response and

traffic signal modification can be handled through the Regional TMC operations and the associated steps identified in the TIM Response Templates. As deployments occur, these diversion route maps can be updated through feedback from the after-action debriefs.

7.3 IMPLEMENTATION TIMEFRAMES

The TIM practices identified for prioritization will be implemented over time as not all agencies can address all practices simultaneously. While each stakeholder agency may implement practices on different timeframes based on levels of existing effort, available resources, or political influences, the AMPA region should establish a framework outlining the general phasing.

Implementation of practices can be categorized into general timeframes – Near-term (2021-2022), Mid-term (2023-2025), and Long-term (2026 and beyond). Based on these timeframes, the recommended implementation of practices is illustrated in **Figure 17**.

	Near Term		Mid Term			Long Term	
	2021	2022	2023	2024	2025	2026	Beyond
Partially Used Practices							
High Priority							
Authority Removal Laws	■						
After Action Reviews	■						
Annual TIM Self-Assessment	■						
National TIM Training	■		■				
Train-the-Trainer	■		■			■	
Medium Priority							
Data/Video Sharing	■		■				
Common Radio Frequencies	■						
Performance Management	■		■				
Traffic Detection	■		■			■	
Not Used Practices							
High Priority							
Media Education Tools	■						
End-of-Queue Notification	■		■				
Medium Priority							
Ramp Meters	■		■			■	
Pre-positioned Emergency Equipment	■		■			■	

Legend: ■ Near Term ■ Mid Term ■ Long Term

Figure 17: Implementation Timeframes

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A.1. NATIONAL TIM PRACTICES

Traffic incident management is practiced in every State and jurisdiction and is a required response to provide medical attention, serve the public, and maintain or restore roadway operations during and after an incident. As such, there has been a significant effort at the national level to develop guidance and establish common practices to ensure consistency across jurisdictional boundaries. Due to the numerous types of responders and professionals involved in traffic incident management, guidance has been developed from various agencies and targeted to various groups, such as transportation professionals, law enforcement, medical responders, and towing providers.

A.1.1. TECHNICAL RESOURCES

The following guidance documents were reviewed as part of this effort:

- Federal Highway Administration (FHWA)
 - Best Practices in Traffic Incident Management (Sept 2010)
 - Traffic Incident Management Handbook (Jan 2010)
 - Traffic Incident Management Gap Analysis Primer (March 2015)
 - Freeway Management and Operations Handbook (Sept 2003)
 - Traffic Incident Management Capability Maturity Self-Assessment National Analysis Report (Nov 2018)
 - SHRP2 National Traffic Incident Management Responder Training Program (L12/L32A/L32B)
- National Highway Institute (NHI)
 - National Traffic Incident Management Responder Training
- Federal Emergency Management A (FEMA) Emergency Management Institute (EMI)
 - Incident Command System (ICS) 300 Training
 - National Incident Management System (NIMS) (Oct 2017)
- AASHTO National Traffic Incident Management Coalition (NTIMC)
 - National Unified Goal (NUG) – 18 strategies
 - Multidisciplinary TIM Core Competencies
- American Traffic Safety Services Association (ATSSA)
 - Incident Traffic Control for Responders Training
- Towing Recovery Association of America (TRAA)
 - Vehicle Identification Reference Guide

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A.1.2. COMMON PRACTICE ORGANIZATION

Information collected from the above resources were reviewed and combined into a set of common practices for traffic incident management. The organization of the common practices, as provided below, is based on a combination of when the practice would be implemented, who would be involved, and where it would occur. Each common practice is briefly described in the remainder of this chapter following the organizational structure.

- On-Scene Emergency Response and Safety
 - Traffic Management Tools and Technology
 - TIM Planning and Training
 - TIM Awareness, Education, and Outreach
 - Legislation
-

A.1.3. ON-SCENE EMERGENCY RESPONSE AND SAFETY

A.1.3.1. RESPONDER COMMUNICATION AND COORDINATION

INCIDENT COMMAND SYSTEM

Traffic incidents often require multiple agencies or functions to operate in coordination to provide a safe, effective, and efficient response. The on-scene management of the various personnel requires leadership and a common direction. The Incident Command System (ICS) was developed to provide a standardized framework for response as well as roles and responsibilities for all responders. The incident commander is a function that is typically assumed by law enforcement or fire personnel but may be temporarily assumed by the first on-scene before being transferred.

CONTACT LISTS

Resource management is a critical component of incident response and requires communication across many agencies and functions. Timely notification of and coordination with the appropriate resources may seem simple in some incidents but can become more difficult with large or complex incidents requiring many response agencies, after-hour incidents, unavailability of primary contact, multiple incidents, or staff turnover. Developing and regularly updating a contact list across multiple agencies can simplify the coordination efforts. Information for each individual should include function,

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response area, cell phone numbers, pager/radio contact, working hours, alternate/backup contact, and other pertinent data.

RESPONSE MATRIX

Response matrices provide responders general guidance on traffic management based on the type of roadway, volume of traffic, expected duration of the incident, number of roadway lanes, and amount of roadway blockage. Every incident will be different, so specific response plans cannot be developed beforehand. The guidance provides possible responses that can be considered and used if appropriate for the specific incident situation. The expected duration categories are less than 30 minutes (minor incident), 30 minutes to 2 hours (intermediate incident) and greater than 2 hours (major incident). The magnitude of roadway blockage ranges from all lanes being blocked to an incident being off the roadway.

REFERENCE LOCATION SIGNS

Enhanced reference markers, also referred to as enhanced reference location signs, provide motorists and responders an additional tool for accurately identifying the location of an incident. Enhanced reference markers are signs posted along the highway that provide the name, direction and mile marker of the highway. Enhanced reference markers are typically placed every one-tenth or two-tenths of a mile along the median of the highway.

A.1.3.2. *RESPONDER VISIBILITY AND SCENE SAFETY*

Maintaining traffic and emergency responder safety at traffic incident scenes is of utmost importance. Secondary incidents involving incident responders often occur when responders are struck by passing vehicles. This section describes several common practices that are foundational to limiting secondary traffic incidents and keeping incident responders safe.

EMERGENCY VEHICLE LIGHTING

While emergency vehicle lighting is needed during the initial stages of responding to traffic incidents, it can be distracting and can create confusion for motorists, especially at night. Emergency vehicle lighting should be reduced once proper traffic control is established particularly at major traffic incidents where a large number of emergency response vehicles are present. As glare from floodlights or vehicle headlights can impair the nighttime vision of approaching road users, it is common practice to turn off any floodlights or vehicle headlights that are not needed for scene illumination or scene safety.

INCIDENT SCENE ILLUMINATION

Proper illumination, or lighting, of the incident area is important to ensure safety of emergency responders. However, emergency responders should exercise caution on the amount and way they

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use lighting to ensure they are not impacting adjacent traffic. Effective practices include using vehicles with special lighting capabilities such as vehicle mounted lighting that can be remotely controlled. Where possible lights should be directed downward and away from on-coming traffic to minimize potential glare or distraction.

EMERGENCY VEHICLE MARKINGS

Highly visible, reflective vehicle markings and emergency lights can enhance safety for emergency vehicles parked in or near moving traffic, particularly during low light or nighttime conditions. Effective practices for vehicle markings include using high-efficiency retroreflective material and concentrating this material lower on emergency vehicle to optimize interaction with approaching vehicles' headlights. At least 50% of rear-facing vertical surfaces should be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. The National Fire Protection Association (NFPA) 1901 Standard for Automotive Fire Apparatus provide full details on reflective striping and marking requirements.

A.1.3.3. CRASH RECONSTRUCTION AND INVESTIGATION

Traffic incidents that involve fatalities typically require a formal investigation that includes the reconstruction of the incident. Depending on the incident, this can be a lengthy process that prohibits opening the roadway to traffic. This section provides and number of effective practices and tools/technology for expediting crash investigation.

TOTAL STATIONS

Total stations are an effective tool for crash investigation and improving incident clearance time versus manual methods. A total station is a surveying instrument that combines an electronic distance meter (which uses an infra-red light to measure distance) and a theodolite (which measures angles). The total station measures distance by sending an infra-red light to a prism on a rod, which is held on the object to be measured, and averaging the time the light takes to move to the prism and return. The total station also includes a computer that stores the data as they are electronically collected. Advances in total station technology have resulted in reflectorless, robotic systems that use GPS applications to make measurements. This has resulted in further time saving to restore normal traffic conditions by eliminating the need to place a prism at points where they were previously needed. Robotic mode allows measuring from a distance via remote control, eliminating need for a second operator to hold a prism pole.

PHOTOGRAMMETRY

Photogrammetry is the science of taking measurements from a photograph. A number of law enforcement agencies have updated their investigative tool kit by obtaining and implementing

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“photogrammetry” software. This software allows investigations to develop very accurate maps of the scene from digital photographs. Photogrammetry is more advanced and easier to use than traditional total stations. This practice involves taking photos in the field and performing measurements and documentation via computer software at a later time in an office environment. The time for an officer to take photos is generally much less than using total stations survey equipment or more traditional (e.g. tape, measuring wheel) methods. Furthermore, photogrammetry reduces incident durations which in turn reduces potential for secondary accidents to occur and improve responder safety.

UNMANNED AERIAL VEHICLES/DRONES

Unmanned aerial vehicles (UAV), or drones, are remote-controlled aircraft that can be operated from the ground. These portable aircraft have the ability to carry varying types of equipment, either built-in or add-on, to perform tasks. Common uses of drones include: video, photography, survey, and environmental sensors (heat, etc). At traffic incidents, drones can be flown over a scene to capture a wider perspective due to the difference in height. Depending on the installed equipment, drone use can provide traffic investigators more data through survey/lidar which may allow further analysis and measurement after-the-fact.

MEDICAL EXAMINER COORDINATION AND PROCEDURES

Crash investigations require adequate data collection and processing to preserve evidence and document conditions. These processes require time and may likely be extended if injuries are significant or fatalities are involved. In fatalities, the requirement of a coroner or medical examiner investigation may add hours to the incident. Developing response processes or policies that enable faster data collection and documentation by means of technology or alternate personnel can improve the time to restore travel.

A.1.3.4. QUICK CLEARANCE AND REMOVAL OPERATIONS

TOWING AND RECOVERY CONTRACTS

Public agencies typically rely on towing and recovery services to remove vehicles after an incident. To speed this process and obtain reliable service, agencies often employ a pre-qualified list of operators that meet defined criteria such as equipment, training, safety record, location, or others. The pre-qualified list allows for quicker contact and response times and ensure adequate resources. Towing and recovery providers may be called on based on location/zone, rotational basis, or other equitable method.

