

December 23, 2014

TO: Members of the MAG Intelligent Transportation Systems Committee

FROM: Catherine Hollow, City of Tempe, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, January 7, 2015- **10:30 a.m.**  
MAG Office Building, 2<sup>nd</sup> Floor, Ironwood Room  
302 North First Avenue, Phoenix

The ITS Committee has been scheduled at the time and place noted above. Committee members or their proxies may attend **in person or by video conference or by telephone conference call**. Those attending by telephone conference call please contact MAG offices for conference call instructions.

Please park in the garage under the MAG building, bring your ticket, parking will be validated. For those using transit, Valley Metro/RPTA will provide transit tickets for your trip. For those using bicycles, please lock your bicycle in the bike rack in the garage.

In 1996, the Regional Council approved a simple majority quorum for all MAG advisory committees. If the ITS Committee does not meet the quorum requirement, members who have arrived at the meeting will be instructed a legal meeting cannot occur and subsequently be dismissed. Your attendance at the meeting is strongly encouraged.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Jason Stephens at the MAG office. Requests should be made as early as possible to allow time to arrange the accommodation.

If you have any questions regarding the meeting, please contact Sarath Joshua at (602) 254-6300.

## TENTATIVE AGENDA

	<u>COMMITTEE ACTION REQUESTED</u>
<p>1. <u>Call to Order</u></p> <p>For the January 7, 2015 meeting, the quorum requirement is 10 committee members.</p>	
<p>2. <u>Approval of the December 3, 2014 Meeting Minutes</u></p>	<p>2. Review and approve minutes of the meeting held on December 3, 2014.</p>
<p>3. <u>Call to Audience</u></p> <p>An opportunity will be provided to members of the public to address the ITS Committee on items not scheduled on the agenda that fall under the jurisdiction of MAG, or on items on the agenda for discussion but not for action. Members of the public will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the ITS Committee requests an exception to this limit. Please note that those wishing to comment on action agenda items will be given an opportunity when the item is heard.</p>	<p>3. For information and discussion.</p>
<p>4. <u>Program Managers Report</u></p> <p>The following items will be discussed:</p> <ul style="list-style-type: none"><li>• Status of TSOP Projects</li><li>• Status Report on the RCN</li></ul>	<p>4. For information and discussion.</p>
<p>5. <u>Systems Management &amp; Operations Plan</u></p> <p>During the MAG review and approval of funds for the expansion of the Freeway Management System (FMS), the committee identified the need and recommended a MAG study to produce a guidance document to support long-range planning and to identify future investments required in technology infrastructure and for efficient management and operation of the freeway and arterial systems. This idea of a MAG</p>	<p>5. For information and discussion.</p>

study was further endorsed by the Transportation Review Committee and the Management Committee. It is anticipated that the study would produce the region's Systems Management and Operations Plan. The Plan would help identify and prioritize both infrastructure and operating resource needs that are driven by system performance metrics such as safety, congestion and reliability.

The draft scope of work developed for this study (See Attachment One) addresses both freeways and arterials. New paradigms for both funding, planning and operating of key transportation facilities will be explored in this study. For example, all regional freeways would be expected to be managed and operated as integrated corridors where feasible. As a result, freeways and nearby parallel arterials would be planned for and operated as integrated facilities by all affected jurisdictions.

This scope of work with refinements, based on review comments by the committee, will serve as the basis for the study to be included in the MAG FY2016 Work Program.

6. Developing Traffic Management Response Plans for Freeway Closures: I-10 West and US 60 Projects

Two of the FY2014 TSOP projects involved the development of corridor arterial traffic management plans that would be utilized whenever the arterial is impacted by a major diversion of traffic from a parallel freeway.

One of these projects, extended similar previous work for the I-10 West segment between I-17 and Loop 101 Agua Fria. The second project developed diversion plans for the US 60 corridor between I-10 and Loop 101 Price.

6. For information and discussion.

Each of these projects involved close coordination with the local agencies, ADOT and DPS. A process similar to that being followed in the national Integrated Corridor Management (ICM) demonstration projects was followed, including Analysis and Simulation Modeling (AMS) using the MAG Dynus-T model.

