

Deliverable for:

Albuquerque Area Joint Transportation Management Center

Concept of Operations

Submitted to:

New Mexico Department of Transportation

Submitted by:

ICx Transportation Group, Inc.



June 5, 2012

Revision History

Rev. #	Date	Author	QC	Notes (General Nature of Changes and Affected Pages)
V 1.0	5/2/11	EPJ	EAE, MAB	First Draft Submittal
V 1.1	5/18/11	MAB	PD	Revised based on comments from NMDOT

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Appendix A - Stakeholders contacted during development of Concept of Operations

List of Acronyms

AFCR	Armed Forces Reserve Center
AMPA	Albuquerque Metropolitan Planning Area
AVL	Automatic Vehicle Location
APD	Albuquerque Police Department
BCSO	Bernalillo County Sherriff's Office
Bernco	Bernalillo County
CCTV	Closed Circuit Television
CM	Construction Manager
COA	City of Albuquerque
ConOps	Concept of Operations
CORR	City of Rio Rancho
D3	NMDOT District Three
D5	NMDOT District Five
DMS	Dynamic Message Signs
DOT	Department of Transportation
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GMP	Guaranteed Maximum Price
HELP	Highway Emergency Lending Patrol
IBC	International Building Code
ITE	Institute of Traffic Engineers
ITS	Intelligent Transportation Systems
JTMC	Joint Transportation Management Center
LEED	Leadership in Energy and Environmental Design

MOA	Memorandum of Agreement
MPO	Metropolitan Planning Organization
MRCOG	Mid-Region Council of Governments
NMDOT	New Mexico Department of Transportation
NMSP	New Mexico State Police
NWS	National Weather Service
OEM	Office of Emergency Management
PIO	Public Information Officer
SOP	Standard Operating Procedure
STMC	New Jersey Statewide Traffic Management Center
TMC	Transportation Management Center
TTY	Text Telephone
UNM	University of New Mexico

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This document presents the Albuquerque Area Joint Transportation Management Center (JTMC) Concept of Operations (ConOps). The JTMC is being planned to support multi-agency coordination and joint operations to improve traffic management in the greater Albuquerque area.

This ConOps is intended to describe the project purpose and need, identify the key goals of the JTMC, and to document the high-level functional requirements of the project. The overall project design, implementation and operations will be guided by the high-level functional requirements.

1.1 The Albuquerque Metropolitan Planning Area

The Mid-Region Council of Governments (MRCOG) is the metropolitan planning organization (MPO) for the Albuquerque Metropolitan Planning Area (AMPA). The AMPA region is shown in Figure 1, and generally defines the region from where potential participants in the JTMC will be drawn. The boundary is not a hard or mandated boundary, and participation can come from partners outside AMPA. It should also be noted that the New Mexico Department of Transportation (NMDOT) Intelligent Transportation Systems (ITS) Bureau is a statewide operation, including the Albuquerque area.

Albuquerque is the largest city in the state of New Mexico. It is located in Bernalillo County and is situated in the central part of the state. The city population is over 540,000. Albuquerque is the 34th-largest city in the United States. Roughly half the people in New Mexico live in the Albuquerque area. Albuquerque is home to the University of New Mexico (UNM), Kirtland Air Force Base and Sandia National Laboratories.

The AMPA population is greater than 880,000. The metropolitan area includes the city of Rio Rancho, one of the fastest-growing cities in the United States.

The Rio Grande runs through the area, and there are several city, county and state bridges crossing the river. These bridges are a major choke point in the area and require constant monitoring. The impacts of the limited river crossings are exacerbated during incidents. The area typically has mild weather, but on a few occasions a year the area comes to a stop due to snow. The southern part of the state also suffers from dust storms, which, if large enough, can have an effect in Albuquerque.

1.2 Background

The material in this document was gathered during two stakeholder meetings and individual interviews of potential JTMC participating agencies conducted in early 2011. This was the first opportunity for the stakeholders to meet and discuss the potential JTMC, and how they might participate. This ConOps should be considered as a starting point, and should be refined as the project progresses to add detail, change assumptions, and achieve consensus on the overall JTMC purpose and function.

A parallel effort was conducted on behalf of the JTMC Stakeholder Group by the ICx team to assess the feasibility of using an existing facility to house the JTMC. This ConOps guided

the preliminary space planning and feasibility assessment of, and should continue to be used (as it is refined) for future iterations of the JTMC space plan.

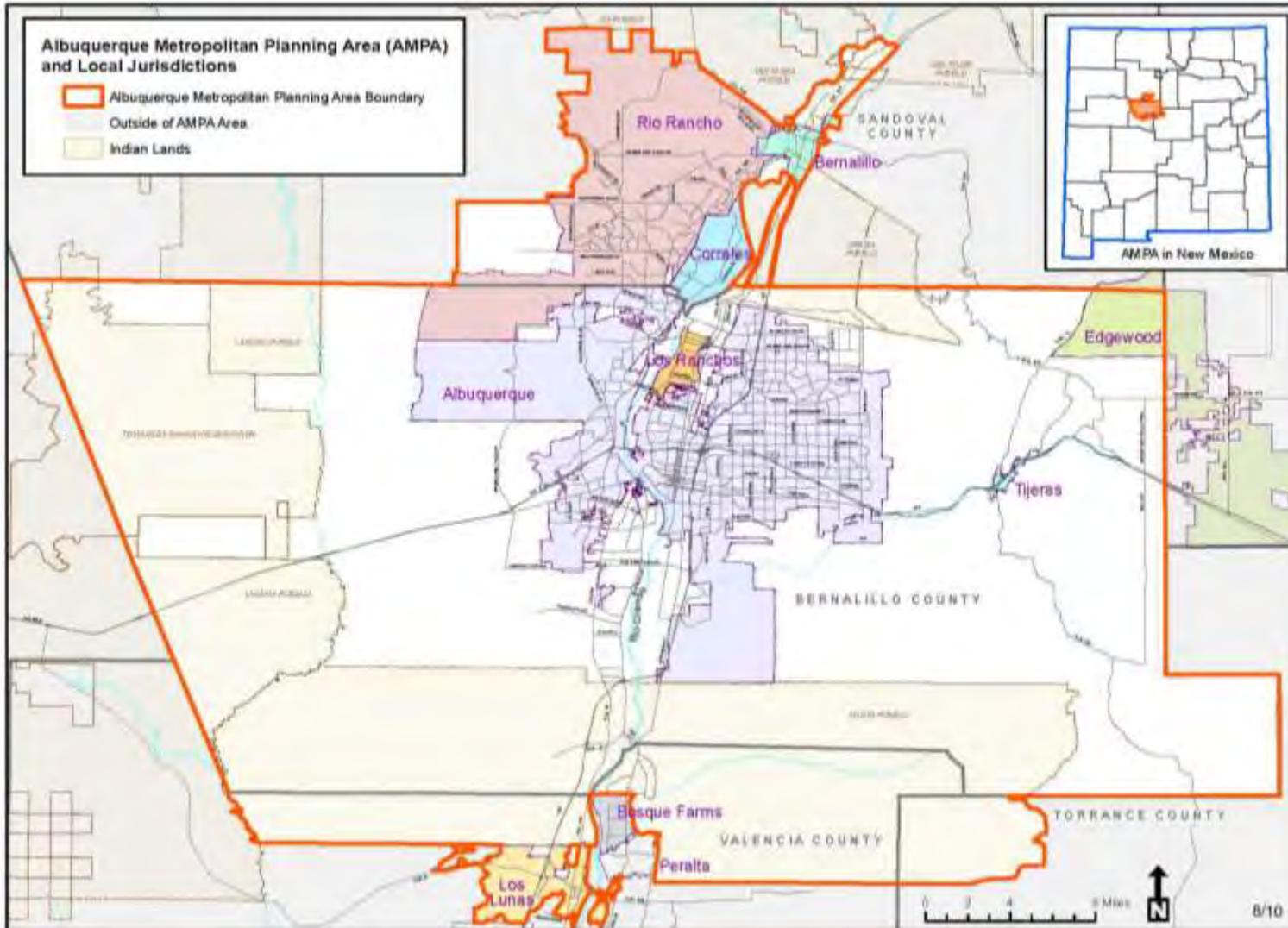


Figure 1: AMPA Region

A list of stakeholders contacted during the course of developing this ConOps is provided in Appendix A.

This ConOps provides an operational, high-level description of how the JTMC could improve transportation operations and management in the metropolitan area. This document identifies the functionality of the JTMC, the major participants, and describes how the JTMC could benefit overall operations.

2 ~~Planning~~

Traffic congestion is primarily related to peak period travel, incidents and events in the greater Albuquerque area is a persistent issue. Traffic bottlenecks at river and freeway crossings are a primary constraint. The transportation network in the region is managed by state, county and city agencies. These agencies currently do their best to work together to better manage traffic at cross-jurisdictional boundaries. However, staff and budgets at the agencies are all very constrained, and the amount of resources available to address these issues is very limited.

During major incidents and events, police and other emergency responders actively participate in traffic management. Based on the input from the stakeholders, there is a need to improve joint agency operations during such incidents and events. Weather-related events are a key concern, as these can affect the entire region, can last many days, and are a focus of public opinion regarding the stakeholders' efficacy. Current operations are characterized by a lack of mutually developed and agreed upon interagency procedures/protocols for response. While each agency is pursuing its **department's** mission and goals that support traffic operations and safety in the region, they are not well coordinated. Last, information exchange between agencies, and ultimately to the public, is constrained by this lack of coordination.