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TOWING AND RECOVERY INCENTIVES

A towing incentive program can improve overall clearance times by incentivizing tow companies to meet specific performance metrics related to response time, clearance time, and/or quality. Typical agreements provide qualified tow companies a bonus if they meet the defined criteria within a given area or zone.

VEHICLE-MOUNTED PUSH BUMPERS

Towing and recovery services are typically notified later in the incident timeline and assist in the final removal of vehicles. Under certain circumstances, there may be a need to move vehicles before the tow service arrives. Law enforcement or other agency vehicles equipped with push bumpers can quickly move disabled vehicles from travel lanes and remove immediate risks and/or restore traffic. The use of these tactics may require Quick Clearance legislation to prevent liability concerns.

PRE-POSITIONED EMERGENCY EQUIPMENT

This practice recognizes that faster access to equipment and medical services at the incident site can greatly facilitate a safe, quick clearance of incidents and emergencies. Examples of this practice can range from storing/positioning traffic control devices (signs, cones, flags, etc.) and other equipment near a high incident location or work zone to similarly positioning service patrol or tow vehicles for faster response. This practice may also include modifying response equipment and vehicles to more easily maneuver in a temporarily constrained area. Temporary vehicle storage (or “drop”) sites must be secure to ensure that resources are available when needed. In addition, agreements should be established between responding agencies regarding material and equipment use.

A.1.4. TRAFFIC MANAGEMENT TOOLS AND TECHNOLOGIES

A.1.4.1. MULTI-AGENCY COORDINATION

JOINT TMC/EMC

A traditional agency traffic management center (TMC) is focused on roadway traffic operations and assisting in the response to all levels of roadway incidents through the use of cameras, DMS, and other ITS field devices. Alternatively, an emergency management center (EMC) is typically focused on responding to large-scale hazards or disasters of various types regardless of location. Co-locating these facilities and functions can improve coordination and allow sharing of resources and staff during events that overlap in scope such as weather events or hazmat.

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ADVANCED TRAFFIC MANAGEMENT SYSTEM SOFTWARE

Advanced traffic management system (ATMS) software is used by transportation operators to remotely monitor and control regional freeway and/or arterial management systems within a TMC. The ATMS software platform controls roadside ITS technologies including but not limited to cameras, dynamic message signs (DMS), and traffic detectors in an integrated manner to manage traffic on the regional transportation network. As new ITS devices are added or planned the ATMS may be enhanced with additional functionality to improve incident management capabilities such as more quickly identifying incidents and more effectively communicating incident details between agencies and public. This could include enhancing inter-agency communications that occur between the TMC and regional emergency service dispatch/PSAPs and CAD systems. Similarly, integration or sharing of CCTV camera images or video with emergency response agencies may improve emergency response operations as well. Other potential enhancements may be identified through development of a performance monitoring program or standard after-action reviews/lessons learned.

COMPUTER AIDED DISPATCH

Incident notification and information is often reported by the public through an emergency 911 center. Relaying this information accurately and quickly to field personnel is a critical component to incident response. Computer-aided dispatch (CAD) systems allow dispatchers to enter information into a central platform that can be accessed and shared by various agencies from remote consoles. The CAD systems allow quick updates without the need to call/radio information. Additional functionality includes the ability to track resources and identify the closest available units to respond. Integration of the CAD into a TMC can further increase coordination between law enforcement and traffic operations staff, and the accuracy and timeliness of public information.

COMMON MUTUAL-AID RADIO FREQUENCIES/CHANNEL

Radio is one of the most direct lines of communication between parties during an incident. Radio communication provides fast, direct, and secure links between field personnel and base operations provided that a common frequency is being utilized. To share communication across agency platforms during a multi-agency incident, agencies need to develop interoperable channels. These can be a single frequency that is shared at a scene or more robust systems that convert and re-broadcast multiple independent frequencies.

DATA/VIDEO SHARING

Some traffic management agencies share CCTV camera images and/or access to their CCTV camera feeds to help speed incident verification and assist response activities. Video and data sharing allow agencies with access to camera images and/or video to initiate a quicker and more proper incident response, thus reducing delay compared to more manual verification methods. Typically, access to

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video and data sharing require a formal agreement between agencies to outline procedures for sharing images and controlling cameras.

A.1.4.2. EVENT DETECTION & REPORTING

CLOSED-CIRCUIT TELEVISION CAMERAS

The timely response to an incident is often determined by knowing the exact location and the extent of the crash. The use of closed circuit television cameras (CCTVs) along corridors or at intersections allows responding agencies to verify the exact location and best route/approach to access the scene particularly in the case of limited-access facilities such as a freeway. CCTVs also allow agencies to monitor the traffic impacts resulting from the incident and modify responses to issues such as queuing.

In addition to permanent roadside CCTVs, some agencies have installed vehicle-mounted cameras that can transmit video back to a TMC or dispatch center. Common applications of these mobile cameras include incident response vehicles and snow plows.

ROAD WEATHER INFORMATION SYSTEMS

Road weather information systems (RWIS) collect data on air temperature, dew point, relative humidity, precipitation type, precipitation intensity, wind speed, and wind direction. RWIS sites may also have pavement sensors that detect pavement temperature, surface condition, and de-icing chemical information. RWIS data can be integrated within other center-based systems to assist with traffic management. This improves situational awareness during weather related events and feed into predictive modeling so that warnings can be issued prior to when weather events occur. RWIS also helps roadway maintenance personnel determine the most effective treatment for a broad range of snow or ice conditions. By archiving weather related information and analyzing it side-by-side with traffic and incident information, operators can gain a greater understanding of how weather impacts traffic and can apply this understanding to proactively respond to these events.

TRAFFIC DETECTION

Timely traffic incident response relies on detection – the process of bringing an incident to the attention of the agency or agencies responsible for maintaining the facility. The more quickly an incident is detected, the more quickly the appropriate response can be dispatched. Quick response minimizes the exposure of those involved in the incident, speeds the implementation of traffic control, reduces the effect on traffic flow and minimizes overall incident impacts. Often motorists driving by an incident scene are the first to detect an incident and notify law enforcement by calling 911. However, incidents may also be detected by law enforcement, freeway service patrol or other responders in the field, or through the traffic management center (via operators, video analytics, or data algorithms).

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A.1.4.3. TRAVELER INFORMATION

511 TRAVELER INFORMATION SYSTEM

Travelers often seek information on roadway conditions when planning a trip or en-route. Agency-specific sources are common and can include telephone-based (511) and/or internet-based (website) platforms. The 511 systems typically allow users to select roadways or regions via numeric or voice control and hear automated information. Websites allow for more interaction and users can obtain more detailed information on incidents.

PORTABLE CHANGEABLE MESSAGE SIGNS

Portable DMSs are used to provide real-time traveler information and advance warning to travelers of known events or a change in driving behavior such as a work zone. The flexibility of portable dynamic message signs allows these signs to be used for a number of applications. Portable DMS are more flexible and less expensive than fixed position DMS, but can generally provide a more limited set of messages.

FIXED DYNAMIC MESSAGE SIGNS

Dynamic Message Signs (DMS) are permanent, structure-mounted, electronic signs located on some segments of streets and highways. DMS are normally controlled remotely from a TMC. DMS can be used to provide advance warning messages to motorists of downstream traffic incidents.

END OF QUEUE NOTIFICATION / LANE CONTROL SIGNS

As responders are working a traffic incident, queuing traffic in the travel way creates a risk of secondary crashes as unexpected drivers approach the back of queue. This risk increases with the length of queue and the speed differential. Providing an end-of-queue notification for approaching traffic can help provide warning and mitigate the risk. Advanced warning can be in the form of fixed overhead or shoulder mount DMS, lane use signs installed over individual lanes, a truck-mounted arrow board, or a response vehicle with emergency lights activated.

A.1.4.4. INCIDENT RESPONSE AND TRAFFIC MANAGEMENT

SAFETY SERVICE PATROLS

The clearance of traffic incidents, regardless of severity, often relies on having the appropriate resources arrive at the scene as quickly as possible. Many agencies have established service patrols – trained drivers with well-equipped vehicles – that can assist motorists, handle minor incidents, and/or quickly support major incidents. The patrols, which can operate 24/7 or during peak periods,

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have equipment to remove debris, push/pull vehicles, set traffic control, and assist motorists (fuel, flat tires, batteries).

MOTORCYCLE PATROLS

Quick response to incidents may be hindered due to traffic congestion, limited access, lack of shoulders, or other physical constraints. Motorcycle patrol units provide a distinct advantage to incident response due to their smaller size and maneuverability in congested urban areas. While motorcycle units are limited in the equipment that they can carry, they can provide valuable aid until other resources arrive. Motorcycle units often assess the scene, identify needed resources, provide first aid, and secure the scene through immediate traffic control.

RAMP METERS

Ramp meters control the rate at which traffic can enter a freeway from an interchange on-ramp. During an incident, the operation of these devices can be modified to assist the response. If the incident is near an on-ramp, the metering rate can be slowed to reduce the number of vehicles approaching the scene. If an emergency responder is en-route along a metered route, the metering rate can be modified to speed the response.

TRAFFIC SIGNAL CONNECTIVITY AND ENHANCEMENTS

This practice potentially includes fiber optic signal interconnect, signal controller and cabinet upgrades, detection and implementation of a responsive or adaptive traffic signal control systems along alternate routes to help manage the dynamic fluctuation in traffic demand that may occur as a result of incidents. This will result in reduction in delay and reduced congestion when compared to fixed signal timing.

EMERGENCY VEHICLE TURN AROUND/MEDIAN BREAKS

Access to traffic incident scenes is critical for efficient emergency response and safety. Oftentimes, responders must access the scene from the opposite direction due to congestion. Median breaks and turnarounds facilitate access to incident scenes.

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A.1.5. TIM PLANNING AND TRAINING

A.1.5.1. TIM PLANNING

TIM STRATEGIC PLAN

Traffic incident management encompasses many aspects of law enforcement, traffic safety, medical response, insurance, and other disciplines. The combination of the various functions and the multi-agency involvement requires upfront planning and management to be successful during the response. A strategic plan or other formalized program helps establish the framework for the overall TIM response in terms of goals, strategies, procedures, resources, and performance measures.