A brief overview of the two projects, lessons learned and next steps will be provided.

7. Reports by Committee Members

Members will be provided an opportunity to share information related to ongoing ITS activities in their jurisdictions.

8. Request for Future Agenda Items

Topics or issues of interest that members of the committee would like to have considered for discussion at a future meeting will be requested.

9. Next Meeting Date and Place

The next meeting is scheduled to be held at 10:00 a.m. on Wednesday, February 4, 2015. It will be held in the Ironwood Room on the 2<sup>nd</sup> Floor of the MAG office building.

Adjournment

7. For information and discussion.

8. For information and discussion.

9. For information.

**DRAFT MINUTES OF THE  
MARICOPA ASSOCIATION OF GOVERNMENTS  
INTELLIGENT TRANSPORTATION SYSTEMS COMMITTEE**

December 3, 2014

MAG Ironwood Room, 2nd Floor  
302 North First Avenue  
Phoenix, Arizona

MEMBERS ATTENDING

- |                                    |                                    |
|------------------------------------|------------------------------------|
| * Reza Karimvand, ADOT             | Luke Albert, City of Goodyear      |
| Chris Hamilton, City of Avondale   | Nicolaas Swart, Maricopa County    |
| * Chris Lemka, City of Buckeye     | Avery Rhodes, City of Mesa         |
| Mike Mah, City of Chandler         | # Ron Amaya, City of Peoria        |
| Captain Burley Copeland, DPS       | Marshall Riegel, City of Phoenix   |
| Bryce Christo, City of El Mirage   | # Steve Ramsey, City of Scottsdale |
| Toni Whitfield, FHWA               | Albert Garcia, City of Surprise    |
| # Eric Guderian, for Leslie Bubke, | Catherine Hollow, City of Tempe    |
| Town of Gilbert                    | Amanda Luecker, Valley Metro       |
| Allan Galicia, for Debbie Albert,  |                                    |
| City of Glendale                   |                                    |

OTHERS PRESENT

- |                               |                       |
|-------------------------------|-----------------------|
| Paul Porell, MCDOT            | Dan Hartig, Ayres     |
| Jason Tyre, Phoenix PD        | Don Wiltshire, YSMA   |
| Aaron Felix, City of Maricopa | Suzy Chambers, Dibble |
| LeShawn Charlton, MCDOT       | Dave Riley, UCG       |
| Karl Zook, City of Surprise   | Sandra Thoms, Jacobs  |
| David Lucas, City of Tempe    | Stephen Doubek, PB    |
| Jessica Koon, Valley Metro    | Margaret Boone, MAG   |
| Lisa Burgess, KHA             | Ryan Gish, MAG        |
| Jeff Jenq, OZ Engineering     | Micah Henry, MAG      |
| Dan Marum, Wilson             | Sarath Joshua, MAG    |
| Dan Tappendorf, TEC           | Eric Nava, MAG        |
| Rob Dolson, City of Maricopa  |                       |

- \* Not present or represented by proxy
- # Participated by teleconference
- + Participated by videoconference

1. Call to Order

Chair Catherine Hollow called the meeting to order at 10:00 a.m.

2. Approval of the November 5, 2014 Meeting Minutes

Chair Hollow requested approval of the meeting minutes from the November 5<sup>th</sup> ITS Committee meeting. **Nicolaas Swart from MCDOT moved, Marshall Riegel from Phoenix seconded and it was unanimously carried to approve the minutes of the meeting held on November 5, 2014.**