Key characteristics of current multi-agency communications during traffic-related incidents and events are:

- Information is provided when requested. If someone wants information, they call and **ask for it. However, information is not "pushed" to others. For example, road closures by police** are not regularly or immediately communicated to the transportation operations agencies. The transportation agencies must initiate a request for such information, if they detect issues on their network from public phone calls, automated detection in the road, or by viewing camera images.
- Although there are ad-hoc processes and procedures in place for multi-agency traffic incident response or weather event response, there are no formal procedures and no commitment from each agency to follow any particular protocol. Processes and procedures are unwritten, informal, and reside in each individual participant's knowledge base. Information is requested from personnel who know one another, and where trust and understanding are in place. If a particular individual is not available, the information may not be obtained.
- Staff resource constraints are significant and exist among many of the regional stakeholders. The lack of staff limits the ability to monitor and manage the transportation network.

During major winter weather events, it is common for City of Albuquerque and State Police to coordinate their response with NMDOT. Video camera images are available to stakeholder agencies through administrative access over the internet.. By providing a facility that could co-locate key transportation and police agencies, the JTMC can enable improved communications, coordination, and possibly resource sharing among the stakeholders.

The Albuquerque Area JTMC is intended to:

- Improve interagency coordination, including developing and documenting processes, procedures and protocols for consistency in response
- Develop strong partnerships between agencies
- Improve interagency cooperation and understanding of **each other's capabilities, needs** and procedures and resource sharing.
- Enable improved public information about traffic incident response and traffic conditions
- Provide improved situational awareness to emergency responders via use of the City, County and State DOT video images
- Enable integrated corridor management across jurisdictional boundaries
- Enable sharing of transportation operations resources such as Dynamic Message Signs (DMS) and traffic signal control
- Streamline the process of responding to incidents

2.1 National Experience with JTMCs

The proposal to implement the AMPA JTMC to improve operations is based on the experience of JTMCs from across the US. There is a growing trend in urban areas to collocate transportation and emergency response agencies to improve transportation operations. There are at least twenty such joint centers in the US, and the list is growing. Two recently constructed centers are:

- The New Jersey Statewide Traffic Management Center (STMC) is a 24/7 Operations Center jointly operated and staffed by the New Jersey Turnpike Authority, the New Jersey Department of Transportation, and the New Jersey State Police. Co-location affords simple and effective region-wide coordination of traffic incidents and emergencies in an interoperable manner. Each of the agencies manages its own operations from the STMC, but is supported by a technology base that shares information and video across agency boundaries. Using the latest technology, which leverages legacy applications, this center provides accurate and timely information to the motorists.

- The McConnell Public Safety and Transportation Operations Center is located Fairfax County, Virginia. The center houses Department of Public Safety Communications (9-1-1 Communication Center), the Office of Emergency Management, the Emergency Operations Center, the Virginia State Police Division 7 dispatchers and call talkers, and Virginia Department of Transportation Operations Center. Technology and information sharing -particularly video sharing - has improved situational awareness across agencies. In addition, co-location has improved multi-agency coordination and response to traffic incidents.



Figure 2: McConnell JTMC Operations Floor

- The Combined Transportation and Emergency Communications Management Center is located in Austin, Texas. The center houses Texas DOT ITS staff and systems; City of Austin Fire and Police staff; the Austin/Travis County Emergency Operations Center; the region's Computer Aided Dispatch System; and other related



Figure 3: Austin CTEC Operations Floor

This facility handles emergency 911 calls, emergency services dispatching, intelligent transportation systems, public transit management, command and control of daily operations and critical incidents, and related activities.

- **Minnesota's Regional Traffic Management Center**, built in 1972, houses the state DOT's traffic operations staff; maintenance dispatch; the freeway service program; state highway patrol dispatch; ITS maintenance staff; and other related functions.



Figure 4: Minnesota Regional TMC

The experience from these and other JTMCs has been gathered by the Federal Highway Administration (FHWA). Co-location of transportation providers with police dispatch has been shown to increase partnership and coordination for all levels of operations. Indeed, co-location of personnel is the key to improved response. Even though technology can support sharing information between agencies that are not co-located, it is the presence of the staff working together, developing relationships and **understanding of each other's needs that is the major force behind improvements**. In addition, being co-located increases the opportunities for communications and joint planning, and even resource sharing, across like agencies. Specific benefits reported include:

- Improved situational awareness for police, as they are provided access to video images from state and local transportation operations agencies
- Improved coordination through ongoing person-to-person contact
- Greater ability to share resources, including telecommunications networks, data and personnel
- Improved corridor management for cross jurisdictional roadways

Most JTMCs are focused on incident management, and have reported improvements including:

- Florida DOT and Miami Dade County – Reduced Roadway Clearance Time by 11 %
- Florida DOT and Broward County – Reduced Roadway and Incident Clearance Times by 18 % and 4 %, respectively
- Houston Transtar – 2009 estimated cost:benefit ratio of 1:9.9 based on travel time savings from incident management program

3 **MISSION**

In January of 2011 a workshop was held with potential JTMC agencies. They were all polled to gather input on the JTMC mission. A combined draft mission statement was developed based upon their input. This is the proposed Strawman (draft for consideration) Mission Statement:

To improve public safety and quality of life in the Albuquerque region, the JTMC will provide an enabling environment for transportation operations and emergency response agencies to collaborate and share information, systems, and resources to implement a joint, systematic approach to improving normal traffic operations and traffic incident response.

Definitions:

- **Traffic Incident:** A planned or unplanned event that impacts traffic flows significantly. Examples includes crashes, weather events, police or fire responder activities, water main breaks, construction, festivals, and special events.
- **Normal Traffic Operations:** Traffic systems operations in response to typical hourly, daily, and seasonal fluctuations in traffic demand.

Goals for the JTMC have not yet been fully developed with the stakeholders but it goes without saying that they should address how the Mission of the JTMC can be accomplished. This effort of defining the goals should be done as the project proceeds. Based on stakeholder input and other US joint center goals, the following draft list is provided for consideration:

- Provide more timely and detailed information to the public regarding traffic conditions, traffic incidents, and traffic related to special events, including information on freeways and surface streets.
- Develop and implement procedures for sharing and managing transportation operations assets including traffic signals, DMS, video cameras, and detection.
- Develop and implement protocols and procedures to improve multi-agency response to traffic incidents and weather events.
- Develop and implement multi-agency protocols and procedures to plan for, respond to, and improve event traffic operations.
- Develop and implement multi-agency protocols and procedures for after-action review of major traffic incidents for the purpose of improving coordination and response.
- Develop and implement procedures for automated information and data sharing and fusion to provide improved region-wide understanding of traffic conditions.

These goals may change as the TMC is developed and then operated.

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The JTMC will function in three different modes: normal operations, unplanned incidents and planned events. These modes are not mutually exclusive, such as when an unplanned incident occurs during a planned event. In addition, there are varying levels of incidents and events, based on their time and geographic impact. For the purpose of this ConOps, the three primary modes are discussed individually, based on how operations occur today, and anticipated changes with the JTMC. The section begins with a description of ITS infrastructure in place in the AMPA region, including staffing at the transportation operations agencies, to establish context and capabilities.

4.1 Overview of Existing and Programmed Key ITS Infrastructure and Staffing

The region's transportation operations partners share, or are working to share, some significant resources that support normal operations. The following provides an overview of key ITS infrastructure that supports coordinated/joint operations. Because ITS technologies are ineffective without adequate staffing, a summary of the current operations staffing by the key partners is provided.

- **Video Camera Images and Shared Control.**

NMDOT's website, NMRoads.com, provides NMDOT Closed Circuit Television (CCTV) camera images to any user via the internet. NMDOT has deployed approximately 58 CCTV in the area. Currently, the New Mexico State Police (NMSP) D5 Dispatch accesses the video images through administrator access to NMRoads when needed to support their operations. NMDOT and City of Albuquerque (COA) Traffic are currently discussing how and whether to implement a system that would enable each **agency to control the other's cameras**. Any such system would likely be implemented in the web environment via NMRoads. The COA has deployed approximately 75 CCTV. Bernalillo County also has some cameras, but they are on dial-up, and it is questionable whether they are operable at this point.

- **Dynamic Message Signs**

NMDOT and the COA both have dynamic message signs installed on their facilities (NMDOT has deployed approximately 40 DMS, and COA approximately 11). This total could grow to 60 within the next couple of years. The City does not have adequate staff resources to operate these signs and has entered into an MOA with NMDOT to allow NMDOT to control its. Messages are entered by NMDOT operators based on information that they observe on CCTV cameras, or based on information provided by the NMSP. Bernalillo County has no DMS deployed.

- **Communications Network**

The COA and NMDOT have each deployed fairly extensive fiber optic networks within their respective rights-of-way. There is currently an MOA in place between NMDOT, COA, and Bernco to share these resources.

- **Traffic Signal Operations and Monitoring Systems**

The COA, Bernalillo County (Bernco), and NMDOT (along with the City of Rio Rancho, the City of Belen, and the Village of Los Lunas) all own and maintain traffic signals. COA operates its own signals as well as **NMDOT traffic signals within the COA's borders**. NMDOT traffic signals in the Town of Bernalillo and Village of Los Ranchos (US 550 and 4th Street, respectively) and the Village of Los Lunas and City of Belen (NM 6 and NM 47) are operated by NMDOT.