ALTERNATE ROUTE PLANS

Managing traffic during an incident exposes first responders and system users to risk of secondary crashes and injury. Identifying and providing defined alternate routes away from the incident allows agencies to reduce traffic volumes near the incident and reduce risk exposure and traffic delays. Alternate routes should be developed in cooperation with adjacent agencies and be adequate in terms of facility type, condition, and environment. Inter-agency agreements may be needed to formalize the routes and/or support the route in terms of temporary signing.

TABLE-TOP EXERCISES

TIM training and education is a basic element in preparation but does not provide practical experience if done individually through printed or online material. Table-top exercises are in-person events in which participants are provided real-world scenarios and roles that allow for an interactive training session. These exercises provide a low-cost method to understand situational awareness, visualize impacts of actions on others, improve coordination, and identify areas of weakness.

AFTER ACTION REVIEWS

An after action review provides an opportunity to review the effectiveness of incident response actions and the quality of service provided during an incident. It also provides an opportunity to determine how to improve traffic incident management in similar cases or even in general. This effort typically occurs as soon as possible after an incident and involves all agencies involved in the incident response. While the magnitude of the impact caused by an incident should dictate the extent of an after action review, some level of critique should be done for every incident as a learning process that enables incident responders to achieve continuous improvement and improve teamwork.

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A.1.5.2. RESPONDER TRAINING

NATIONAL TIM TRAINING

Training resources for traffic incident management are available from several well-established national organizations that can be leveraged and incorporated within local, regional and state TIM training. These include the Federal Highway Administration's National Highway Institute (NHI), the Federal Highway Administration courses developed under the Strategic Highway Research Program (SHRP 2), the National Incident Management Coalition (NIMC), the American Traffic Safety Services Association (ATSSA), and the Towing and Recovery Association of America (TRAA). Each of these organizations have website where training and education resources can be viewed and/or downloaded. An example is the National Highway Institute (NHI) offers a free web-based National Traffic Incident Management Responder Training course developed under FHWA's SHRP2 initiative.

TIM RESPONDER CERTIFICATIONS

Identifying and providing access to available training resources is an important step in developing a knowledgeable workforce. To ensure that staff complete fundamental TIM training and periodic refresher courses, many agencies have established formal TIM training requirements for staff. These vary depending on position but typically all field-based personnel must be familiar with the basics of TIM. Staff that are routinely involved in incident response may be required to complete more specialized training or certification.

TRAIN-THE-TRAINER

Train-the-Trainer programs are intended to provide participants (i.e., trainers) the knowledge and materials necessary for them to conduct TIM training for responders in their area or state. The national curriculum was developed under SHRP2 (Strategic Highway Research Program) and is designed to provide unified training for all traffic incident responders – law enforcement, fire, EMS, DOT, and towing/recovery. The goal is to improve on-scene operations to achieve quick clearance and responder safety. Typically, these programs are limited to a 1 or 2-day course that includes classroom training and hands-on activities.

RESPONSE VEHICLE POSITIONING/PARKING PLANS

Vehicles and equipment involved in the incident response are typically needed close to the activity but also have a role in protecting the responders and the scene. A balance is needed between the space provided to the incident scene and the number of travel lanes blocked. Vehicles should also be positioned in a manner that allows an adequate buffer to passing traffic, provides sufficient visibility of emergency lights to approaching traffic, and prevents encroachment into the scene if stuck.

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HAZARDOUS MATERIALS IDENTIFICATION

Hazardous materials can be identified through labels, markings or placards placed on the actual item or the individual package that the material is contained in. Placards, which should be placed on each side and each end of the transport vehicle, are typically the first reference that responders use when trying to identify a hazardous material. Placards are color-coded based on the class of hazardous material being transported and should include a four-digit number that can be referenced to identify the hazardous material using the Emergency Response Guidebook (ERG). It is important that emergency responders always verify what material is being transported during an incident prior to initiating any recovery efforts. Training on how to manage hazardous material can improve the safety of all involved.

TOWING AND RECOVERY VEHICLE ID GUIDE

To assist towing and recovery agencies respond with the correct equipment, agencies have developed vehicle identification cards or quick reference guides that can be used in the field to assist first responders in identifying vehicles that need to be towed or removed. These cards, which can be stored for quick reference within a vehicle's visor, help prevent delays that may occur when incorrect equipment is brought on scene to remove damaged vehicles. The card or guide typically identifies the types of vehicles belonging to a particular vehicle class and provides details such as expected gross vehicle weight and number of tires.

A.1.6. TIM AWARENESS, EDUCATION AND OUTREACH

A.1.6.1. PUBLIC EDUCATION

MEDIA EDUCATION TOOLS

Many states have engaged the media to educate the public on various traffic safety issues, including issues related to traffic incident management. General traffic safety messages, such as those related to distracted driving, speeding, or impairment, are intended to reduce the number of traffic crashes. Others, such as Move Over or Move It, are focused on incident safety at a scene. Agencies can develop their own educational materials or utilize those available through TIM advocacy organizations like the Emergency Responder Safety Institute. Many online resources can be used in their current form or adapted to meet specific laws or policies of the local agency. It is often important for public information officers to quickly push information to the public when new laws are enacted or when emergency responders are involved in incidents to motivate the public to exercise caution.

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PUBLIC-PRIVATE PARTNERSHIPS

Some states have engaged in public-private partnerships where private companies have funded or operate TIM-oriented tools such as safety service patrols and rest areas. In exchange for funding or operating TIM strategies, the private entity usually can advertise their services on public agency signs or safety service vehicles free of charge.

A.1.6.2. UPPER MANAGEMENT ENGAGEMENT

Obtaining desired resources for TIM efforts requires approval by executive-level leadership who are decision-makers on policy and funding. Educating executive-level staff on the benefits of TIM is necessary and may require varying justification ranging from agency benefits (performance measures), public benefits (safety, delay), and inter-agency cooperation. Education can be provided in traditional documents and presentations or through facility tours and “ride-alongs” where decision-makers can experience the TIM environment.

PERFORMANCE MANAGEMENT

Setting consistent performance measures allows agencies the ability to track performance over time and to measure the effectiveness of changes to existing practices or the impact of new strategies. At a national level, the primary TIM performance measures are roadway clearance time, incident clearance time, and the number of secondary incidents.

ANNUAL TIM SELF-ASSESSMENT

Periodic self-assessment of any program can provide insight into the breadth and depth of adoption and implementation of the various initiatives. In a program like TIM where there are multiple agencies, various functions/resources, and a significant number of strategies, it is important to assess which areas are strong and which areas need additional focus. FHWA has developed a standardized annual assessment that can provide TIM champions/leaders a defined process and set of questions to utilize in their assessment.

LINK PERFORMANCE WITH FUNDING

Limited funding and resources often require a careful assessment on the value of expenditures relative to program goals/objectives. By developing a link between funding and adopted performance measures, agencies can justify and communicate funding requests to executive leadership and the general public. Linking the performance measures to funding can support the continuation of program efforts or support new requests.

APPENDIX

A.1.7. LEGISLATION

A.1.7.1. *TIM LEGISLATION*

AUTHORITY REMOVAL LAWS

Quickly removing damaged or inoperable vehicles from the roadway after an incident improves safety for the responders and the general public by restoring conditions to normal. By expediting clearance, the potential for secondary collisions and/or injury to responders or other persons is reduced. Many states have enacted legislation that provides responders the authority to physically remove obstructing vehicles/objects by any means necessary rather than wait for traditional towing and recovery equipment. The legislation typically provides immunity from liability to the responder if the condition was creating a hazard.

DRIVER REMOVAL LAWS (STEER IT, CLEAR IT)

This legislation requires drivers involved in minor crashes to remove their vehicle from the travel lane if the vehicle is still operable and there are no personal injuries.

ABANDONED VEHICLE LAWS

Vehicles that are abandoned on the roadside due to flat tires, mechanical issues, or lack of fuel can create a hazard. These vehicles may obstruct the shoulder and/or encroach into the buffer zone of a travel lane. To reduce the hazard, states can enact legislation that provides law enforcement the authority to remove the vehicles. Immediate removal may be necessary if the risk is apparent and high; otherwise, states can employ a tag/sticker notification that allows drivers a certain timeframe to remove the vehicle prior to an enforced removal.

SLOW DOWN/MOVE OVER LAWS

Incident responders and all roadway workers are exposed to live traffic and hazards when working in or near travel lanes. Slow Down & Move Over laws aim to address this hazard by requiring motorists to change lanes and/or slow down when approaching an authorized emergency vehicle that is parked or otherwise stopped on a roadway. The specifics of the laws vary across states – some apply to any emergency vehicle, others require active emergency lights – but all aim at increasing awareness of the incident scene and reducing the potential for secondary crashes.

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A.2. TIM RESPONSE TEMPLATES

Traffic incident management requires the execution of many diverse strategies to detect and respond to incidents, safely manage the scene, accommodate active traffic, and communicate with the public. While many of these strategies are specific to particular TIM stakeholders, the TMC serves as a central coordination point in many steps and certainly in the data collection and dissemination of public information. In an effort to ensure that TMC operators engage all major TIM stakeholders and trigger the appropriate strategies, response templates have been developed to provide a checklist based on the type of incident.

In order to provide flexibility while also limiting the complexity of the response templates, the templates are built around a matrix of incident “levels”. Each level represents an order of magnitude relative to traffic impacts with “Level 1” being low impact to “Level 4” being severe impact. TMC operators should use available information to select the appropriate level of incident early in the response timeline. The tables below consider the incident location (facility type), time-of-day, and number of lanes blocked to assess the level and corresponding response template. For instance, an incident on a major arterial crossing the Rio Grande would be considered a Level 1 if it blocked one lane and occurred at 10:00 PM. However, a similar incident in the same location would be considered a Level 3 if it blocked one lane during the peak commute hours.

As incidents progress, it may be necessary for TMC operators to move from one level response template to another in order to adjust to the observed conditions. For instance, an interstate incident that blocks two lanes at 5:00 AM may be a Level 2 initially but will necessitate a Level 4 response if it remains with two lanes blocked into the peak period (6:00 AM). Similarly, a higher level incident may be reduced if incident responders are able to open lanes (reduce impact) and/or the incident duration extends into off peak hours.

The following content is provided for operator reference:

- Response level matrix guide
- Level 1 Response Template
- Level 2 Response Template
- Level 3 Response Template
- Level 4 Response Template
- Critical Areas/Items to Continuously Monitor

It should be noted that these Response Templates are intended for use on incidents that both impact traffic operations and require a multi-faceted response. These Response Templates are not necessary for abandoned vehicles on the right-hand shoulder, debris blocking a shoulder, or other minor occurrences.