3. Call to Audience  
Chair Hollow made a call to the audience providing an opportunity for any members of the public to address the ITS Committee. No comments were received.
4. Program Manager's Report  
Chair Hollow invited Sarath Joshua from MAG to present the Program Manager's Report. Mr. Joshua addressed the following items in his report:
  - Current Status of TSOP Projects:  
A total of 11 TSOP projects, five have been completed, six projects are underway. These projects are scheduled to be completed by January 2015. The FY2015 TSOP project list was recommended for approval by TRC and Management Committee, and the Regional Council approval is set for December 3<sup>rd</sup>. Once approved the task orders will be developed in January and February 2015. Projects will be initiated and completed by June 2015.
  - Status Report on the Regional Community Network (RCN)  
Sarath Joshua requested that Ryan Gish from MAG provide an update on the latest RCN developments. Mr. Gish detailed the completion of firmware update of the core and outlying RCN switches to improve efficiency and video streams. MAG is working with Valley Metro to add them to the RCN. The connection will be from Valley Metro's Operations Center to City of Phoenix's Calvin Goode building. Mr. Gish also reported on continuation of work with the City of Tempe to provide network assessment and services. Mr. Gish updated the Committee on the Regional Fiber Optic Mapping Project. MAG staff has received several fiber infrastructure data files from participating agencies to be added to the database. The effort is on-going. Mr. Gish is also working with City of Peoria in extending the RCN connection and traffic cameras to city's police department.
  - Planned ITS Committee Meeting Schedule for 2015  
Sarath Joshua presented the proposed meeting schedule for the ITS Committee for 2015. The dates are January 7<sup>th</sup>, February 4<sup>th</sup>, March 4<sup>th</sup>, April 1<sup>st</sup>, May 6<sup>th</sup>, June 3<sup>rd</sup>, July 1<sup>st</sup>, August 5<sup>th</sup>, September 2<sup>nd</sup>, October 7<sup>th</sup>, November 4<sup>th</sup>, and December 2<sup>nd</sup>. The committee meeting schedule for July 1<sup>st</sup> is likely to be canceled due to its proximity to the Fourth of July holiday.
  - National Developments  
Sarath Joshua identified the National Operations Center of Excellence (OCoE), supported by AASHTO, ITS America, and ITE. The stated goal is to "work together to provide technical leadership, sharing of best practices, research, and professional education and training to practitioners, policymakers, and researchers to advance Transportation Systems Management & Operations (TSM&O)."
  - 2015 TRB Annual Meeting – Increased Focus on TSM&O  
Sarath Joshua announced the upcoming TRB annual conference next month, highlighting the scheduled TIM Workshop – "Seeking Support & Funding for TIM at the MPO – Lessons Learned". Mr. Joshua will highlight the effort to co-locate DPS officers at the TOC as well as the I-10/I-17 Spine Project funds for

full-time employees. Another session is the two-part session on “Establishing TSM&O as a National Commitment”. Mr. Joshua will be providing the MPO perspective and will be requesting input from member agencies. The last session highlighted is on “Programming for Regional TSM&O – Experiences from Across the U.S.”

5. Bell Road Adaptive Signal Control Technology Project

Chair Hollow invited Nicolaas Swart with MCDOT to present the agencies deployment of Adaptive Signal Control Technology (ASCT) on Bell road. The \$2.7 million project is funded through the MAG RTP and the implementation is scheduled to initiate in 2015. Maricopa County is the lead agency and is coordinating with ADOT, City of Surprise, City of Peoria, City of Glendale, City of Phoenix, and City of Scottsdale. The purpose of the project is to improve traffic operations through better signal coordination, address variable and unpredictable traffic patterns, reduce delay and travel time, manage queues, and improve safety. Mr. Swart asked Paul Porell with MCDOT to further describe the project. Mr. Porell stated that the project was developed by the AZTech Bell Road Operations Committee. It was recommended for MAG funding by the ITS Committee and was programmed in the MAG TIP. FHWA provided workshops to train agency staff on ASCT systems. The project will involve four segments of the Bell Road corridor, seven agencies, 15.6 miles, and 51 signalized intersections. The procurement process may include up to four different adaptive signal control technologies. The project will also install ARID sensors will be used to collect performance metrics and monitor congestion.

The four project segments are: SR-303 & Grand Avenue, Loop 101, I-17, and Frank Lloyd Wright & Loop 101. The projects is funded through the MAG RTP with federal CMAQ funds including \$318,134 for design and \$2,455,000 for construction, scheduled for FY2015. The procurement of adaptive systems will be conducted for each of the four project areas and involve competitive sealed proposals. The proposals will be evaluated for qualifications, ability to meet technical requirements, and the cost component. The procurement for the detection and ARID sensor deployment will be based on low bid.