The agencies are not able to coordinate operations effectively across borders, largely due to a lack of telecommunications infrastructure that would enable such coordinated operations. However, projects are currently programmed to implement telecommunications to support cross-jurisdictional traffic signal coordination on Paseo del Norte and Alameda between the COA and Bernco. In addition, the region is moving towards adopting a uniform central control platform, which would also simplify cross-jurisdictional traffic signal coordination.

- **Transportation Operations Agencies - Staffing**

The COA has three staff members responsible for traffic signal, CCTV and DMS operations, in addition to their other traffic engineering duties. The current staffing level is insufficient for the existing workload. Based on Institute of Traffic Engineers (ITE) guidelines, staff is at approximately 25% of the desired level. Because the staff is so thin, no one is assigned directly to monitoring arterial traffic operations. The City is assessing an agreement to enable NMDOT to operate its arterial DMS. Traffic staff are available from 8:00 AM to 5:00 PM on normal work days.

The Traffic Engineer at Bernco is responsible for traffic signal timing, among the other traffic operations and engineering duties assigned to that position. Traffic signals and CCTV cameras are on a dial-up system, so constant monitoring is not possible. The system is located in an office that is not staffed. The Traffic Engineer does dial into the systems to check operations daily, or as needed if a malfunction is reported. The CCTVs are used to confirm conditions that are reported, and to support traffic signal timing plan changes. The Traffic Engineer is available from 8:00 AM to 5:00 PM on normal work days.

The NMDOT Intelligent Transportation Systems Operations oversees the Traffic Management Center. The minimum operator position staffing is 4, but there are times when 5 staff present. The operators work on a staggered schedule: there are some times when there is only one operator present, while at other times there are five working. The TMC is staffed 6AM – 10PM on weekdays, and 7AM – 8PM on weekends.

The NMDOT TMC staff are responsible for monitoring and operating the systems on the state-managed roads statewide, with the majority of systems installed on the interstates in the AMPA region. The operators at the TMC dispatch the Highway Emergency Lending Patrol (HELP) courtesy patrol vehicles in the AMPA region, monitor traffic conditions using CCTV images and a congestion map, monitor the National Weather Service (NWS) forecasts, and monitor and support the management of incidents on NMDOT facilities, including

inputting information for broadcast to the public via DMS, the web, and phone 511.
NMDOT's staffing level is adequate to support their current operations.

4.2 Normal Operations

Normal Operations does not mean there is no congestion or operations activity. Normal Operations includes typical daily and seasonal congestion, minor closures and detours due to construction or street maintenance, and traffic signal malfunctions and outages. Normal Operations also include the day-to-day activities that are required to monitor and maintain the traffic network in the metropolitan area.

4.2.1 Normal Operations Today

Normal operations are usually carried out by each partner independent of the others. There are no systems to inform each other of typical congestion changes or other typical normal operations conditions.

The agencies are working to improve coordination of traffic signal operations across jurisdictional boundaries. There is a project programmed to install needed communications on two major arterials so that the COA and Bernco traffic signal systems can be coordinated across the jurisdictional boundary. In addition, the State, COA, Bernco and Rio Rancho are working on programming a project to procure the same traffic signal operations software platform, which should greatly improve their ability to operate traffic signals seamlessly across jurisdictional boundaries.

4.2.1.1 Normal Operations – Identified Needs

The following provides a list of the most important needs to support normal operations today:

- Staffing to Monitor Arterial Operations. Today, there are no staff assigned to regularly monitor arterial operations in the AMPA region. This is because it is not a major need for the agencies with a relatively small number of traffic signals, and because the staffing levels at COA are inadequate to support current operations needs.
- Traffic Signal Coordination Across Jurisdictional Boundaries. As noted above, COA and Bernco are discussing implementing communications linkages and common software to improve traffic signal operations across jurisdictional boundaries. Once these are in place, the agencies would have to next agree upon traffic signal timing parameters, and operational responsibilities.
- Normal Operations Standard Operating Procedures (SOPs). There are no guidelines or SOPs in place that define when communications should be initiated among the stakeholders to advise when there are issues or changes to normal operations that should be monitored. It would be difficult for the partners to develop such guidance or SOPs today, since **“normal regional” operations haven't been yet defined among the stakeholders and**, as a result, there is no established definition of departures from normal regional operations.

4.2.2 Normal Operations With the JTMC

The key benefit of the JTMC for normal operations is the ability to leverage the presence of the various **agencies'** staff. With the JTMC in place, it would be possible to:

- Improve Overall System Monitoring. For example, a real-time display of traffic signals from any or all of the agencies in the AMPA region, highlighting outages or malfunctions, could be provided. Staff assigned to other operational duties could be asked to regularly check this display and report any concerns to the affected agency. In addition, if there are any malfunctions or outages, the staff would understand the source of any nearby congestion, and would not need to spend time trying to assess the cause.
- Understand When Normal Operations Should Be Communicated to All Partners. With the agencies located under the same roof, and with the shared monitoring capabilities that would be present at the JTMC, the partners would have a better understanding of exactly what constitutes normal operations, and when any changes in conditions should be communicated to others. Guidance or SOPs could then be developed.

Probably the greatest benefit would come from the co-location of staff from the various agencies. This allows them **to coordinate together "on the fly"**. **Being located together enables** face-to-face communication on a nearly continual basis.

4.3 Unplanned incidents

For purposes of this ConOps, Unplanned Incidents will be categorized as either weather events or other incidents that result in major traffic congestion.

4.3.1 Unplanned Incident Operations Today

Today, the major characteristics of joint or coordinated operations during unplanned incidents are:

- Data is "pulled" if needed, and only sometimes "pushed" – agencies do not share data with others as a matter of course. If one partner is working to manage an unplanned incident, they will contact others as they see fit to gather more information or to request **support. Two examples of how data is "pulled" are:**
 - NMDOT's **TMC** monitors police bands to listen for unplanned incidents.
 - If police responders wish to understand the larger picture regarding traffic incident's impact, they will call the NMDOT and request an assessment from the NMDOT operators.
- There are no shared Standard Operating Procedures in place for responding to unplanned incidents. Overall, there is coordination among the partners when unplanned incidents occur, with each demonstrating a commitment to public safety. However, the response is based on individual agency procedures, and the staff understanding and **knowledge of each other's operations**. The response becomes greatly dependent upon the past experience and knowledge of the key individuals involved in the incident, as

well as personal relationships among the responders. There are no guidelines regarding when coordination should take place.

In general, the response to most unplanned incidents with moderate impact is satisfactory. On NMDOT roads with detection and surveillance, public information is effectively provided via NMRoads, DMS and other channels. Today, the same level of public information is not provided on COA, Bernco or other arterials, because of the staffing deficit noted above.

With respect to major closures or multiple incidents, coordination can break down simply because there is no means to share information between multiple responders. The result is a response that is less efficient and effective than it could be, and the ability to communicate accurate information to the public is made more difficult.

The following provides additional detail about how incidents that occur on NMDOT-managed facilities are handled:

Incident Detection and Confirmation – Typically, the first notification of a major incident is a call into 911 from a cell phone by motorists or the public. NMDOT TMC gets informed by a phone call or fax teletype from the State Police. NMDOT operators also rely on the camera images, traffic detection, and calls from HELP truck operators to detect incidents. The NMDOT will then call relevant contacts from APD, BCSO, NMSP, or other local agencies as needed.

Incidents detected via NMDOT resources or from police information are considered confirmed. Incidents from other sources are not considered confirmed until a responder arrives at the scene. Information from the public is not considered reliable enough to confirm an incident.

Response – Dispatchers need to know what is happening at the incident scene in order to **allocate resources to the site. This information must come from “boots on the ground”, i.e.** from a law enforcement responder, or the Courtesy Patrol.

If freeway closures are required, there are different police approaches based on the expected closure duration. Short-term closures (10 to 30 minutes) are done using police vehicles to block the mainline. Ramps are not closed. For longer-term incidents, police set a perimeter with police cars to close access to the freeway and to re-direct traffic. If an incident is expected to last longer than several hours, police will call for barricades to be set up to close ramps so that they can free up some of their officers. In most cases, the barricades are provided by traffic control contractors. There are, however five locations with ramp gates (four on East I-40 and one on West I-40), **but they aren't automatically or remotely actuated.** Barricades come from public works department for municipal intersections

NMDOT will dispatch HELP trucks, and inform the public by posting the incident on DMS, on the NMRoads website, and the 511 phone system.

As a cost-cutting measure, the NMSP will no longer be patrolling from 3 AM to 6 AM. This could impact incident response time.

Media Notifications - Incident information is distributed to the media by way of NMDOT and NMSP Dispatch Public Information Officers (PIOs). The media will go to whatever sources are

available for information; they go down their checklist of phone contacts. Providing timely and accurate information to the media is extremely important to keep the public informed. In addition, media may go to a scene themselves if they are not provided with information, and this can cause complications in ensuring a consistent message is provided to the public. The partners understand the importance of keeping the public and media informed.

4.3.2 Weather Events Today

Winter weather response is a significant concern for each involved agency. Because weather events are somewhat unpredictable, can be widespread, and last several days, they tax already thin staffing resources. In addition, weather events are of major concern to the public. Each agency monitors weather forecasts provided by the NWS.