In addition, the Response Templates provide a checklist and general guidance to ensure that all major functions are considered. The functions listed in a template do not represent a timeline or linear process – some items may be skipped or performed in a different order depending on the situation and incident response.

For contact information, the NMDOT District 3 Traffic maintains a current contact list for the regional AMPA stakeholders involved in traffic incident management. The list provides key points of contact for each agency/service provider and phone numbers.

APPENDIX

Interstate 25 Interstate 40	Off-Peak Hours (8 PM – 6 AM)	Typical Midday (9 AM – 4 PM)	Peak-Periods (6 AM – 9 AM, 4 PM – 8 PM) Special Event
Shoulder Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
1 Lane Blocked	Level 1 (Low)	Level 2 (Medium)	Level 3 (High)
2+ Lanes Blocked	Level 2 (Medium)	Level 3 (High)	Level 4 (Severe)
Full Closure	Level 3 (High)	Level 4 (Severe)	Level 4 (Severe)

Major Arterials (State Highways or Local Agency River Crossings)	Off-Peak Hours (8 PM – 6 AM)	Typical Midday (9 AM – 4 PM)	Peak-Periods (6 AM – 9 AM, 4 PM – 8 PM) Special Event
Shoulder Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
1 Lane Blocked	Level 1 (Low)	Level 2 (Medium)	Level 3 (High)
2+ Lanes Blocked	Level 2 (Medium)	Level 3 (High)	Level 4 (Severe)
Full Closure	Level 2 (Medium)	Level 4 (Severe)	Level 4 (Severe)

Major Arterials (Local Agency)	Off-Peak Hours (8 PM – 6 AM)	Typical Midday (9 AM – 4 PM)	Peak-Periods (6 AM – 9 AM, 4 PM – 8 PM) Special Event
Shoulder Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
1 Lane Blocked	Level 1 (Low)	Level 1 (Low)	Level 2 (Medium)
2+ Lanes Blocked	Level 1 (Low)	Level 2 (Medium)	Level 3 (High)
Full Closure	Level 2 (Medium)	Level 3 (High)	Level 4 (Severe)

APPENDIX

Response Level 1	
Law Enforcement (as needed)	<p><u>If not on-scene, TMC operators to notify NM DPS/Police/Sheriff dispatch (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction), and number/type of vehicles. • Provide known details on lane closures, access restrictions, and any visible vehicular fire.
EMS/Fire (as needed)	<p><u>NM DPS/Police/Sheriff to request EMS/Fire (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on injuries (number of victims and injury severity). • Provide known details on fire (vehicle type, cargo, hazardous placards).
Courtesy Patrol (if applicable)	<p><u>If not on-scene, TMC operators to dispatch HELP courtesy patrol (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction). • Provide known details on vehicle conditions, traffic control needs, and debris.
HAZMAT (as needed)	<p><u>NM DPS/Police/Sheriff to request HAZMAT from NMSP (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on vehicle type, cargo, hazardous placards, and spillage/debris extents.
Traffic Operations - Roadway Owner	<p><u>TMC operators to notify internal agency staff using distribution list (via email)</u> <u>TMC operators to monitor roadway conditions</u></p> <ul style="list-style-type: none"> • TMC operators to utilize Courtesy Patrol, NM DPS/Police/Sheriff radio, and CCTV images as available to continuously monitor critical areas identified (see attached sheet). • Relay updated information to Courtesy Patrol, NM DPS/Police/Sheriff, and traffic operations staff.
Traffic Operations - Adjacent Agencies	N/A
Temporary Traffic Control - Roadway Owner	<p><u>Agency to coordinate for temporary traffic control (TTC) as requested by on-scene responders</u></p> <ul style="list-style-type: none"> • Support with use of vehicle positioning and arrow boards • Place TTC as needed to direct traffic. • Place TTC further upstream to manage end-of-queue.
Traveler Information	<p><u>TMC operators to enter roadway conditions in the ATMS and NMRoads/CABQRoads platforms</u></p> <ul style="list-style-type: none"> • Provide roadway incident data (location, estimated duration, delay)
DMS	<p><u>TMC operators to activate upstream DMS boards through ATMS</u></p> <ul style="list-style-type: none"> • Display information on incident location, lane closures, delay
511/NMRoads	<p><u>TMC operators to enter data into NMRoads/CABQRoads</u></p> <ul style="list-style-type: none"> • 511 phone system will self-populate based on information entered in NMRoads/CABQRoads

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	<ul style="list-style-type: none"> NMRoads/CABQRoads platform will send automated incident alerts/notifications to subscribers based on criteria NMDOT to update information as required
Media	N/A
Transit Providers	<u>Transit to monitor alerts from NMRoads/CABQRoads</u> <ul style="list-style-type: none"> Transit agencies to read alerts/notifications from NMRoads/CABQRoads that contain incident information and determine impact to service.
Towing (as needed)	<u>NM DPS/Police/Sheriff to request towing from approved list (via dispatch)</u> <ul style="list-style-type: none"> Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). Provide known details on number and type of vehicles, condition, and position.
Heavy Vehicle	<u>NM DPS/Police/Sheriff to request specialized towing (via dispatch)</u> <ul style="list-style-type: none"> Provide known details on heavy vehicle type, cargo, hazardous placards, condition, and position.
Office of Medical Investigator (as needed)	<u>NM DPS/Police/Sheriff to request OMI if fatality (via dispatch)</u> <ul style="list-style-type: none"> Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). Provide known details on fatalities (number of victims, time of incident, type of incident).
Incident Resolution	<u>TMC operators to clear prior steps as necessary</u> <ul style="list-style-type: none"> Clear traveler information systems – ATMS, NMRoads/CABQRoads, DMS. Reposition CCTVs to standard positions for video analytics. Send out notifications of incident clearance.
Performance Metrics	<u>TMC engineer to summarize response performance</u> <ul style="list-style-type: none"> Document incident timeline from ATMS and NMRoads/CABQRoads entries and other sources. Provide TIM performance measure summary for after-action debrief.
After-Action Debrief	<u>Agency to conduct an after-action debrief (as needed)</u> <ul style="list-style-type: none"> For Level 1 incidents as needed, agency to arrange an after-action debrief within 5 days with all responding stakeholders. Agency to summarize and document for lessons learned.

APPENDIX

Response Level 2	
Law Enforcement (as needed)	<p><u>If not on-scene, TMC operators to notify NM DPS/Police/Sheriff dispatch (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction), and number/type of vehicles. • Provide known details on lane closures, access restrictions, and any visible vehicular fire.
EMS/Fire (as needed)	<p><u>NM DPS/Police/Sheriff to request EMS/Fire (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on injuries (number of victims and injury severity). • Provide known details on fire (vehicle type, cargo, hazardous placards).
Courtesy Patrol (if applicable)	<p><u>If not on-scene, TMC operators to dispatch HELP courtesy patrol (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction). • Provide known details on vehicle conditions, traffic control needs, and debris.
HAZMAT (as needed)	<p><u>NM DPS/Police/Sheriff to request HAZMAT from NMSP (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on vehicle type, cargo, hazardous placards, and spillage/debris extents.
Traffic Operations - Roadway Owner	<p><u>TMC operators to notify internal agency staff using distribution list (via email)</u> <u>TMC operators to monitor roadway conditions</u></p> <ul style="list-style-type: none"> • TMC operators to utilize Courtesy Patrol, NM DPS/Police/Sheriff radio, and CCTV images as available to continuously monitor critical areas identified (see attached sheet). • Relay updated information to Courtesy Patrol, NM DPS/Police/Sheriff, and traffic operations staff. <p><u>Agency to adjust traffic signal operations</u></p> <ul style="list-style-type: none"> • Modify traffic signal timing at intersections to manage queues. • Modify ramp metering (if present) as required.
Traffic Operations - Adjacent Agencies	<p><u>TMC operators to notify adjacent agencies of diverting traffic (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident location, identified diversion route(s), and estimated duration. <p><u>Adjacent agencies to adjust traffic signal operations.</u></p>
Temporary Traffic Control - Roadway Owner	<p><u>Agency to coordinate for temporary traffic control (TTC) as requested by on-scene responders</u></p> <ul style="list-style-type: none"> • Support with use of vehicle positioning and arrow boards • Place TTC as needed to direct traffic. If full closure, close roadway at nearest major intersection/off-ramp. • Place TTC further upstream to manage end-of-queue. • Restrict use of on-ramps as needed to reduce traffic demand.

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Traveler Information	<p><u>TMC operators to enter roadway conditions in the ATMS and NMRoads/CABQRoads platforms</u></p> <ul style="list-style-type: none"> • Provide roadway incident data (location, estimated duration, delay)
DMS	<p><u>TMC operators to activate upstream DMS boards through ATMS</u></p> <ul style="list-style-type: none"> • Display information on incident location, lane closures, delay
511/NMRoads	<p><u>TMC operators to enter data into NMRoads/CABQRoads</u></p> <ul style="list-style-type: none"> • 511 phone system will self-populate based on information entered in NMRoads/CABQRoads • NMRoads/CABQRoads platform will send incident alerts/notifications to subscribers based on criteria <p><u>NMDOT to update information as required</u></p>
Media	<p><u>Agency PIO to distribute media outreach</u></p> <ul style="list-style-type: none"> • Release social media content (full closure or major impact only)
Transit Providers	<p><u>Transit to monitor alerts from NMRoads/CABQRoads</u></p> <ul style="list-style-type: none"> • Transit agencies to read alerts/notifications from NMRoads/CABQRoads that contain incident information and determine impact to service.
Towing (as needed)	<p><u>NM DPS/Police/Sheriff to request towing from approved list (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on number and type of vehicles, condition, and position.
Heavy Vehicle	<p><u>NM DPS/Police/Sheriff to request specialized towing (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide known details on heavy vehicle type, cargo, hazardous placards, condition, and position.
Office of Medical Investigator (as needed)	<p><u>NM DPS/Police/Sheriff to request OMI if fatality (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on fatalities (number of victims, time of incident, type of incident).
Incident Resolution	<p><u>TMC operators to clear prior steps as necessary</u></p> <ul style="list-style-type: none"> • Clear traveler information systems – ATMS, NMRoads/CABQRoads, DMS. • Reposition CCTVs to standard positions for video analytics. • Send out notifications of incident clearance. • Notify adjacent agencies relative to diversion traffic. <p><u>Agency PIO to provide “clear, open” media outreach.</u></p>
Performance Metrics	<p><u>TMC engineer to summarize response performance</u></p> <ul style="list-style-type: none"> • Document incident timeline from ATMS and NMRoads/CABQRoads entries and other sources. • Provide TIM performance measure summary for after-action debrief.
After-Action Debrief	<p><u>Agency to conduct an after-action debrief (as needed)</u></p> <ul style="list-style-type: none"> • For all full closure and other Level 2 incidents as needed, agency to arrange an after-action debrief within 5 days with all responding stakeholders. • Agency to summarize and document for lessons learned.