Moving forward, the project requires environmental clearances, defining ground disturbance in the “worst case” scenario. The level of effort will be significant, involving 51 intersections. The initial project efforts identified 16 potential ground disturbance locations. Plans, specifications, and cost estimates are scheduled from completion by April 2015. Construction authorization is anticipated by Summer of 2015. Following that the Request for Proposals will be advertised. The ARID detection bid will be advertised in Fall 2015.

Avery Rhodes with the City of Mesa asked if it was anticipated that there would be new traffic signal equipment installed as part of the project and if there would be one adaptive system or multiple systems for the overall project. Mr. Porell stated that there could be up to 4 adaptive systems for each subarea of the project and that for the most part existing controllers would remain in place with a handful of replacements.

Sarath Joshua asked if the ASCT would be operated on a 24/7 basis or only during certain times of the day. Mr. Porell responded that individual agencies that would be responsible for the operation of the segments would determine that.

6. Video Sharing During the 2015 Super Bowl Event  
Chair Hollow invited Ryan Gish to introduce City of Phoenix Detective Jason Tyre to discuss the video sharing access for multiple agencies in coordination with Super Bowl activities scheduled for next year. Detective Tyre discussed the goal of sharing traffic CCTV cameras between coordinating agencies and utilizing the RCN as a secondary communications path. The Multi-Agency Coordination Center (MACC) will be coordinating with the Intelligence Operations Center (IOC) for shared communications with the Gila River Indian Community, City of Glendale, City of Phoenix, and City of Scottsdale. The forecast for upcoming events includes over 1 million visitors estimated for Super Bowl Central in downtown Phoenix and 700,000 visitors for the Waste Management Open. Super Bowl Central includes 12 city blocks in downtown Phoenix. It is expected that over 320 events at multiple venues throughout the region will be hosted within this time frame.
  
7. Reports by Committee Members  
Chair Hollow called on members to report items of interest to the committee. Eric Guderian with Town of Gilbert reported on the town's Northwest Fiber Loop Project. Ron Amaya with City of Peoria reported on the development of a half-mile connection for fiber communications as well as the establishment of the IGA with ADOT. Steve Ramsey with City of Scottsdale announced the cancelation of the planned Highway Advisory Radio (HAR) project, which is to be removed from the MAG TIP. Avery Rhodes with City of Mesa reported that adaptive traffic signal control is deployed in the Fiesta District, including the Fiesta Mall, Mesa Community College and Banner Desert Hospital. City of Mesa is using the Kadence Real-Time Adaptive Control System by Kimley-Horn and Associates. Allan Galicia with City of Glendale reported on the city's preparation for the 2015 Super Bowl with regards to parking surrounding the stadium. Albert Garcia with the City of Surprise reported on the coordination with construction of the Grand Avenue and Loop 303 TI. Marshall Riegel with City of Phoenix reported on the project to deploy wireless communications in the west valley. Nicolaas Swart with MCDOT announced that the agency's position for traffic engineer was advertised.
  
8. Request for Future Agenda Items  
There were no requests for future agenda items.
  
9. Next Meeting Date and Place  
Next meeting date was announced at 10:00 a.m. on Wednesday, January 7, 2015, in the Ironwood Room (2<sup>nd</sup> floor) at MAG.
  