Today, weather event operations are characterized no differently from other incidents, in that the agencies typically operate fairly independently, with some ad hoc coordination that is based on individual experience and knowledge. Each agency is operating with limited staff resources.

Each year, before winter, leadership and management staff from the regional agencies meet to coordinate and plan for **winter weather response. Key topics include the past year's experience, and briefings on the current year's capabilities and procedures for winter weather response.** A laminated card with the key contacts from each department is supplied to each participant to support winter weather coordination.

The key winter weather responders and their current operational approaches are:

NMDOT D3 Maintenance

- D3 Maintenance is responsible for snow and ice fighting on state-maintained roads. D3 has five normal maintenance patrols in place, with two located within the City of Albuquerque. During District-wide snow and ice events, they can deploy up to 30 trucks around the clock. Ten trucks will work NMDOT facilities within the City of Albuquerque, eight will be deployed in the I-40 Canyon, and the remainder will be dispersed throughout the District. Note that D5 also deploys up to three plows on I-40 in Santa Fe County. The District has established a priority in addressing snow and ice treatment and removal, with the freeways having top priority. Some of the local agencies would like to discuss adjusting that priority with NMDOT.

Field supervisors coordinate via radio with Santa Fe control and the D3 PIO. The D3 PIO sends the information to the media and posts it on the NMRoads.com. If the TMC needs information, they must contact the field supervisors – the field supervisors do not contact the TMC. Because maintenance staff are so busy, they cannot be expected to maintain constant voice contact with the TMC.

Coordination with D5 is important because weather events that occur first in D5 can cause freeway closures that impact traffic in the Albuquerque area. In addition, the two Districts sometimes support each other, depending on where issues occur. Coordination is via phone with the D3 Assistant District Engineer for Maintenance.

NMDOT D3 Maintenance is not informed when police shut down roadways. They would like police to call the District Area Maintenance Supervisors (AMS) Supervisor before they close roads. This issue in particular requires additional coordination. During weather events, D3 Maintenance will typically apply salt and cinders on the roads. This treatment, however, is only effective if traffic passes over the treated areas. If the NMSP **have closed the highway, then the salt and cinders won't work, and maintenance staff** will have wasted its time and resources.

NMDOT ITS

- If a weather event is on the horizon that looks as if it will cause traffic impacts, NMDOT ITS Bureau reallocates staff from the normal 6 AM to 11 PM shift to provide 24/7 coverage.

NMDOT TMC operators will monitor the surveillance cameras and other detection. The NMDOT TMC works with District PIOs to give information to the public, in addition to posting messages to DMS. The TMC operators ensure the 511 web site is continuously updated, including with information from the other Districts (the NMDOT TMC has a statewide responsibility). TMC Operators monitor Albuquerque Police Department (APD) and **Bernalillo County Sherriff's Office (BCSO)** frequencies during weather events to keep on top of conditions and closures. The TMC staff also confirm and investigate the end of any situations as well.

During weather events, it is common for calls to come in from APD and NMSP to check on conditions or discuss conditions and concerns. NMDOT TMC staff have a call list of key police and traffic operations staff. They may contact these staff if they require additional information. However, all personnel are busy during events, and local agency staff (COA and Bernco traffic operations staff) are not always placed on 24/7 shifts, so often times the staff are not readily available. The police (NMSP, BCSO or APD) **can access the same camera images to help them manage events. TMC operators dispatch HELP trucks to support police in managing weather events.**

City of Albuquerque Police

- During weather events, APD shifts their patrol tactics from enforcement to response. They commonly pre-position patrol vehicles in anticipation of needed closures. Many police are directing traffic. In addition to their responsibilities on City roads, the APD supports NMSP for closure of state roads.

Within APD's jurisdiction, if they deem road conditions are too hazardous to allow for driving, they will close roadways and highways. APD noted that there is a lack of coordination on closures between police agencies, and between police and the NMDOT, especially at locations that are in the immediate vicinity of jurisdictional boundaries. They acknowledge that staff resources being very limited is a contributing factor to this. There have been incidents when the NMSP could not be reached at all. The APD sergeants do attempt to phone the TMC to provide information on State Roads, but this is not a top priority, as they are working crashes, closures and traffic control, and other calls.

When there are closures, the APD will close the available ramp gates. Access to the keys to the gates has been an issue. Police will cut the chains with bolt cutters if keys cannot be located in a timely fashion. There has been an MOA prepared to provide APD with keys, but it is held up in legal review.

City of Rio Rancho Police

- City of Rio Rancho Police – The City of Rio Rancho (CORR) police operate in a similar fashion to APD during weather events. They noted that they are not contacted when state, county or COA roads are closed. Road closures outside of CORR can result in traffic tie ups, and people being stranded. It was also noted that if a road is closed in Rio Rancho, they do not notify others. It is common for NMSP D5 dispatch to contact Rio Rancho police dispatch to inquire if a road has been closed.

Within CORR, the police coordinate with road crews via the supervisors regarding snow and ice treatment/removal. CORR added that the City may treat State Roads if the State has not been able to reach them.

ABQ Ride

- ABQ Ride, the City of Albuquerque's **transit provider**, operates independently during weather events. If a freeze or snow is predicted, the road supervisors check their routes about one hour in advance of a shift. They sometimes coordinate with NMDOT D3 Maintenance, especially regarding conditions on Tramway Boulevard, and points east, with their biggest concerns related to areas east of Eubank Boulevard.

Transit snow operations involve short turn-arounds (i.e., terminating the route sooner than is planned for during ordinary options) for coaches. Also during snow operations, the Public Information Officer for the Transit agency contacts media, the Director, and posts information on route changes on the Transit Agency web site.

NMSP

- NMSP D5 (dispatch and patrol) – The State Police contact APD for support when they must shut down freeways and other State Roads (and they ask for support when reopening freeways). They also rely on HELP trucks dispatched by the TMC. The NMSP also works with BCSO as needed to coordinate.

BSCO Dispatch:

- BCSO Dispatch - During any incident-based road closure, BCSO Dispatch notifies NMSP D5 dispatch via Text Telephone (TTY), and is also supposed to contact the TMC.
- Other Local Agency Traffic Operations Response - Weather event response from COA, Bernco, Rio Rancho and other local agency arterial operations staff is focused on ensuring traffic signals are operating during the event, and is focused on traffic signal maintenance crews. Wind events have a much greater impact than snow on COA traffic operations, as traffic signal heads get turned and must be repositioned.

COA noted that its main issue is the lack of staff resources. There are no staff available between 11 PM and 7 AM. Its ability to staff their TMC is very limited, and other needs may take precedence. Similarly, Bernco and City of Rio Rancho do not staff for traffic operations monitoring full time. Rather, they check operations only when they are aware of a traffic signal issue, or when performing retiming.

4.3.2.1 Existing Relevant Technology Resources

There is no Automatic Vehicle Location (AVL) on any maintenance vehicles that provide winter weather response (except HELP trucks), nor are any planned. Radio and cell phone communications are the approach to updates on road conditions.

Radio resources were discussed during the stakeholder workshops. Within the State DOT, there are limited available radio dispatchers. If more than three crews are out in the field, each district is responsible for its own radio dispatch. **If that threshold hasn't been met, State Dispatch** (a division of the Department of Information Technology), provides dispatch service.

APD noted that their radios operate on different frequencies than those of other agencies (NMDOT and NMSP), so field-to-field communications between agencies are made somewhat difficult.

4.3.2.2 Unplanned Incident Operations – Identified Needs

The following key needs were identified to improve response during unplanned incidents:

- Leveraging resources: One area where resources could potentially be leveraged includes staff monitoring of traffic cameras and detection on freeways and arterials. It may also be possible to develop a method to centrally monitor response to incidents and weather events, so a single common operational picture could be developed, rather than having each agency try to create their own view of an incident.
- Coordination and SOPs. As each agency noted, their resources are constrained and recently, have been shrinking even more. The common response when faced with these constraints **is to focus inwardly on their own department's operations** and infrastructure. However, if resources could be leveraged across jurisdictions within the region, all could benefit. Executive buy-in is critical, as operations staff respond first to their own leadership. If agency leadership directs operations staff to focus on cooperative actions, and provides the resources and mandates to do so, it is more likely that coordination will occur.

It was noted that there was no commonly understood threshold for when coordination should be required to take place. As described earlier, the partners usually coordinate when they need information from another agency, but do not commonly supply information before they are asked.

- After action reviews. It was noted that after-action reviews do not involve transportation operations agencies, and that there was no standard threshold for multi-agency after-action reviews. It would be beneficial to create such a standard, and involve all affected

agencies. At this time, NMDOT record the time of incident detection or notification, the time that a HELP truck arrived, and the time that the incident is cleared.

- Performance measures. Performance measures would be useful once the coordination and SOP standards are developed to support continuous improvement in operations. The difficulty will be in developing the SOPs to start with, and then achieving consensus not only on the measures themselves, but how and who will measure and report.

4.3.3 Unplanned Incident Operations With the JTMC

As discussed earlier, co-locating for full-time presence will enable greater understanding and coordination in and of itself. Once the full-time participants are finally selected and come together, they will be able to **learn more about each other's operations and resources, and will** be better able to begin development of SOPs.

The JTMC would include a Situation Room, specifically for the purpose of coordinating before, during and after both planned and unplanned incidents and events. The Situation Room would provide the enabling environment for such coordination. The value of the Situation Room will be enhanced due to the full-time presence of key agencies. The difficulty will be in ensuring that the needed participants will come to any meetings or arrive during incidents that require multi-jurisdictional coordination.