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Response Level 3	
Law Enforcement (as needed)	<p><u>If not on-scene, TMC operators to notify NM DPS/Police/Sheriff dispatch (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction), and number/type of vehicles. • Provide known details on lane closures, access restrictions, and any visible vehicular fire.
EMS/Fire (as needed)	<p><u>NM DPS/Police/Sheriff to request EMS/Fire (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on injuries (number of victims and injury severity). • Provide known details on fire (vehicle type, cargo, hazardous placards).
Courtesy Patrol (if applicable)	<p><u>If not on-scene, TMC operators to dispatch HELP courtesy patrol (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction). • Provide known details on vehicle conditions, traffic control needs, and debris.
HAZMAT (as needed)	<p><u>NM DPS/Police/Sheriff to request HAZMAT from NMSP (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on vehicle type, cargo, hazardous placards, and spillage/debris extents.
Traffic Operations - Roadway Owner	<p><u>TMC operators to notify internal agency staff using distribution list (via email)</u> <u>TMC operators to monitor roadway conditions</u></p> <ul style="list-style-type: none"> • TMC operators to utilize Courtesy Patrol, NM DPS/Police/Sheriff radio, and CCTV images as available to continuously monitor critical areas identified (see attached sheet). • Relay updated information to Courtesy Patrol, NM DPS/Police/Sheriff, and traffic operations staff. <p><u>Agency to adjust traffic signal operations</u></p> <ul style="list-style-type: none"> • Modify traffic signal timing at intersections to manage queues. • Modify ramp metering (if present) as required.
Traffic Operations - Adjacent Agencies	<p><u>TMC operators to notify adjacent agencies of diverting traffic (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident location, identified diversion route(s), and estimated duration. <p><u>Adjacent agencies to adjust traffic signal operations.</u></p>
Temporary Traffic Control - Roadway Owner	<p><u>Agency to coordinate for temporary traffic control (TTC) as requested by on-scene responders</u></p> <ul style="list-style-type: none"> • Support with use of vehicle positioning and arrow boards • Place TTC as needed to direct traffic. If full closure, close roadway at nearest major intersection/off-ramp. • Place TTC further upstream to manage end-of-queue. • Restrict use of on-ramps as needed to reduce traffic demand.

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Traveler Information	<p><u>TMC operators to enter roadway conditions in the ATMS and NMRoads/CABQRoads platform</u></p> <ul style="list-style-type: none"> • Provide roadway incident data (location, estimated duration, delay)
DMS	<p><u>TMC operators to activate upstream DMS boards through ATMS</u></p> <ul style="list-style-type: none"> • Display information on incident location, lane closures, delay
511/NMRoads	<p><u>TMC operators to enter data into NMRoads/CABQRoads</u></p> <ul style="list-style-type: none"> • 511 phone system will self-populate based on information entered in NMRoads/CABQRoads • NMRoads/CABQRoads platform will send automated incident alerts/notifications to subscribers based on criteria NMDOT to update information as required.
Media	<p><u>Agency PIO to distribute media outreach</u></p> <ul style="list-style-type: none"> • Release social media content
Transit Providers	<p><u>Transit to monitor alerts from NMRoads/CABQRoads</u></p> <ul style="list-style-type: none"> • Transit agencies to read alerts/notifications from NMRoads/CABQRoads that contain incident information and determine impact to service.
Towing (as needed)	<p><u>NM DPS/Police/Sheriff to request towing from approved list (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on number and type of vehicles, condition, and position.
Heavy Vehicle	<p><u>NM DPS/Police/Sheriff to request specialized towing (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide known details on heavy vehicle type, cargo, hazardous placards, condition, and position.
Office of Medical Investigator (as needed)	<p><u>NM DPS/Police/Sheriff to request OMI if fatality (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on fatalities (number of victims, time of incident, type of incident).
Incident Resolution	<p><u>TMC operators to clear prior steps as necessary</u></p> <ul style="list-style-type: none"> • Clear traveler information systems – ATMS, NMRoads/CABQRoads, DMS. • Reposition CCTVs to standard positions for video analytics. • Send out notifications of incident clearance. • Notify adjacent agencies relative to diversion traffic. <p><u>Agency PIO to provide “clear, open” media outreach.</u></p>
Performance Metrics	<p><u>TMC engineer to summarize response performance</u></p> <ul style="list-style-type: none"> • Document incident timeline from ATMS and NMRoads/CABQRoads entries, and other sources. • Provide TIM performance measure summary for after-action debrief.
After-Action Debrief	<p><u>Agency to conduct an after-action debrief (as needed)</u></p> <ul style="list-style-type: none"> • For all full-closure and other Level 3 incidents as needed, agency to arrange an after-action debrief within 5 days with all responding stakeholders. • Agency to summarize and document for lessons learned.

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Response Level 4	
Law Enforcement (as needed)	<p><u>If not on-scene, TMC operators to notify NM DPS/Police/Sheriff dispatch (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction), and number/type of vehicles. • Provide known details on lane closures, access restrictions, and any visible vehicular fire.
EMS/Fire (as needed)	<p><u>NM DPS/Police/Sheriff to request EMS/Fire (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on injuries (number of victims and injury severity). • Provide known details on fire (vehicle type, cargo, hazardous placards).
Courtesy Patrol (if applicable)	<p><u>If not on-scene, TMC operators to dispatch HELP courtesy patrol (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), travel direction (cardinal direction). • Provide known details on vehicle conditions, traffic control needs, and debris.
HAZMAT (as needed)	<p><u>NM DPS/Police/Sheriff to request HAZMAT from NMSP (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on vehicle type, cargo, hazardous placards, and spillage/debris extents.
Traffic Operations - Roadway Owner	<p><u>TMC operators to notify internal agency staff using distribution list (via email)</u></p> <p><u>TMC operators to monitor roadway conditions</u></p> <ul style="list-style-type: none"> • TMC operators to utilize Courtesy Patrol, NM DPS/Police/Sheriff radio, and CCTV images as available to continuously monitor critical areas identified (see attached sheet). • Relay updated information to Courtesy Patrol, NM DPS/Police/Sheriff, and traffic operations staff. <p><u>Agency to adjust traffic signal operations</u></p> <ul style="list-style-type: none"> • Modify traffic signal timing at intersections to manage queues. • Modify ramp metering (if present) as required.
Traffic Operations - Adjacent Agencies	<p><u>TMC operators to notify adjacent agencies of diverting traffic (via phone)</u></p> <ul style="list-style-type: none"> • Provide incident location, identified diversion route(s), and estimated duration. <p><u>Adjacent agencies to adjust traffic signal operations.</u></p>
Temporary Traffic Control - Roadway Owner	<p><u>Agency to coordinate for temporary traffic control (TTC) as requested by on-scene responders</u></p> <ul style="list-style-type: none"> • Support with use of vehicle positioning and arrow boards • Place TTC as needed to direct traffic. If full closure, close roadway at nearest major intersection/off-ramp. • Place TTC further upstream to manage end-of-queue. • Restrict use of on-ramps as needed to reduce traffic demand.

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Traveler Information	<p><u>TMC operators to enter roadway conditions in the ATMS and NMRoads/CABQRoads platforms</u></p> <ul style="list-style-type: none"> • Provide roadway incident data (location, estimated duration, delay, possible detour)
DMS	<p><u>TMC operators to activate upstream DMS boards through ATMS</u></p> <ul style="list-style-type: none"> • Display information on incident location, lane closures, delay
511/NMRoads	<p><u>TMC operators to enter data into NMRoads/CABQRoads</u></p> <ul style="list-style-type: none"> • 511 phone system will self-populate based on information entered in NMRoads/CABQRoads • NMRoads/CABQRoads platform will send automated incident alerts/notifications to subscribers based on criteria <p><u>NMDOT to update information as required</u></p>
Media	<p><u>Agency PIO to distribute media outreach</u></p> <ul style="list-style-type: none"> • Release social media content • Release formal press release
Transit Providers	<p><u>Transit to monitor alerts from NMRoads/CABQRoads</u></p> <ul style="list-style-type: none"> • Transit agencies to read alerts/notifications from NMRoads/CABQRoads that contain incident information and determine impact to service.
Towing (as needed)	<p><u>NM DPS/Police/Sheriff to request towing from approved list (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on number and type of vehicles, condition, and position.
Heavy Vehicle	<p><u>NM DPS/Police/Sheriff to request specialized towing (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide known details on heavy vehicle type, cargo, hazardous placards, condition, and position.
Office of Medical Investigator (as needed)	<p><u>NM DPS/Police/Sheriff to request OMI if fatality (via dispatch)</u></p> <ul style="list-style-type: none"> • Provide incident roadway name, location (milepost or crossroad), and travel direction (cardinal direction). • Provide known details on fatalities (number of victims, time of incident, type of incident).
Incident Resolution	<p><u>TMC operators to clear prior steps as necessary</u></p> <ul style="list-style-type: none"> • Clear traveler information systems – ATMS, NMRoads/CABQRoads, DMS. • Reposition CCTVs to standard positions for video analytics. • Send out notifications of incident clearance. • Notify adjacent agencies relative to diversion traffic. <p><u>Agency PIO to provide “clear, open” media outreach.</u></p>
Performance Metrics	<p><u>TMC engineer to summarize response performance</u></p> <ul style="list-style-type: none"> • Document incident timeline from ATMS and NMRoads/CABQRoads entries, and other sources. • Provide TIM performance measure summary for after-action debrief.

APPENDIX

After-Action Debrief	<u>Agency to conduct an after-action debrief</u> <ul style="list-style-type: none">• For all Level 4 incidents, agency to arrange an after-action debrief within 5 days with all responding stakeholders.• Agency to summarize and document for lessons learned.
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APPENDIX

Critical Areas/Items to Continuously Monitor

The following items should be continuously monitored through observations from responders in field, TMC/agency cameras, public calls to 911, third-party data, or other public data sources.

