



July 1, 2019

TO: Members of the MAG Intelligent Transportation Systems Committee

FROM: David Lucas, City of Tempe, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, July 10, 2019 - 10:00 a.m.

MAG Office Building, 2nd 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 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 Jeff Jenq at (602) 254-5031.

TENTATIVE AGENDA

COMMITTEE ACTION REQUESTED

1. Call to Order

For the July 10, 2019 meeting, the quorum requirement is 11 committee members.

2. Approval of minutes from the ITS Committee meeting held on June 5, 2019.

3. Call to the Audience

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.

4. Staff Report

The following items will be discussed:

- Conclusion of 2019 TSOP Projects
- Emergency Vehicle Preemption workshop
- Study to Develop a Methodology for Evaluation of New Traffic Detectors
- ARID workshop
- Recap of Arizona TSMO Summits

2. Review and approve minutes of the meeting held on June 5, 2019.

3. For information.

4. For information and discussion.

5. TIP Call for Projects, Overview of the SM&O Competitive Project Application Form and Evaluation Process

On August 26, 2018, the MAG Regional Council approved the Systems Management and Operations Plan (SM&O), allocating approximately \$80 million of regional sub-allocated federal aid to specific project areas for Phase I of the Plan for FY2020-2024. The MAG Call for Projects is expected to be released in late July to program new projects in the TIP, including qualifying ITS projects for FY2020-2022. An overview of the project application form, application guidelines and planned timeline will be presented.

6. SM&O Project: Static Detour Wayfinding at All Intersections along Specified Detour Routes

A Phase I strategy in the SM&O Plan, funded for program years FY2020-2024, calls for the installation of static detour wayfinding signs on arterials within ICM corridors. Static wayfinding strategies would be dependent upon the completion of ICM corridor plans identifying detour routes.

The committee will discuss the option to defer the static wayfinding strategy until the FY2023-2024 TIP Call for Projects, in anticipation of completed FY2020-2022 ICM plans for ICM corridors.

7. Regional ITS Architecture Update

The 2019 update to the Regional ITS Architecture will provide comprehensive documentation of the existing and future plans for the ITS infrastructure, systems

5. For information and discussion.

6. For information and discussion.

7. For information and discussion.

and agency responsibilities for ITS functionality within the MAG region.

A stakeholder outreach, including stakeholder surveys, interviews and a training workshop, has been completed to identify changes or updates based on ITS activities and initiatives that have occurred or are planned for the region since the 2013 update. A technical memorandum has been prepared summarizing the findings from all outreach efforts and identifies the nature of the updates and changes to be addressed in the Regional ITS Architecture update. In addition, a Communications White Paper is being developed to provide a strategic direction for developing a regional communications system that supports ITS activities. An update of the latest findings and upcoming project activities will be provided to the committee.

8. Reports by Committee Members

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

9. Request for Future Agenda Items

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

10. Next Meeting Date and Place

The next meeting is scheduled to be held at 10:00 a.m. on Wednesday, August 7, 2019. It will be held in the Ironwood Room on the 2nd Floor of the MAG office building.

11. Adjournment

8. For information and discussion.

9. For information and discussion.

10. For information.

11. Motion to adjourn.

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

June 5, 2019

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

MEMBERS ATTENDING

Chris Hamilton, City of Avondale (Chair)	# Rob Dolson, City of Maricopa
Susan Anderson, ADOT	Tricia Boyer, City of Mesa
Raquel Schatz, City of Apache Junction	Steve McKenzie, City of Peoria
# Yingyan Lou, ASU	Bruce Littleton, City of Phoenix
John Willett, City of Buckeye	Scott Nodes, Pinal County
* Srinivas Goundla, City of Chandler	* Mohamed Youssef, Town of Queen Creek
* Sergeant Stuart McGuffin, DPS	Hong Huo, City of Scottsdale
Tessa Wessel, City of El Mirage	Albert Garcia, City of Surprise
Mike Sutton, Town of Gilbert	David Lucas, City of Tempe
* Allan Galicia, City of Glendale	Steve Chayt, Valley Metro
Luke Albert, City of Goodyear	
Barbara Hauser for Nicolaas Swart, Maricopa County	