10. Adjournment  
Chair Catherine Hollow adjourned the meeting at 10:45 a.m.

12/22/14

## **Systems Management and Operations Plan**

### **Study Background:**

Systems Management and Operations (SM&O) in the context of the Regional Transportation Plan refers to a regionally integrated approach that continuously strives to optimize the performance of the multi-modal transportation system. This is accomplished through multi-modal, cross-jurisdictional systems and services. These systems need to be planned, designed, built and operated in a seamless manner to improve efficiency, safety and reliability of the transportation system. The implementation of SM&O programs helps ensure the safe and efficient movement of people and freight within the regional transportation system. The full spectrum of transportation technology infrastructure, known as Intelligent Transportation Systems (ITS), and skilled agency staff that utilize them serve as the foundation of SM&O programs. The MAG Regional Transportation Plan (RTP) has made substantial investments in this infrastructure in the in two parts – Freeway ITS and Arterial ITS. In addition to regional funds, local agencies also provide funds for Arterial ITS infrastructure. All Freeway ITS applications are collectively referred to as the Freeway Management System (FMS) and RTP funds were allocated to build a certain coverage of the freeway system. For Arterial ITS, RTP funds were allocated for the 20 year duration and then accelerated to the first 10 years that ends in FY2018. Funds for Arterial ITS projects are programmed based on project applications and a technical evaluation process that is guided by the ITS Strategic Plan and other MAG and federal planning requirements. At present, RTP funds allocated for Arterial ITS have been programmed through FY2017 with funds remaining for one more year of projects. RTP funds for the FMS have been programmed through FY2019, with remaining funds more than adequate for completion of the original planned FMS coverage.

A study to help guide future regional investments in the Freeway Management System (FMS) was initially recommended by the MAG ITS Committee along with the committee's recommendation of RTP funds for new FMS infrastructure, beyond FY2014. During the approval process, members of the Management Committee and the Transportation Review Committee endorsed and expressed much interest in the study and have requested that a detailed scope of work be presented to them prior to moving ahead with the study through the FY 2016 MAG Work Program.

Over the last 15 years, the MAG region has made significant investments in building ITS infrastructure required for improving SM&O. As a result, the region has some of the best ITS infrastructure in the nation. However, due to the emergence of better solutions and technology advances, a new approach is required to guide future regional investments in SM&O

that would be performance based and linked to regional priorities. This MAG study is proposed, in response, to define the long-term vision for SM&O and develop a guidance document for reaching that vision, without being constrained by institutional barriers, practices or resource limitations. The study will assume that all future SM&O programs and proposed projects would be evaluated using performance-based criteria. The study will address local agency staff resources dedicated for traffic operations that is often critical for achieving higher levels of performance using SM&O infrastructure. Strategies will be recommended that would help ensure that adequate staff resources are planned for or available, at the operating agencies, to gain the desired benefits from the regional investments in SM&O infrastructure. This may also require modifications to the current programming process to provide regional funds to support critical operations.

**Study Goal:**

The goal of this MAG study is to produce a guidance document or a plan for strategic investment decisions related to the necessary technology components and resources for operating critical elements of regional transportation infrastructure. , required for the efficient operation and management of the following elements of the regional transportation system: (a) urban freeway system, including fully integrated corridor operations with the adjacent arterial streets; (b) Strategic Arterial Road (StAR) Network – all major arterials classified based on regional priority using criteria such as, integrated corridor routes (5★), key gateway routes (4★), key freight routes, key transit routes, etc.

It is well accepted among transportation operations professionals that freeway systems cannot be effectively managed in isolation. Freeway operations must be coordinated with adjacent arterials, and also with other transportation modes within the effective corridors. The institutional structure in the MAG region, and also many other urban regions, with split ownership where the freeways are managed by the state DOT and adjacent arterials are managed by local agencies makes coordinated traffic management a challenging task. However, in many other fields, effective technology solutions have been instrumental in forging innovative coordination mechanisms to overcome similar barriers. This study will explore such solutions and also investigate feasible alternate institutional structures and business models for efficient delivery of services, based on current best practices.

The study will address SM&O by focusing on a two tiered hierarchy of road facilities: (a) Tier I - Freeway Corridors – including adjacent arterials; (b) Tier 2 – StAR Network.

- (a) Freeways are currently managed and operated by ADOT utilizing the Freeway Management System; adjacent city arterials serve as feeder routes and detour routes during emergencies and periods of heavy traffic congestion;

- (b) Principal Arterials that make up the StAR Network provides connectivity and critical access to all destination points beyond the reach of freeways;

The freeway corridors provide the safest and most efficient (from the perspective of moving goods and people) form of travel, and play a role in supporting the regional economy. Hence, maintaining efficient SM&O on freeway corridors is a high priority for the region. The principal arterials also play an important role in the regional economy. However, the SM&O goals for these facilities may vary even within a single jurisdiction. To establish consistent SM&O goals across the entire region, it would be necessary to identify Key Principal Arterials based on a set of criteria.