<p>Interstate Mainline Queuing Vehicle queuing on the mainline caused by excessive drop in speed or stopped traffic and extending beyond 1 mile.</p>	<p>Response to All Occurrences</p> <ul style="list-style-type: none"> • TMC operator to contact NMDPS/Police/Sheriff to deploy an emergency vehicle for end-of-queue warning (flashing lights). • TMC operator to post “queue ahead” warning message on available upstream DMS. <p>Response if Greater than 90 minutes Duration</p> <ul style="list-style-type: none"> • TMC operator to contact DOT maintenance to setup appropriate lane drop traffic control. • TMC operator to contact adjacent agencies (as needed) for diverting traffic.
<p>Off-ramp Queuing Vehicle queuing on an interstate off-ramp extending to the mainline caused by inability to efficiently clear ramp terminal intersection or by downstream arterial congestion.</p>	<p>Response to All Occurrences</p> <ul style="list-style-type: none"> • TMC operator to contact NMDPS/Police/Sheriff to deploy an emergency vehicle for end-of-queue warning (flashing lights). • TMC operator to post “queue at exit” warning message on available upstream DMS. <p>Response if Greater than 90 minutes Duration</p> <ul style="list-style-type: none"> • TMC operator to contact adjacent agency (possibly TMC operator) to evaluate and/or change interchange traffic signal timing.
<p>On-ramp Queuing Vehicle queuing on an interstate on-ramp caused by interstate mainline queuing extending to arterial intersection.</p>	<p>Response to All Occurrences</p> <ul style="list-style-type: none"> • TMC operator to contact adjacent agency (possibly TMC operator) to evaluate and/or change interchange traffic signal timing. <p>Response if Greater than 90 minutes Duration</p> <ul style="list-style-type: none"> • TMC operator to contact adjacent agency to evaluate for temporary traffic control on arterial approach.
<p>Arterial Traffic Signal Operations Vehicle queuing at a signalized intersection caused by unbalanced traffic operations, or traffic signal failure, and extending beyond ½ mile.</p>	<p>Response to All Occurrences</p> <ul style="list-style-type: none"> • Local transportation agency to contact Police/Sheriff to manually operate traffic signal to clear queues. <p>Response if Greater than 90 minutes Duration</p> <ul style="list-style-type: none"> • Local transportation agency to evaluate and/or change traffic signal timing. • Local transportation agency to deploy temporary changeable message boards.

APPENDIX

<p>Arterial Unsignalized Operations Vehicle queuing at an unsignalized intersections caused by increased traffic rerouting and extending beyond ¼ mile.</p>	<p>Response to All Occurrences</p> <ul style="list-style-type: none"> Local transportation agency to contact Police/Sheriff to manually enforce traffic and prevent intersection blockages. <p>Response if Greater than 90 minutes Duration</p> <ul style="list-style-type: none"> Local transportation agency to evaluate for temporary traffic control (restrictions) on stop-controlled approach.
<p>At-grade Railroad Crossings Vehicle queuing along a roadway that extends and crosses an at-grade railroad crossing.</p>	<p>Response to All Occurrences</p> <ul style="list-style-type: none"> Local transportation agency to contact Police/Sheriff to inform them of excessive queuing near railroad crossing. Continue to monitor for driver behavior and compliance to rules of right-of-way. <p>Response if Greater than 90 minutes Duration</p> <ul style="list-style-type: none"> Local transportation agency to contact railroad representatives to inform them of increased vehicle exposure. Local transportation agency to deploy temporary changeable message boards.

APPENDIX

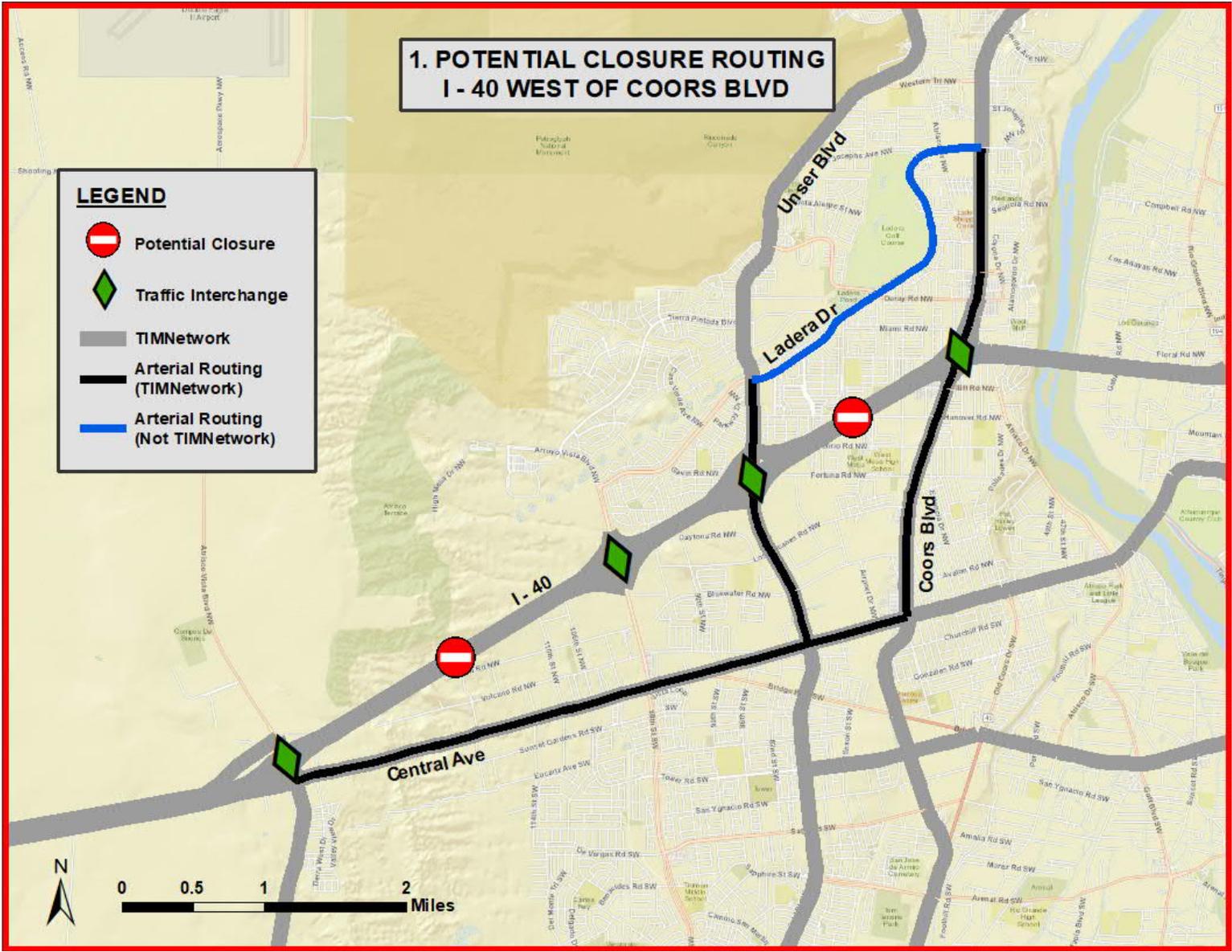
A.3. TIM DIVERSION ROUTES

The following maps are provided to identify roadways that may be adversely impacted during extended closures. These maps illustrate potential diversion routes that drivers may choose to take during key closures along I-25, I-40, and across the Rio Grande. Each map illustrates logical diversion routes based on the roadway network, roadway classifications, and travel patterns. Reference is also made to a draft AMPA “TIM Network” that was previously developed by AMPA member agencies. These routes are not anticipated to be advertised to the traveling public but are provided for operating agencies to evaluate in anticipation of a potential closure.

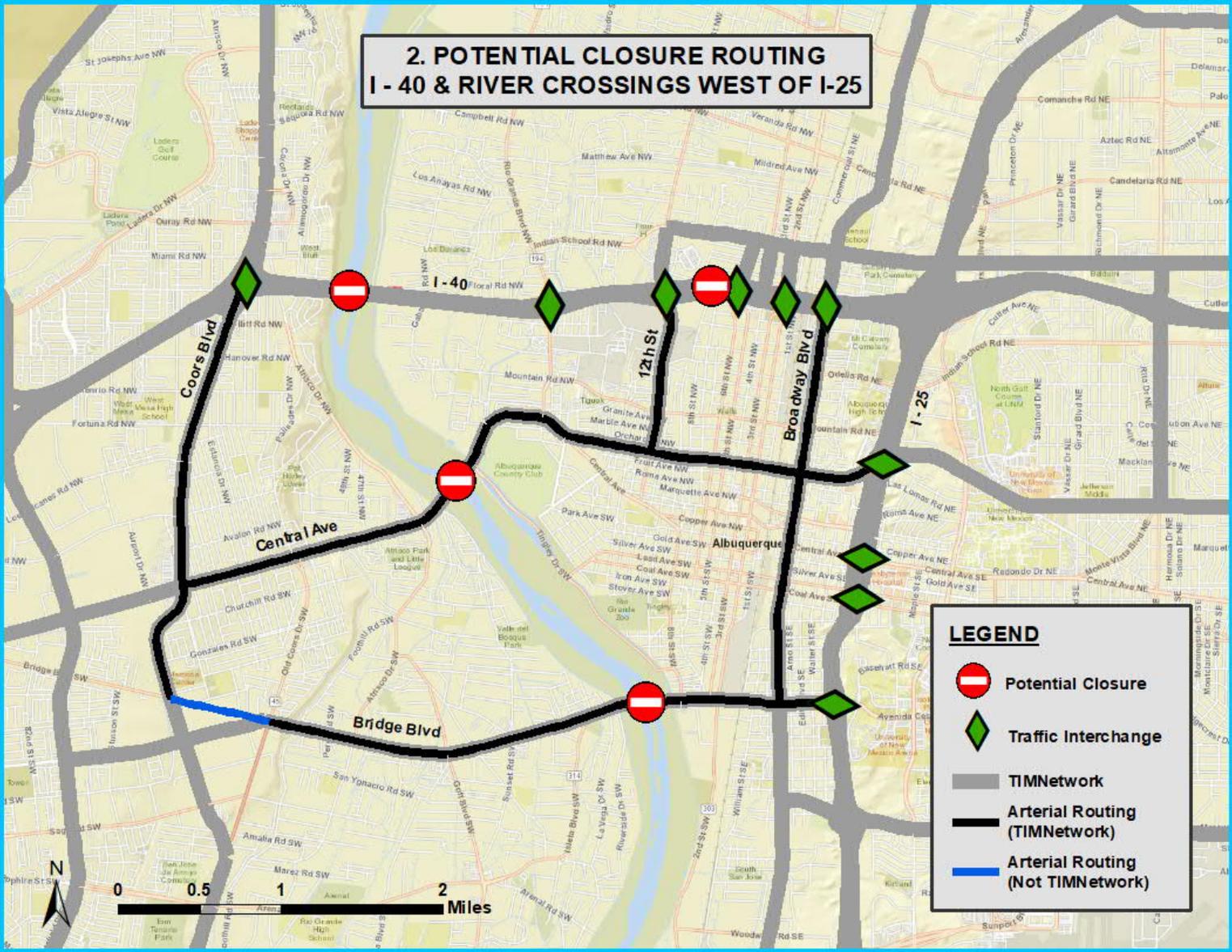
1. POTENTIAL CLOSURE ROUTING I - 40 WEST OF COORS BLVD

LEGEND

-  Potential Closure
-  Traffic Interchange
-  TIMNetwork
-  Arterial Routing (TIMNetwork)
-  Arterial Routing (Not TIMNetwork)