Unplanned incident management should be improved with the JTMC, despite that difficulty, in particular because:

- *Monitoring and Notification* – All full-time empowered participants would have immediate notifications of incidents, as they are already present at the JTMC. Situation Room participants would be notified via phone call, text alert or page to come to the situation room. For participants physically unable of getting to the JTMC a video conference link would be established for face to face communications. During a significant weather event is it anticipated that the actual decision makers would be present at the JTMC.
- *Shared Situational Information* – During a major unplanned incident or weather event, the JTMC would provide information gathering and fusing into a unified, shared **situational "picture"**. **This would require that operations procedures be modified to add this function to an agency's workload** (likely the NMDOT ITS operators). **Procedures would also be modified for all regional agencies such that they "push" information to the JTMC**, rather than wait for a call. It is understood that there will be instances when agencies cannot push the information, and this can be incorporated into any SOPs.
- *Media and Public Notifications* – The JTMC, given that the shared situational information will be created there, will be able to supply coordinated and unified messages to the public via **each agency's** PIO. The NMDOT NMRoads website will be able to supply enhanced information to the public as well.
- *After-Action Reviews*. The Situation Room would be used for after-action reviews for certain incidents and events to assess what went well, what can be improved and to

update the SOPs. It is also suggested that regular meetings with all Situation Room participants be held to keep building relationships and make improvements.

4.4 Planned Incidents (e.g. Festivals, Major Sporting Events)

Currently there is a special events committee that the agencies participate in. One of the region's largest events is the Balloon Fiesta. NMDOT also has met with staff from UNM and COA to address how to manage traffic from some specific events. There are, however, several smaller events and incidents that occur year-round, as well as major construction closures, that would benefit from advanced planning meetings.

4.4.1 Planned Incident Operations Today

Today, major planned events are coordinated among the partners via planning meetings held before the events. Overall, planned event coordination and operations is satisfactory. Difficulties only arise if operations do not proceed per the plan. For example, events can sometimes have unpredictable surges in traffic either entering or leaving, or other incidents can occur during planned events that affect the planned circulation pattern. Then the same operational approach as in unplanned incidents occurs.

4.4.2 Planned Incident Operations With the JTMC

With the JTMC, any event operations that are outside the bounds of **the agencies' plan** can be managed as unplanned incidents at the JTMC, via the Situation Room.

5 ~~CONCLUSION~~

Based on the workshops and interviews, three levels of participation have been identified for the JTMC: Full-Time, Situation Room, and Automated Information Flow.

5.1 Full-time Participation

To be a candidate for full-time participation at the JTMC, the agency should spend a good deal of its time focused on transportation network performance and management. In general, full-time participants:

- **Are responsible for operating major portions of the area's transportation network**
- Have operations that frequently impact, or are frequently impacted by, transportation network performance
- Rely on cross-jurisdictional coordination for their approach and success
- Have a key role in the development of regional protocols and procedures for transportation or traffic incident management

The agency will provide full-time operational presence at the JTMC based on whatever the agency defines as regular full-time operations at the JTMC. For example, this could include rotating staff from their existing base of operations so the agency continually has a presence at the JTMC.

For the "Phase 1" JTMC, the following agencies have expressed interest in Full-Time Participation:

- NMDOT – D3 Traffic, ITS and HELP
- COA Traffic Operations
- Bernco Traffic Operations
- NMSP D5 Dispatch

The **APD's** Traffic Division is also interested in Full-Time participation, but is unable to commit at this time.

5.2 Situation Room Participation

All Full Time participants will have a space in the Situation Room. Other Situation Room participants should meet the following criteria:

- Have hands-on operational coordination for major events, incidents, and weather operations
- Have a key role in development of regional SOPs related to planned and unplanned incidents

Under Situation Room participation, the agency would send staff to the Situation Room for events and incidents that cause major traffic impact (note that the Situation Room does not replace any Emergency Operations Center (EOCs) or EOC functions).

Any affected partner would be welcome to participate in the Situation Room during incidents. Potential Situation Room participants include:

- NMDOT – D3 Traffic, ITS and HELP
- COA Traffic Operations
- Bernco Traffic Operations
- NMSP D5 Dispatch and Field Command
- NMDOT D3 Maintenance
- APD Police Dispatch
- COA APD Police Traffic Division
- COA APD Police Foothills Command
- Bernalillo County BCSO Combined Dispatch
- **Bernalillo County Sheriff's Office**
- MRCOG Rail Runner
- COA Transit/ABQ Ride
- City of Rio Rancho Department of Public safety
- CORR Traffic Operations

5.3 Automated Information Flow Participation

The intent for the information partners is to have an automated flow of information. This automation could be a two way data flow. It is not anticipated that these partners would have any physical presence at the JTMC. Information partners should:

- Have a need for information from outside their jurisdiction to support their own operations
- Have almost no operational coordination needs
- **Don't need person-to-person** contact to make operational decisions
- Ability to supply data/information on operations within their jurisdiction

Under Automated Information Flow Participation, the agency would (a) receive fused data that improves situational awareness during incidents, (b) supply data for fusion; (c) both receive and supply data. Fused data refers to data from multiple sources about an event that has been vetted and consolidated to provide a complete portrayal of the event, and is subsequently distributed to users and stakeholders. This includes data about infrastructure or activities that could be impacted by the event, or data that could impact the response to the event.

All Full-Time and Situation Room Participants would be considered Automated Information Flow participants. The potential agencies that would solely be Automated Information Flow participants include:

- COA Office of Emergency Management
- COA 311
- City of Rio Rancho Traffic
- COA Street Maintenance
- Sandoval County **Sheriff's** Communications
- Sandoval **County Sheriff's Office**
- Sandia Pueblo Police
- Expo New Mexico
- Isleta Pueblo Police
- Sandia National Laboratory Police
- University of New Mexico Police
- Valencia County **Sherriff's** Office
- Town of Bernalillo Police
- Village of Los Lunas Police Department
- Town of Bernalillo
- Santa Ana Police
- State Office of Emergency Management

6 ~~STAKEHOLDERS~~

The potential stakeholders for Phase 1 JTMC for full-time participation are:

- NMDOT ITS Bureau
- NMDOT D3 Courtesy Patrol (HELP)
- NMDOT D3 Traffic Engineering
- NMSP District 5 Dispatch
- COA Traffic Engineering
- Bernco Traffic Engineering

Each of these agencies currently works from its own facilities. The descriptions below provide an overview of their operational responsibilities.

6.1 NMDOT ITS Bureau

NMDOT manages their statewide ITS program through the ITS Bureau. NMDOT has established a statewide TMC at the MRCOG building located at 809 Copper Avenue NW in downtown Albuquerque. The majority of ITS field devices and operations activity occurs within the AMPA region.

The ITS Bureau staff are responsible for statewide ITS planning (including coordination of plans with local stakeholders statewide), implementation, maintenance and operations. They provide staff and systems at the TMC that dispatch HELP trucks, monitor operations using cameras and traffic detection, monitor police bands, coordinate with other agencies to manage incidents and develop public information, post DMS messages, ensure current information is provided to public via NMRoads website and the 511 phone system, and operate and maintain deployed field equipment, associated networks and applications.

6.2 NMDOT District 3 HELP Courtesy Patrol

District 3 provides the HELP Courtesy Patrol within the District. The primary function of the HELP Courtesy Patrol is to provide efficient response to clear or remove highway incidents that impede traffic flow along both I-40 and I-25 as well as Paseo Del Norte. The Courtesy Patrol provides roadside assistance to stranded motorists on the interstate and expressway systems within the metropolitan area so that they can get safely back on the road. The Courtesy Patrol also assists local law enforcement in incident management during major and minor traffic incidents on the interstate and expressway systems. They are located at the District 3 office at 7500 Pan American Freeway NE in northeast Albuquerque.

6.3 NMDOT District 3 Traffic Engineering

NMDOT District 3 Traffic Engineering is part of the Engineering Section. Traffic Engineering is responsible for traffic engineering (studies, plans, and project oversight), signing and striping, and issuing access permits. It is proposed that permitting not be relocated to the JTMC. Permitting requires public access, which is not planned to be accommodated at the JTMC.

The Assistant District Engineer for the Engineering support coordinates with the ITS Bureau regarding D3 operations.

Traffic Engineering is located at the NMDOT District 3 Office located at 7500 Pan American Freeway NE in northeast Albuquerque.