The study will develop the desired Regional Concept of SM&O for the year 2038, taking into account on-going research and development efforts such as the Connected Vehicle Technology, information and communication technology trends, and emerging practices in advanced traffic management and operations. The year 2038 has been selected to align this effort with the horizon year of the next anticipated RTP update.

The study will accomplish the following:

- (a) Identify best SM&O practices
- (b) Review the current FMS infrastructure; Compare its performance, with reference to freeway management practices, to similar systems in comparable urban regions in USA – Salt Lake City, UT; San Diego, CA; Denver, CO; Seattle, WA; Identify lessons learned.
- (c) Establish 2038 SM&O vision and goals, for the MAG region.
- (d) Recommend an evolutionary path, intermediate goals, and strategic investments needed to reach the 2038 vision and goals.
- (e) Establish a process for Performance Measurement & Oversight

**Study Objectives:**

The study objectives would be to:

1. Identify best urban SM&O practices – both US and international -- a
  - a. identify the supporting institutional framework
  - b. identify alternate business models being used
2. Review the current FMS operations, compare with best practices and: -- b
  - a. Identify key areas/functions that needs to be improved
  - b. Identify New functions such as ICM and ATM
  - c. Key enablers such as better institutional support, resources, business processes
  - d. Perform a comprehensive evaluation of the life-cycle of current FMS technology infrastructure
  - e. Identify lessons learned
3. Define the 2038 Regional Concept of SM&Operations for managing the freeway and arterial corridor operations, based on the best available predictions of future technology evolution. Recommend a technology adoption strategy to help keep abreast of new developments such as probe vehicle data, private sector data, in-vehicle driver advisories, Connected Vehicle communications
4. Recommend a path forward for the next 20 years to reach the desired 2038 Concept of Operations, as a phased implementation plan for 5, 10 and 15 years.
5. Recommend a process for data collection, independent performance measurement and reporting
6. Recommend a framework for inter-agency oversight and an annual performance review

**Task 1: Best Practices in Urban Freeway Management & Operations**

A literature review will be conducted to identify and document the best practices, both in USA and internationally, in freeway management and operations. Some of the questions that will be explored during this review are:

How are other major urban regions organized, both institutionally and financially, to manage and operate their urban freeway systems? – This review should include at least 3 urban regions similar to the MAG region in facility ownership.

How are the reviewed major urban regions organized to coordinate freeway operations with adjacent arterial facilities owned by local agencies?

What is the level of coordination with law enforcement and other stakeholder agencies during major incidents?

What percentage of TMCs have enforcement staff co-located on site? How are they funded? What are the identified benefit-costs and anecdotal evidence?

How much of the traffic operations functions are automated and how are such systems staffed?

What analytical tools are being used to help refine operations?

Staffing – qualifications, training and certification requirements, position descriptions and salary ranges.

How is performance measurement carried out? What metrics are used? How independent or transparent is the process? Are periodic or ongoing web-based performance reports provided?

Data sharing with the MPOs for performance measurement – What is the process for quality control of data?

What is the oversight process for key technology investment decisions? Is there an established technical oversight process that involve a panel of experts?

What is the current strategy/decision process for the adoption of appropriate new technologies to replace old technologies? Considerations of equipment life-cycle, annual maintenance cost, system reliability degradation.

## **Task 2: Review of Current FMS & Lessons Learned**

### **2.1 FMS coverage, budget, staffing**

This task will perform a review of the current FMS and identify any lessons learned. The execution of this task will answer the following questions:

What is the current FMS coverage in miles, and what additional coverage is currently planned and programmed? What criteria are currently used to arrive at prioritizing coverage expansion needs?

How is the FMS infrastructure and operations funded by ADOT & MAG? - FMS infrastructure funded by the MAG RTP; FMS operations (Phoenix component) funded by ADOT & MAG

What are the basic infrastructure features and operations elements – Fiber-optic backbone, CCTV, ramp meters, DMS, Alert, FSP, Centralized ATMS for ramp meters and interchange traffic signals

What is the approximate division between statewide and MAG region responsibilities of TOC operations?