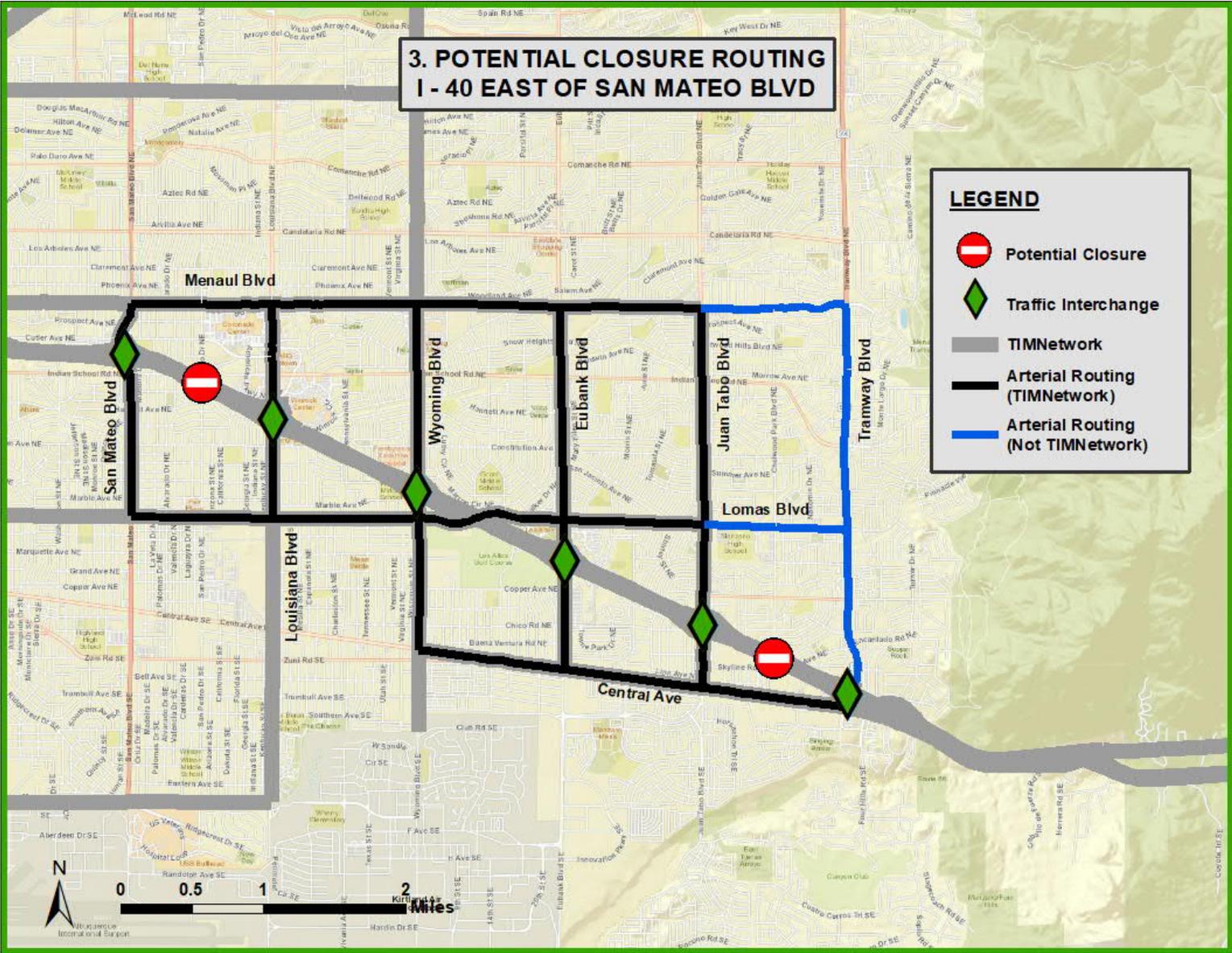
2. POTENTIAL CLOSURE ROUTING I - 40 & RIVER CROSSINGS WEST OF I-25



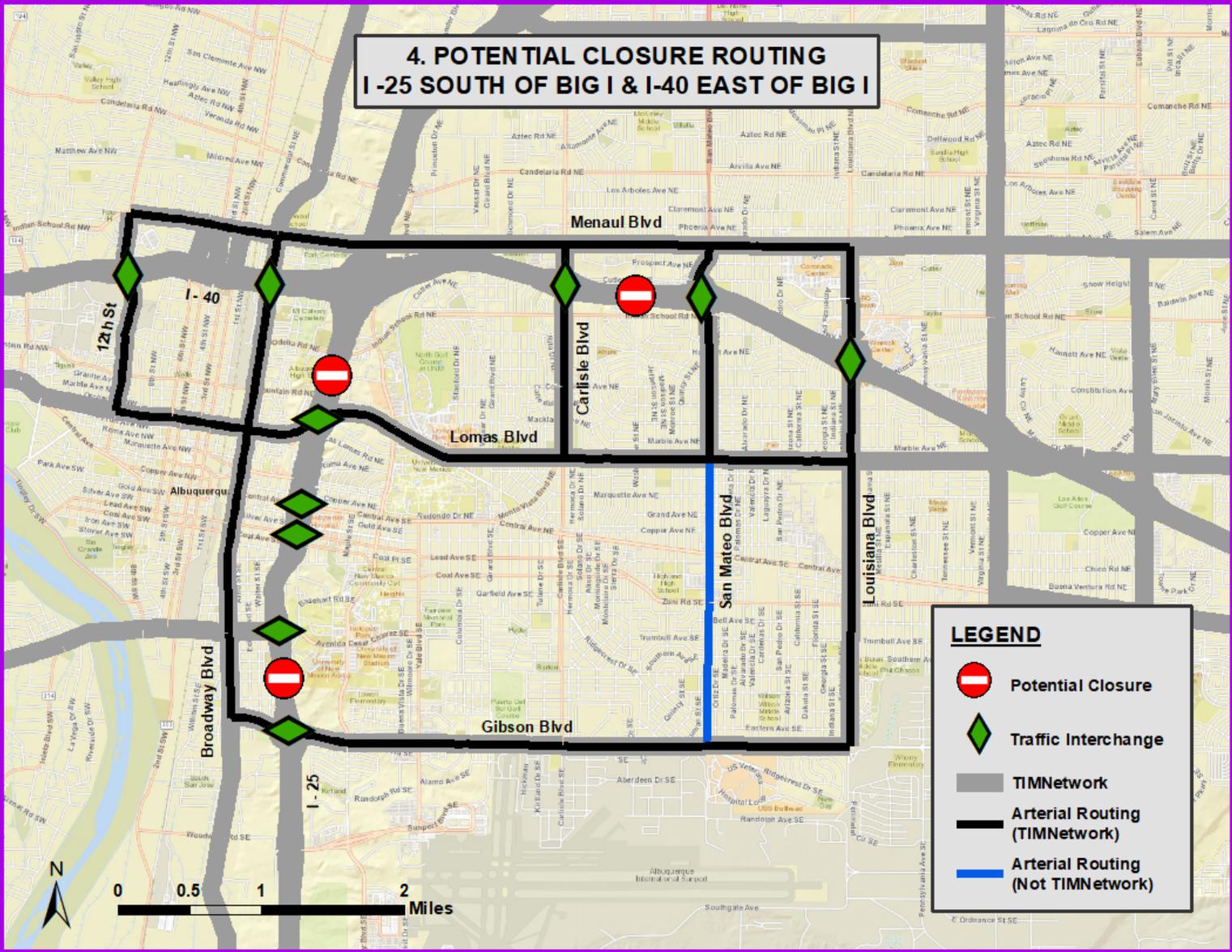
3. POTENTIAL CLOSURE ROUTING I - 40 EAST OF SAN MATEO BLVD

LEGEND

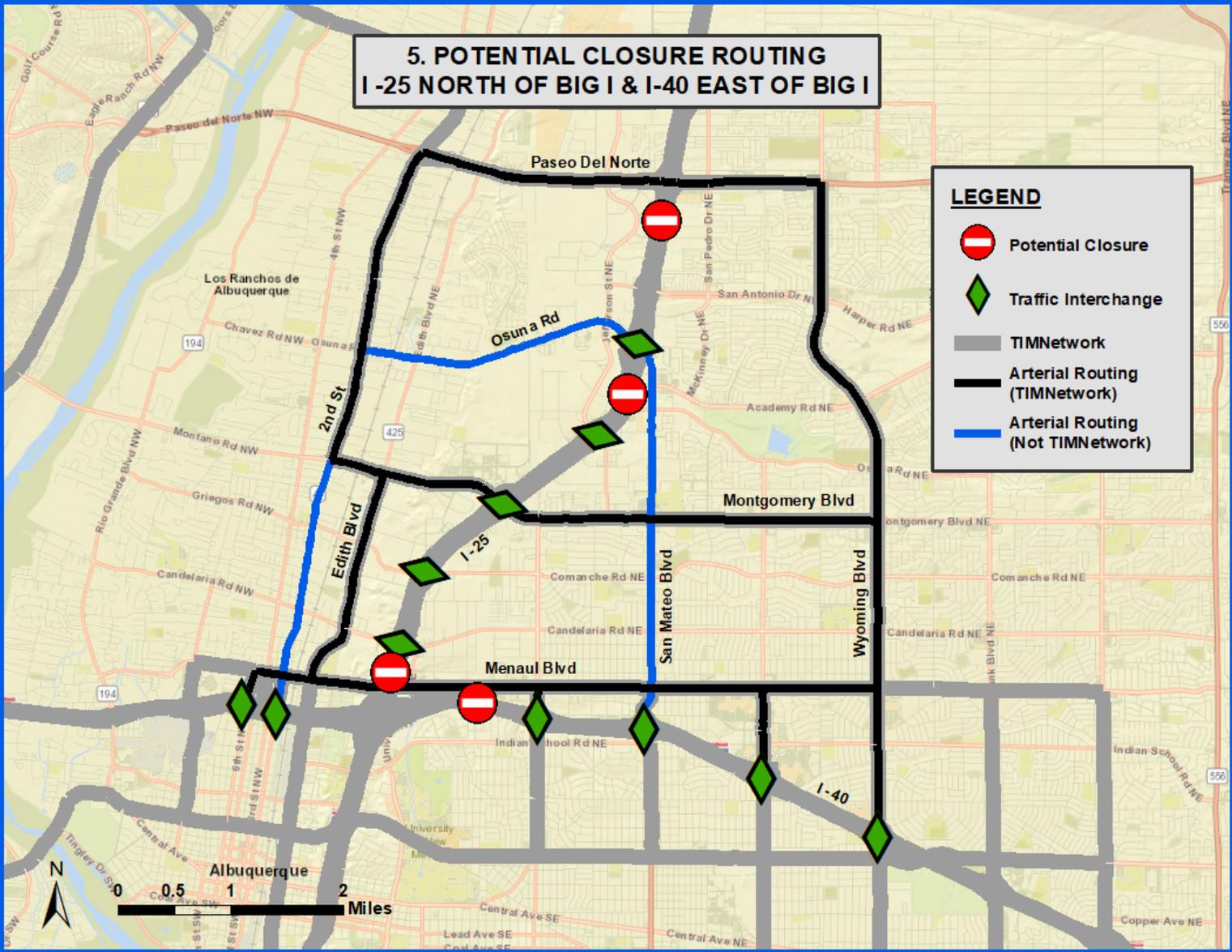
-  Potential Closure
-  Traffic Interchange
-  TIMNetwork
-  Arterial Routing (TIMNetwork)
-  Arterial Routing (Not TIMNetwork)



4. POTENTIAL CLOSURE ROUTING I-25 SOUTH OF BIG I & I-40 EAST OF BIG I



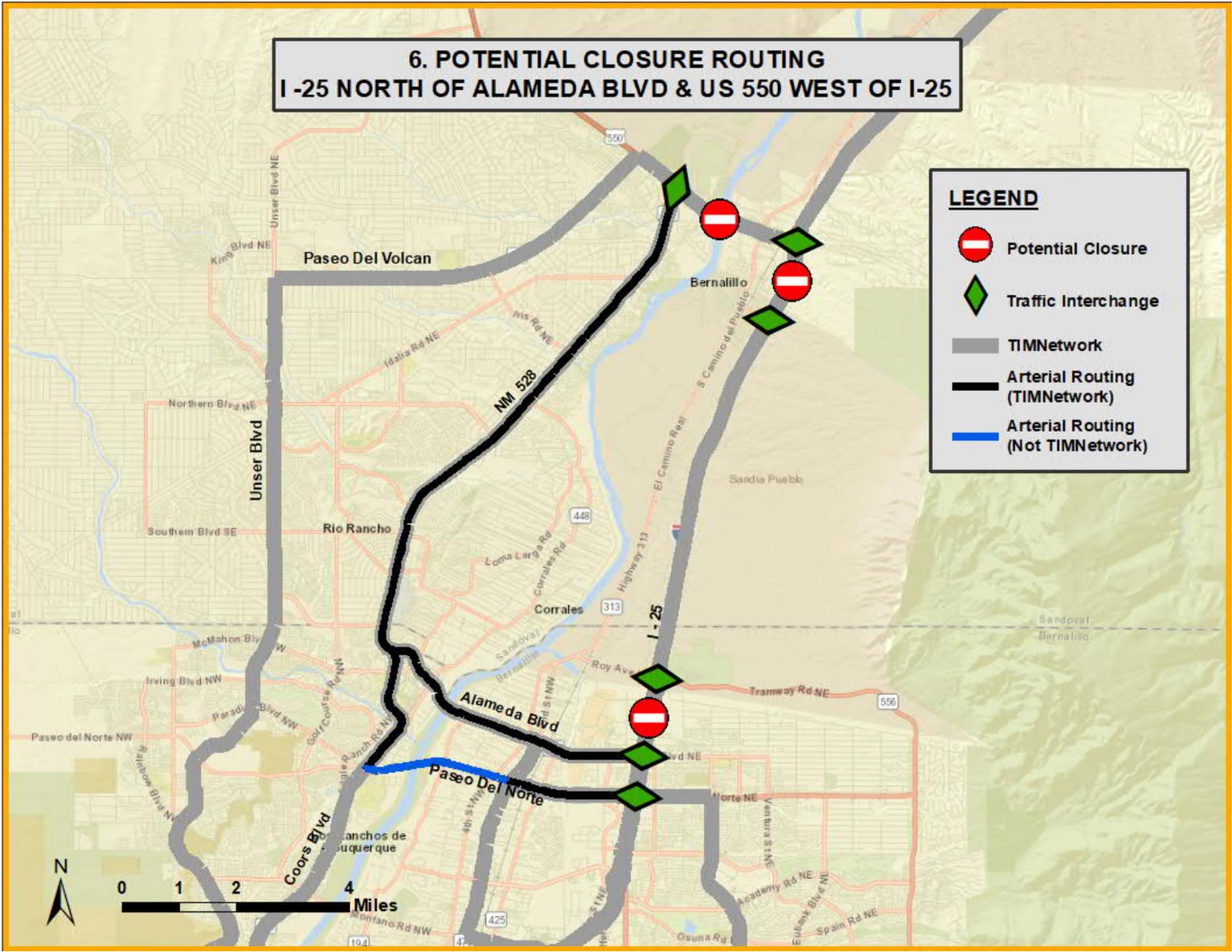
**5. POTENTIAL CLOSURE ROUTING
I-25 NORTH OF BIG I & I-40 EAST OF BIG I**