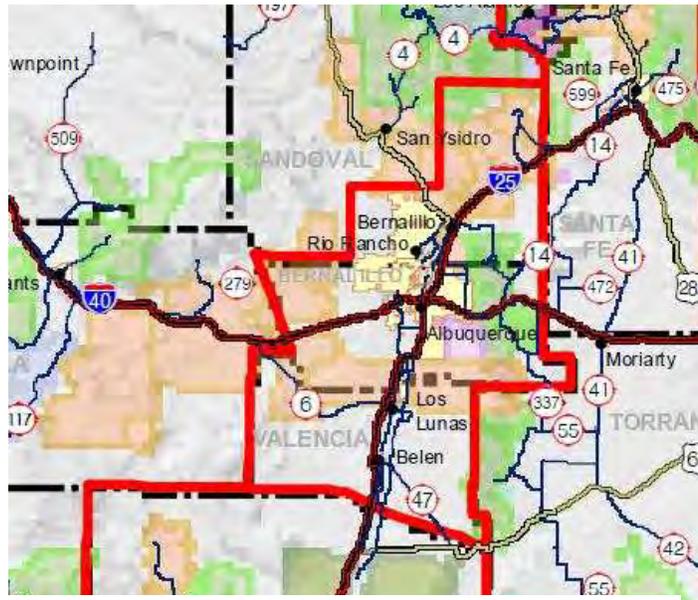


Figure 5: NMDOT District 3 Boundary

6.4 City Of Albuquerque Traffic Signals

The City of Albuquerque Traffic Engineering group is responsible for traffic signals, signs and markings and traffic analysis within the City. The Traffic Signal group manages over 600 traffic signals, plus 11 DMS and approximately 80 CCTV. Staff are located at the Pino Yard in north Albuquerque, and in a temporary trailer located on Wyoming. Staff located at the trailer are responsible for monitoring city cameras, managing traffic signal operations and signal timing, operating the DMS, and locating city utilities. The city has an extensive fiber network; about half of the signals are on fiber and the other half are on twisted pair.

There are a total of six staff, three engineers and three electricians who are mostly in the field working on intersection signals. ITE guidelines suggest that approximately 12 engineering staff would be sufficient to manage the traffic signals, communications network and DMS. Because of the staff shortage, they do not operate the City DMS, and are currently working on an agreement to allow NMDOT to operate them.

6.5 Bernalillo County Traffic Engineering

The County maintains and operates 53 traffic signals and about a dozen CCTV. Located at 2400 Broadway SE in southern Albuquerque, the County maintains a room with one workstation for signal operations and camera viewing. They operate from 8:00 AM to 5:00 PM five days a week. There is one engineer assigned to traffic management and monitoring. There are three traffic signal maintenance staff and five sign technicians.

Bernalillo County is understaffed for its current work demands. Its ability to move its entire staff is not feasible at the current time. It is proposed, however, that it would have one workstation

on the JTMC operations floor. It would rotate two staff members to provide coverage from 8am-5pm weekdays.

6.6 NM State Police District 5 Dispatch



Figure 6: NM State Police Districts

communication / dispatch centers down to just three or four centers. The current plan for migration to the JTMC is only for District 5 (although there is sufficient space for additional NMSP dispatch positions). This will need to be reviewed if or when the NMSP consolidates its operations.

The New Mexico State Police District 5 is in charge of the Albuquerque Area. It works closely with the City of Albuquerque as well as NMDOT and Bernalillo County on closures. Road closures typically require an NMSP officer in the field to make a determination, so they are often the eyes and the ears of what is happening. Most communications with the TMC and other agencies is via TTY. NMSP has access to traffic camera feeds through the NMRoads website. 911 communications and dispatch are a 24/7 operations.

In addition NMSP D5 is operating the Drunk Buster. Drunk Busters is a program which allows the public to report suspected DWI drivers through the use of a toll-free number and cell phone convenience key.

NMSP is discussing reducing the current nine statewide

7 ~~Introduction~~

The region's transportation stakeholders agree that there is a clear need to come together in a JTMC to improve normal and incident operations. However, there remain several issues to be resolved and documented with respect to the management, operations and maintenance of the JTMC. The following provides a summary of the major institutional issues that need to be addressed. The following narrative presents the key institutional issues in rough chronological order. This is not intended to be a comprehensive listing, or a strict timeline, but a presentation of the preferred stage at which to address each major item. It also overviews the level of detail anticipated to be needed at each stage of the project, for each topic. The stages are shown in Figure below. Note that some activities can occur during either the pre-design phase or the design phase.

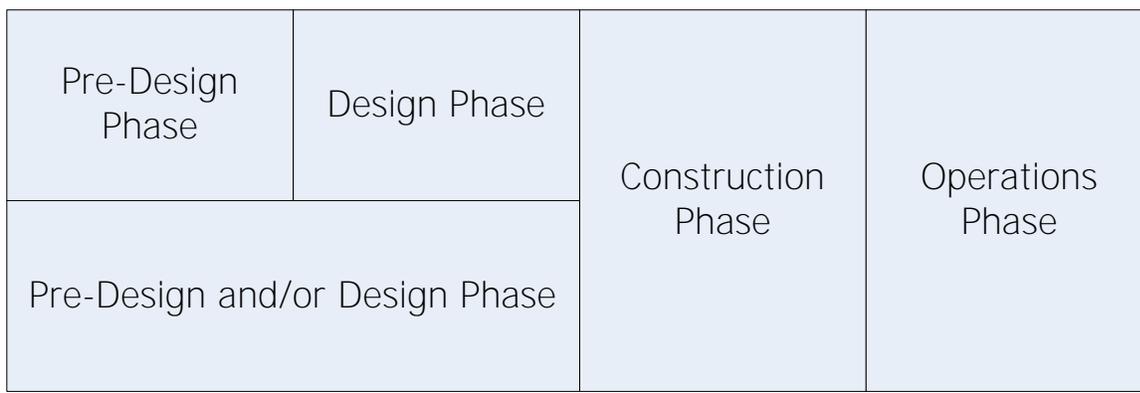


Figure 7: JTMC Development Phases

7.1 *Pre-Design Stage*

The project is currently in the pre-design stage. At this point in the process, the stakeholders have agreed upon the need to develop a JTMC, and have begun some preliminary work to assess appropriate locations, agencies to be included, and the fundamental purposes of the JTMC. The sections below highlight some of the key institutional issues facing the JTMC at this stage in the process.

7.1.1 Identification of Contracting Lead for Design and Construction

This is a regional project, with several key stakeholders. In order to proceed with design and construction, the stakeholders need to agree on a single agency or entity to serve as the contracting agency for the design and construction phases of the project. This agency may also, but not necessarily, be the contracting agency once operations begin. Key considerations for selecting a project lead are:

- Ownership of the building: The site and building are owned by the City of Albuquerque. This consideration suggests that the City of Albuquerque be the lead contracting agency at this point. It is very likely that no other agency would be permitted to lead a design or construction project for the City without entering into a Memorandum of

Understanding or other agreement. Negotiating such an agreement could take a long time.

- The capabilities and capacity of the candidate lead agency staff: This consideration addresses both the qualifications of the lead agency staff (are there staff with the right kind of experience to manage a design and construction project of this nature?) as well **as the staff's availability in light of other pre-existing commitments**. If qualified staff from the lead agency do not have sufficient availability, or if there are no qualified staff, the lead agency could consider hiring staff on a contract basis or, perhaps, borrowing staff from another stakeholder agency.

7.1.2 Selection of a Project Delivery Approach

The project should be evaluated to determine which delivery approach - design/build or design/bid/build is most appropriate. In the first approach—design/build—one contractor is hired to develop the entire project. That contractor first does the design; upon approval of the design, the contractor then builds the project. The second approach—design/bid/build—uses two contracts. The first contractor designs the project. The lead agency then uses the output from that project to solicit bids for the construction, and chooses a second contractor to build the project.

In a remodeling project, there are risks of encountering the unknown. The use of a design/build approach may help in developing creative solutions when unknowns are encountered, because the construction contractor is part of the team from the outset. That said, it is cautioned that the design/build approach should not be used to attempt to transfer risk to the Contractor. Design/build would also enable a quicker project delivery, if that is an important factor in the project. In the design/bid/build process, on the other hand, the designer, since they are not involved in the construction phase, is more likely to act as an impartial representative of the stakeholders. The choice of delivery approach should also consider the experience of the contracting agency and their project management team with design/build.

The delivery method could also potentially be Construction Manager at-Risk (CM at-risk), if allowed under current law. CM at-risk is a delivery method which entails a commitment by the construction manager to deliver the project within a Guaranteed Maximum Price (GMP). The construction manager acts as consultant to the owner in the development and design phases, (often referred to as "Preconstruction Services"), but as the equivalent of a general contractor during the construction phase. When a construction manager is bound to a GMP, the most fundamental character of the relationship is changed. In addition to acting in the owner's interest, the construction manager must manage and control construction costs to not exceed the GMP, which would be a financial hit to the CM company.

Regardless of the overall contracting method, the agencies should also consider how to implement any specialized systems needed for the JTMC. Typically, the installation of systems that support operations, console furniture, and video walls is managed separately from building construction contracts. This enables the agencies to retain greater control over these key systems that impact operations, as they can deal with a prime contractor, rather than a lower-tier subcontractor.

7.1.3 Waiver of LEED Silver requirements

The City of Albuquerque code requires all construction to meet Leadership in Energy and Environmental Design (LEED) Silver requirements. As of February, 2011, the City was considering striking that requirement from their code. If the requirement is not removed, the project should apply for a waiver. The Phase 1 project would not be able to meet the budget goals if LEED Silver requirements have to be met.

7.1.4 Assessing and Communicating the Level of Threat Protection

An evaluation of natural and manmade threats, compliant with Federal Emergency Management Agency (FEMA) guidelines, should be conducted to establish the design-basis threats for the project. Even after such a review, the project is not required to be designed to mitigate the identified threats. Cost and other factors are considered when establishing the design-basis threats. Completing a review, however, ensures that the participants understand the level of threat protection that will be provided in the building.