Identify the range of traffic management functions currently performed by FMS staff. Describe current FMS staffing, qualifications and expertise.

Assess how well the FMS is performing basic functions in comparison to other TMCs? Identify any key areas and functions that need to be improved. Identify key enablers such as better institutional support, resources, business process improvements.

What is the business case for supporting the current FMS operation? What are the likely benefits accrued and the estimated annual Return on Investment (ROI)?

## **2.2 Current FMS Functions and Concept of Operations**

This task will clearly define all FMS functions that are currently being performed. Many features of the current FMS concept is based on state-of-the-practice in mid-1990s and was developed accordingly. Since then many changes have occurred in technology, including some new functions carried out by the FMS.

Develop a high level FMS Concept of Operations that would describe all current aspects of the FMS functions and operations. This will be limited to currently established FMS functions and will not include any new functions that are being studied and yet to be established.

## **2.3 Evaluation of the Life-Cycle of Current FMS Technology**

Perform a comprehensive re-evaluation of the life-cycle of FMS technology infrastructure currently being utilized. Identify what key technologies have proven to be effective so far and assess how much longer each particular technology is viable. Investigate if the FMS function supported by a specific technology is addressed by another more efficient technology or an established service provider with an efficient and more economical solution.

This task will also identify which FMS technology needs to be replaced.

This task would also include the following:

- Draw on Task 1 findings on the state of the practice review of urban FMSs and produce a comparison of key functions

## **2.4 Lessons Learned**

Identify lessons learned from the FMS implementation over the last 20 years.

### **Task 3: 2038 Vision and Concept of System Management and Operations**

This task will define the 2038 vision and concept of SM&O for the freeway-arterial operations in the MAG region, based on: (1) All infrastructure improvements identified in current MAG plans for this period; (2) Sound assumptions on the likely influence of emerging technological advances in areas related to mobility; (3) Other likely trends in travel behavior and travel patterns.

In addition to close coordination between freeways and arterials, the Concept of Operations would incorporate improvements that are likely to emerge over the 20 year period with varying degrees of certainty such as:

- Implementation of Active Traffic Management at appropriate locations in several phases. This will draw upon the current experience of ATM implementation in the US and network screening guidelines to identify the best potential ATM sites.
- Migration to new traffic data sources including detection technology, probe vehicles and private sector data sources.
- Refinements to Freeway-Arterial Operations for Integrated Corridor Management
- Desired freeway safety features such as a system to reduce wrong-way entry at ramps
- Relevant applications based on Vehicle-to-Vehicle (V2V) communications
- Relevant applications based on Vehicle-to-Infrastructure (V2I) communications

Identify key challenges (from today's perspective) to achieving the 2038 vision. Identify possible solutions for such challenges, including a more effective regional institutional framework to support traffic operations and management. The 2038 vision should not necessarily be constrained by the existing institutional structure of ownership and facility management.

- Staffing needs, funding requirements and tools for complex traffic operations – are the agencies adequately equipped with staff with the right skills

### **Task 4: Evolutionary Path for Reaching the 2038 Concept of Operations**

Recommend an evolutionary path for reaching the 2038 vision or concept of freeway-arterial operations. This evolutionary path will define a realistic phased implementation plan, such as:

Phase 1 (2020 - 2024) – Implement Prop 400 FMS coverage; Implement ICM on I-10W and US-60 corridors. Establish virtual sub-regional TMCs. Initial implementation of Active Traffic Management (ATM) with Variable Speed Limits in the I-17 corridor. Real-time predictive simulation modeling to support traffic management.

Phase 2 (2025 - 2029) – Implement fully integrated traffic operations between all urban freeways and adjacent arterials. Implement Active Traffic Management with Variable Speed Limits on fwy segments that operate at level of service D or worse during AM or PM peak periods and experience high crash occurrence.

Phase 3 (2030 - 2034) – Active Traffic Management implemented on all freeway segments that; Broadcast of in-vehicle alerts.