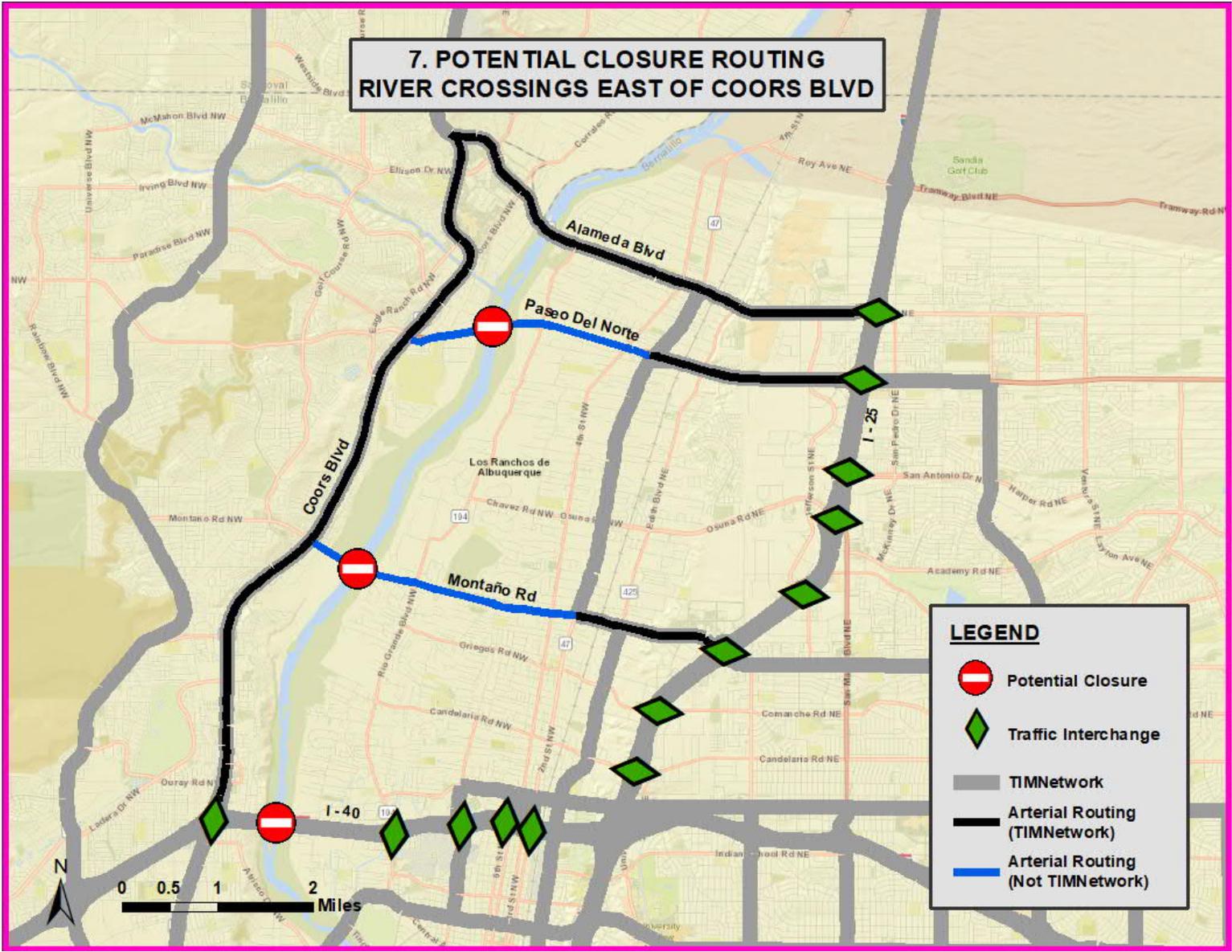
**6. POTENTIAL CLOSURE ROUTING
I-25 NORTH OF ALAMEDA BLVD & US 550 WEST OF I-25**

LEGEND

-  Potential Closure
-  Traffic Interchange
-  TIMNetwork
-  Arterial Routing (TIMNetwork)
-  Arterial Routing (Not TIMNetwork)



7. POTENTIAL CLOSURE ROUTING RIVER CROSSINGS EAST OF COORS BLVD



LEGEND

-  Potential Closure
-  Traffic Interchange
-  TIMNetwork
-  Arterial Routing (TIMNetwork)
-  Arterial Routing (Not TIMNetwork)

8. POTENTIAL CLOSURE ROUTING RIVER CROSSINGS AT RIO BRAVO BLVD & I-25