7.1.5 Coordination with Overall Site Use and Site Planning

The building proposed to house the JTMC sits on a larger campus with several other buildings, structures, and uses. The City of Albuquerque recently took over the site from the US Armed Forces, who had been leasing the site from the City. Because the JTMC will house public safety uses, mitigating any potential manmade threats is an important aspect of the building and site planning. Typically, facilities such as these are planned to address and minimize the impact of threats such as car-bombs, pipe-bombs, back-pack bombs, small arms fire and chemical/biological agents.

The most cost-effective means of protecting against a car-bomb is to provide a stand-off distance between the building and any locations where a car could be placed. The current site circulation layout allows vehicles to encroach on the recommended standoff. The overall site circulation should be modified. This will require coordination of the JTMC project with planning for other uses on the site.

7.1.6 Discussions with Permitting Authority on Building Classification

The International Building Code (IBC) requires that a building use classification be identified to define the required structural loads. The presence of police dispatch is a key driver in the **classification per the IBC. The classification could be "Essential Facility", if certain criteria are met, including the need for continuous operations. Often, if back-up facilities exist, the "Essential Facility" designation may not be required. If designated as an "Essential Facility", the IBC requirements for structural and other aspects would increase the cost of the facility.**

7.2 Pre-Design through Design Stage

The issues in this section can be addressed during either the pre-design stage or the design stage or both. Regardless of which phase they are addressed in, they are essential to ensure the success of the JTMC.

7.2.1 Commitment to Participate

The Phase 1 agencies must sign an MOA indicating that they will participate in the JTMC. There are two levels of participation that could be included in this MOA (Information Flow Participants should develop a third MOA at some point in the future):

- Full Participation. The stakeholders who plan to fully participate in the JTMC would be required to sign such an agreement.
- Situation Room Participation. It could be optional for Stakeholders who would only be situation room participants to sign the MOA. Although it is good to have commitment to participate in the Situation Room, it might not be required, depending on how the cost allocation model is determined. A separate MOA could be drafted for the Situation Room that indicates commitment to use the Situation Room and participate in SOP development for that room.

An MOA should address, at a minimum, the following topics:

- Mission of the JTMC
- The approach and cost allocation for implementing the JTMC and migrating current functions and work areas to the JTMC
- JTMC administrative and operations management approach
- Operations and maintenance cost allocation
- Performance Measures
- Termination of participation (i.e., if one agency wants to leave or if other agencies want to remove one agency)
- Occupancy limit, allocated by agency

Each item is addressed, below.

7.2.2 JTMC mission

The stakeholders must adopt a mission statement for the JTMC to clarify the purpose and function of the facility. A strawman mission statement was drafted as part of the Concept of Operations effort (see section 3 above), and should be used to pursue the discussion.

7.2.3 Implementation/Migration Approach and Cost Allocation

The budget for the project has yet to be finally established. Costs for implementing the JTMC and migrating functions include things such as design costs, construction costs, costs related to physically moving staff and equipment to the new location, and other start-up costs related to the new facility. In addition, there will likely be hidden costs related to staff time needed to plan, develop, and move into the JTMC.

It must be determined what level of budget support for moving into the building will be provided by each participant in the budget. If there are any overages for construction or any other budgetary costs, there needs to be agreement on how to allocate the overages.

7.2.4 JTMC Administrative and Operations Management Approach

The administrative and operations management approach, or management model, defines the organizational structure and associated rules and procedures established for the overall operations, management, and administration of the JTMC and associated program (or mission). The three main elements of a Management Model are:

- Organizational structure
- Operations and management/administration of the facility
- Operations and management administration of the associated program

Discussions regarding the Management Model should begin as soon as possible. It is a multi-faceted topic that will take considerable time to achieve consensus, and is the foundation of the JTMC MOA. The Management Model provides the basis for ongoing cost allocations, and some aspects of the model may affect the space plan.

The most common organizational structure for JTMC Management Models is a two-tier structure, as illustrate in **Error! Reference source not found.** below.

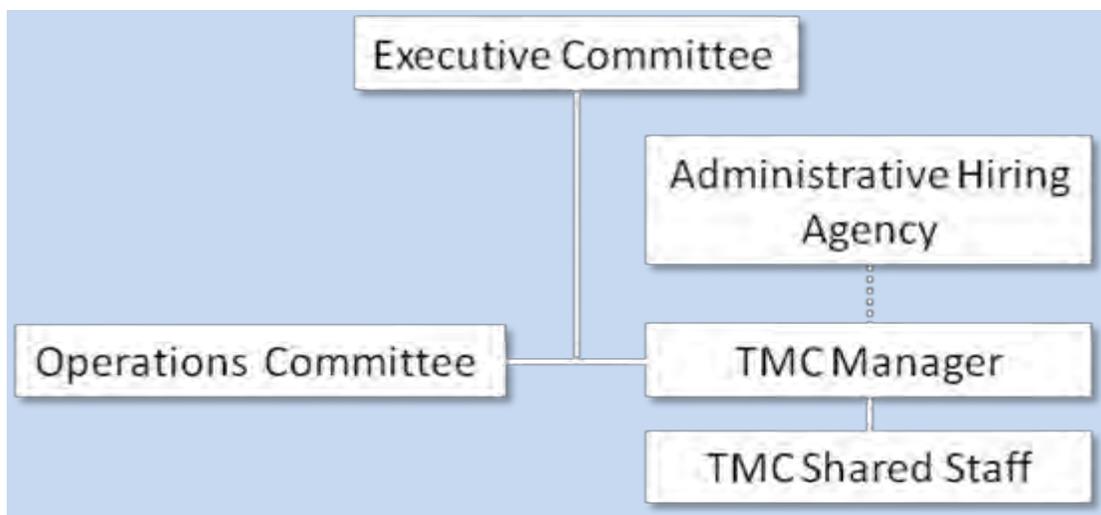


Figure 8: Two-Tier Management Model Organization Structure

The Management Model defines the membership, roles and overall rules of the Executive Committee, Operations Committee and TMC Manager. While there is some variation in terms of how the roles and responsibilities of the different bodies can be assigned, the general framework for other similar JTMCs suggests the following division of responsibilities:

Executive Committee

- Adopt policy
- Approve budgets
- Resolve disputes
- Approval for hiring/firing JTMC Manager

Operations Committee

- Draft and track the budget (with TMC manager)
- Discuss joint operations
- Establish procedures, both for the administration of the JTMC (i.e., addressing things such as security for the facility, media access, and so on), as well as for actual operations of the traffic-management functions of the JTMC.

The MOA establishes the Executive and Operations Committees, and will include language to cover:

- Members
- Leadership
- Responsibility
- Authority, including authority to establish joint performance targets
- Voting
- Meeting frequency
- Dispute resolution

JTMCs are special-purpose buildings with unique facility requirements and missions, and require personnel with knowledge of the JTMC environment to provide overall management and support. The JTMC Manager position is an administrative position that can encompass several functions, including:

- Building management
- Hiring of other support staff/external support
- **Supporting the Executive and Operations Committees' meetings (agendas, minutes)**
- Supporting the development of joint performance goals and monitoring the performance measures
- Managing all shared systems

Administratively, the JTMC manager is typically hired and paid by one agency that volunteers to perform that function. The manager is accountable to the Executive Committee that approves hiring, firing and raises beyond normal cost of living raises or normal tenure-based step raises established by the hiring agency.

What're some of the models in place in determining the functions / authorities of a JTMC

Manager. Are they typically defined within the MOA or is it something separate? If separate, does the MOA typically contain language that each of the parties to the Agreement accept those separate provisions?

7.2.5 Operations and maintenance cost allocation

The agencies must agree on how ongoing costs for normal operations and maintenance of the facility, as well as extraordinary repair or other costs will be allocated among the participants. There are several ways to allocate the costs including:

- Based on total seats per agency
- Based on total personnel per agency
- Based on square footage assigned solely to the agency, with shared spaces allocated proportionately
- Based on a qualitative assessment of benefit to the agency, which would be a result of discussions and negotiations

The normal costs to be included are:

- Utilities
- Janitorial
- Supplies
- Fund for minor repairs of shared spaces
- Security, including staffing
- Landscape and parking area maintenance
- JTMC administrative and operations shared staff salary (if any)
- Rent, depending on the approach to paying for occupancy in the building suggested by the “landlord” agency (the City of Albuquerque). **Rent could be charged based on market rates, or based on the cost of ownership of the building and associated exterior areas (parking lot, fences, etc.)**

Additionally, an approach to funding major repairs must also be agreed upon. One option is to **create a fund that is set aside to cover such repairs, as is done in a homeowner’s association.** Another is to agree to allocate costs for major repairs over a certain threshold to all agencies. Some repair costs for the facility itself could be borne by the landlord agency, depending on how that agreement is structured.

7.3 Design Stage

The following describes activities that must be completed during the Design Stage.

7.3.1 Seat Executive and Operations Committees

It is suggested that the Executive and Operations Committees be established at least mid-way during the Design Stage of the project, if not sooner. These need not be the formally-established committees, but can be assigned on a temporary basis until final agreement and MOAs for all aspects of the JTMC Management Model are completed.

7.3.2 Operations Committee Policy and Procedure Development

Before occupancy, the Operations Committee should be seated to address key policies and procedures that must be developed to ensure all parties are satisfied with overall JTMC operations when they move into the JTMC. MOAs may result from these discussions. The topics may include:

7.3.2.1 Standard Operating Procedures for normal operations

Various SOPs need to be established for normal operations. Current informal operational procedures exist, but should be documented. Improvements to current operations should also be addressed. For example, it is common that, during normal operations, agencies call one another only if they need information from the other party. It is uncommon for one agency to **share unsolicited information with others, even if it affects the other agency's operations.** A discussion of what information should be provided, when it should be provided, and how it should be provided would be useful.