Phase 4 (2035 - 2038) – TBD

It is anticipated that the evolutionary path forward may include the concepts:

Virtual Traffic Management Centers: These TMCs would not require a physical facility, are fully functional and cost effective.

Sub-regional Traffic Management Centers: Coordination of traffic management among many agencies in a vast region may be best addressed through a number of sub-regional TMCs. Institutional agreements would be required for sub-regional TMCs. It is conceivable that several sub-regional TMCs that would perform traffic management functions across the entire MAG planning area (including areas of Pinal County within the MAG planning area).

#### **Task 5: Data Collection, Performance Measurement and Reporting**

Identify the need for coordination between freeways (ADOT) and arterials (local agencies) and MAG for gathering the data required for performance measurement. System performance will be reported at the MAG Performance Measurement website.

Establish the metrics and the methodology to be used to measure performance on the freeway-arterial corridor – TT reliability metrics; and the responsibilities for data collection, data analysis, reporting frequency.

A funding plan that would provide sufficient funds to support regional fwy operations.

10 yrs – phase out technology that has served its purpose

10 yrs – Recommend an institutional framework that would be supportive of integrated operations

**Task 6: Recommend a Framework for Inter-Agency Oversight and Bi-Annual Performance Review**

This task would recommend a framework for establishing a Technical Oversight Team that would include key stakeholder agencies. The purpose of the TOT would be to conduct periodic reviews (quarterly) of progress and possibly help resolve any issues.

A recommendation would also be provided for establishing the format for a bi-annual performance review of freeway-arterial corridor operations by several MAG committees, including TRC, MC and RC. System performance metrics will be based mostly on MAG performance monitoring reports.

December 18, 2014

TO: Members of the MAG Technology Advisory Group  
Members of the MAG Intelligent Transportation Systems Group

FROM: David L. Stevens, Maricopa County, Chair Technology Advisory Group  
Catherine Hollow, City of Tempe, Chair Intelligent Transportation Systems Committee

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF AGENDA FOR  
THE JOINT MEETING OF THE MAG INTELLIGENT TRANSPORTATION SYSTEMS AND  
THE TECHNOLOGY ADVISORY GROUP

Wednesday, January 7, 2015, 10:00 a.m. - 10:30 a.m.  
MAG Office, Suite 200 - Ironwood Room  
302 North 1<sup>st</sup> Avenue, Phoenix

A joint meeting of the MAG Intelligent Transportation Systems Committee and the Technology Advisory Group has been scheduled for the time and place noted above. Members of the Committee may attend the meeting either in person or by telephone conference. For those using transit, the Regional Public Transportation Authority will provide transit tickets for your trip.

Please be advised that under procedures approved by the MAG Regional Council on June 26, 1996, all MAG committees need to have a quorum in order to conduct business. A quorum is a simple majority of the membership. If you are unable to attend the meeting, please make arrangements for a proxy from your jurisdiction to represent you.

If you have any questions regarding the Technology Advisory Group agenda items, please contact Craig Chenery at (602) 254-6300.

## JOINT ITS AND TAG AGENDA

### 1. Call to Order

The joint meeting of the ITS Committee and the TAG will be called to order. The quorum requirement for the ITS Committee is 10 committee members, and quorum requirement for the Technology Advisory Group is 9.

### 2. Call to the Audience

An opportunity will be provided to members of the public to address the joint meeting of the ITS Committee and the Technology Advisory Group on items not scheduled on the agenda that fall under the jurisdiction of MAG, or on items on the agenda for discussion but not for action. Members of the public will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the ITS Committee or MAGTAG requests an exception to this limit. Please note that those wishing to comment on action agenda items will be given an opportunity at the time the item is heard.

### 3. City of Phoenix PD RCN No Cost Addition

The City of Phoenix Police Department has requested a no-cost service addition to the Regional Community Network that requires both TAG and ITS approval. This addition aims to provide a communications path for CCTV cameras between participating law enforcement agencies. The goal is to use this path in support of activities and unplanned incidents surrounding the Super Bowl and future.

### 4. Adjournment

2. Information and discussion.

3. For information and discussion.