7.3.2.2 SOPs for Situation Room/incident management

SOPs must be developed for all aspects of invoking and using the situation room, which is intended to support inter-agency coordination and joint command decision-making during major events. In the group meetings that were conducted in early 2011, some of the items to be addressed include:

- Adoption of a jointly-agreed upon purpose and function of the Situation Room. The JTMC will have an adopted mission statement. The purpose and function of the Situation Room should be developed in support of and alignment with that mission statement. This will also be the basis for the development of SOPs for the Situation Room. The material in this Concept of Operations can be used to facilitate these discussions.
- When is the Situation Room officially activated? In other words, what is the definition of a **"major incident"**?
- Who must be in the Situation Room when it is officially activated, and what is their required authority for participation (if any)?
- The responsibilities, both statutory and non-statutory, of each agency need to be clearly understood by all participants, and should be written down.

7.3.2.3 After-action reviews

The threshold for conducting after-action reviews, the purpose of such reviews, and how the reviews would be led and conducted, needs to be established.

7.3.2.4 Policy regarding food on the operations floor

A consensus-based policy regarding food and beverages on the operations floor should be established. This need not be a uniform policy across all agencies, as some may have work rules or requirements that affect the need to have food at the operations consoles. However, the policy should be spelled out so everyone knows it.

7.3.2.5 Sustained Operations - Family and pet sheltering

During times of extended operations, staff may wish to bring their family and/or pets to the JTMC. A policy on the presence of family and/or pets should be developed. A bunk room is also provided in the Phase 1 plan to support extended operations. A policy on the use of the bunk room needs to be established.

7.3.2.6 Use of work-out room, kitchen, bunk rooms

The JTMC will include spaces to support sustained operations, and the particular staff and operations needs of each agency. The use of any facilities that are supplied at the JTMC to meet such needs may include a bunk room, kitchen facilities, and potentially a work-out room. Agreement on the rules for shared use of these spaces must be established.

7.3.2.7 Dress Code

The agencies will likely wish to create a dress code for staff on the JTMC floor, in order to maintain a professional working environment. As with the food policy, this may vary by agency, but it will be important to spell it out.

7.3.2.8 Security and Personal Device Policy

Due to the potentially sensitive nature of the work within the JTMC, as well as the need for operations staff to focus on their work responsibilities, it may be desirable to develop a policy regarding the use of personal technology devices (such as cell phones, computers, tablets, cameras, and so forth).

7.3.3 Performance measures and measurement/reporting

The participating agencies should discuss and agree upon any joint performance measures that may be reported on for JTMC operations. It is recommended that joint performance measures be established and reported, to ensure ongoing commitment to the JTMC, and to support ongoing improvements in operations. Although each agency participating in the JTMC is likely to have its own individual performance measures, joint performance measures are sometimes difficult to gain consensus on, because of the fear that one agency or another will be seen in a poor light based on those measures. The topic requires diplomacy. Another barrier to implementing joint performance measures is that there is usually little or no **"before" data** gathered to use as a baseline. If the performance measures are established at least one year before occupancy, then the before data could be gathered.

Performance measures for the Albuquerque JTMC should be designed to address specific objectives that resulted in the JTMC being implemented. They should take into account the following topics:

- Major Incident and Event Management – Number of events per year where the JTMC co-location of stakeholders played a meaningful role in making joint decisions during major incidents and events.
- Special Event Management – **Qualitative assessment of the events' success, from a transportation and public safety perspective, based on independent surveys.**

Qualitative assessments on how well an event was performed can also include quantitative elements such as clearance times of incidents that involved coordinate activities; tracking how fast the public was notified of event occurring or an event clearing; internal measures such as how many people (officers, HELP trucks, maintenance) were on the scene; and the total time of delay.

- Standard Operation Procedures – The number of SOPs developed or revised to address traffic management. Participant evaluation of the SOPs.
- Stakeholder Relationships – Qualitative survey of the operations staff occupying the JTMC as to their relationship with other stakeholders.

7.4 Occupancy/Operations Stage

Upon occupancy, the Operations Committee should continue to work to refine and develop the policies and procedures needed for the JTMC. The procedures that were outlined during the design phase will be tested in real-time, and it is likely that adjustments and additions will be needed.

7.4.1 Automated Information Flow Participants Meetings

The third tier of participants identified in this Concept of Operations is Information Sharing Participants. It is envisioned that various agencies will share information with one another, with the hope that this information will be from as many automated sources as possible. The current NMRoads platform architecture could be used as a model to discuss the information sharing approach. Although it is possible that the NMRoads platform could be expanded to pull and fuse data from various sources, including manual entry, another tool could be selected. This discussion does not recommend any particular approach to software, as that decision should be deferred until the requirements for the Information Sharing Participants are developed.

It is suggested that a working group for the Information Sharing Participants be seated as soon as practical after occupancy of the JTMC to discuss needs and requirements. This task is deferred until after occupancy simply because there will be so much other work to be done to ensure success of the JTMC before occupancy. However, if there is adequate staff capacity, the Information Sharing Participant working group could be seated before occupancy.

8 ~~8.1~~

Two existing facilities have been presented as potential sites for the JTMC: the Bernalillo County Courthouse, and the Army Reserve Center.



Figure 9: Bernalillo County Courthouse

five buildings of various ages. The largest and most significant building is the United States Armed Forces Reserve Center at the northwest corner of the site. This two-story building was **constructed in the early 1980's and has been used as a Reserve Training Center until recently.** Because of its size, location, and construction it is being considered for the JTMC.

The existing Reserve Center building has sufficient space to support the JTMC.

8.1 Critical Facility Needs

Any site that houses the JTMC must meet critical security and parking needs. There are, of course, other key needs that must be accommodated in a JTMC, but if a facility cannot meet security and parking needs, it must be rejected.

8.1.1 Security

The incorporation of full-time and incident emergency responders and dispatch communications in the JTMC elevates the security requirements at the facility. Site and building security will depend upon consistent application of appropriate security protocols by all JTMC participants. The security strategy will need to mitigate potential threats to the uninterrupted operations of the JTMC.

Key to any security strategy is protection against manmade threats, including ballistic and explosive threats. The best protection against such threats is the establishment of a secure

The Bernalillo County Courthouse is located at 415 Tijeras in the City of Albuquerque. Several floors of the existing facility have been vacated, and space is sufficient to support a JTMC.

The existing United States Armed Forces Reserve Center (AFRC) site and buildings will be returned to the City of Albuquerque on September 15, 2011 following the expiration of a long-term lease agreement. The property is located at 400 Wyoming Boulevard NE, the northeast corner of Wyoming and Copper Avenue in the east-central portion of the City. The total existing site is approximately 20 acres and contains



Figure 10: Armed Forces Reserve Center

perimeter around the building to establish a stand-off distance between the explosive threat and the building. Depending upon the design-basis threat selected, and the level of damage considered acceptable, the desired stand-off could range from 65 to over 2000 feet. The process for selecting the design-basis threat for the JTMC has not begun, but based on similar US facilities, the design basis threat for the JTMC is likely to require a stand-off distance of 100 to 200 feet.

8.1.2 Parking

Parking is a critical issue for the JTMC site. Not only will parking be required for full-time participants and visitors, convenient and readily available parking is required to support the Situation Room function. If parking is difficult, some Situation room participants may not come to the JTMC.

8.2 Selection of the Preferred Alternative

The Bernalillo County Courthouse cannot meet either critical facility need. The Courthouse building abuts the back of the sidewalk, providing essentially no stand-off distance. In addition, there is no parking connected directly to the Courthouse.

The AFRC facility is the preferred alternative for the JTMC. The site provides the ability to provide sufficient and secured parking. Stand-off distances are sufficient along most of the building perimeter. Where stand-off is not sufficient, it can be provided with modifications to the overall site circulation plan, or through modification of the structure itself to withstand blast effects on the core operations area.

The AFRC site was further reviewed and a Feasibility Assessment provided under separate cover.

Appendix A – Stakeholders Contacted During Development of Concept of Operations

Agency	Department
NMDOT	Statewide and District 3 ITS (including courtesy patrol)
NMDOT	District 3 Maintenance
NMDOT	District 3 Traffic Operations
City of Albuquerque	Traffic Operations
City of Albuquerque	Police Dispatch
Bernalillo County	Combined Dispatch
Bernalillo County	Traffic Operations
New Mexico State Police	D5 State Police Dispatch and Drunk Line
Bernalillo County	Sheriff's Office
MRCOG	Rail Runner
City of Albuquerque	Transit
City of Albuquerque	Office of Emergency Management
City of Albuquerque	APD - Traffic
City of Albuquerque	APD - Foothills or other command
City of Rio Rancho	Traffic Operations
City of Albuquerque	Street Maintenance
City of Rio Rancho	Police
Sandoval County	Communications (SCRECC)
Sandoval County	Sheriff's Office
Sandia Pueblo	Police
Santa Ana Pueblo	Police
Expo New Mexico	
Isleta Pueblo	Police Traffic
Sandia National Laboratory	
University of New Mexico	Police
Valencia County	Sheriff's Office
Town of Bernalillo	Police
Village of Los Lunas	Sheriff's Office