EX-OFFICIO NON-VOTING MEMBERS ATTENDING

Toni Whitfield, FHWA

OTHERS PRESENT

Russell More, Horrocks	Marshall Reigel
Don Wiltshire, YSMA	Michelle Beckley, Y2K Engineering
Michael Washkowiak, Iteris	Heather Wilkey, Town of Queen Creek
Andy Murray, AECOM	Ravi Ambadipudi, Burgess & Niple
Amy Wyman, Burgess & Niple	Nick Fatica, United Civil Group
Dave Chambers, TransCore	Sarah Simpson, United Civil Group
Scott Kelley, Greenlight Traffic	Ryan Gish, MAG
Deanna Haase, Kimley-Horn	Teri Kennedy, MAG
Jay Yenerich, CivTech	Jeff Jenq, MAG
Simon Ramos, City of Phoenix	Margaret Herrera, MAG
Yan-Jan Wu, University of Arizona	Eric Nava, MAG
Don Tappendorf, Stanley	Lan Jiang, MAG
Tomas Guerra, OZ Engineering	Mohammad Shaheed, MAG
Cory Steele, Strand	

* Not present or represented by proxy

Participated by teleconference

+ Participated by videoconference

1. Call to Order

Chair Chris Hamilton called the meeting to order at 11:02 a.m. and conducted introductions.

2. Approval of the Minutes from ITS Committee meeting held on May 15, 2019

Chair Hamilton requested approval of the meeting minutes from the May 15th ITS Committee meeting. **Bruce Littleton with City of Phoenix moved, David Lucas with City of Tempe seconded, and it was unanimously carried to approve the minutes of the meeting held on May 15, 2019.**

3. Call to Audience

Chair Hamilton 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. Staff Report

Chair Hamilton invited Jeff Jenq with MAG to present the Staff Report. Mr. Jenq addressed the following items in the report:

➤ FY2019 TSOP Project Update

The ten projects for FY2019 are underway. Completion of projects will be June 30, 2019, with the exception of two projects that have been amended to be completed in December 2019 due to an unexpected closure that affected traffic counts. The 3-day Synchro training workshop has been scheduled for June 26-28, 2019, at the MCDOT computer training facility. Mohammad Shaheed with MAG provided an update to the training. Mr. Shaheed stated that there were seats still available after reaching out to member agency staff to attend the training. The remaining seats will be filled by ADOT staff that requested additional seats for attendance.

➤ FY2019 Regional ITS Architecture Update

The project is underway to update the current MAG Regional ITS Architecture to the current web-based implementation of the Regional ITS Architecture to be consistent with the latest version of the National ITS Architecture that is referred to as the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) Version 8.1, as well as integrate architecture updates from local agencies since 2013, prepare the architecture for upcoming ITS programming in FY2020-2022, and develop a Communications White Paper.

An introductory workshop was held on May 16, 2019. A brief review of what the Regional ITS Architecture is, why it is important to the region, and the tools to be used for the update were presented. Copies of member agency service packages were distributed at the workshop to review and discuss service package changes to individual agencies since 2013. The agencies were given time to review and provide feedback on proposed change. The workshop also discussed a stakeholder survey and stakeholder interview process that will be conducted to collect input for the update. Stakeholder surveys have been distributed to all member agencies to provide that will provide feedback to update the architecture. Eric Nava with MAG provided an update and asked that all survey and comments be returned by Thursday, June 6.

- FHWA TMSO Capability Maturity Model (CMM) Workshop
A CMM workshop was held at MAG on May 14, 2019. The workshop was organized by Toni Whitfield of the FHWA Arizona Division Office, in coordination with ADOT, MCDOT and MAG. The objectives of the workshop were to provide a self-assessment tool to advance TSMO within an agency and the region, to have an opportunity for participants to share challenges and successes related to TSMO, and to contribute to the regional and state assessment of TSMO plans and activities. Twenty-seven attendees from sixteen jurisdictions attended the workshop. Six dimensions of TSMO process areas were used for the self-assessment, which include business processes, system and technologies, performance measures, culture, organization and workforce, and collaboration. Based on the previous CMM workshop in 2014, agency self-rating scores improved for individual jurisdictions.
- Arizona TSMO Summits
A reminder was given regarding two upcoming TSMO Summits. The first is an Executive Summit, intended for executive-level decision makers at local jurisdictions, will be held on June 18, from 1:00-5:00 p.m. at the ADOT HRDC building. The objective is to inform decision makers of the benefits and needs of TSMO. The second is a two-day Technical Summit being held on June 19-20 from 8:30 a.m. – 4:30 p.m. at the ADOT HRDC building. The objective of the Technical Summit is to collaboratively share information and ideas for the region, as well as a peer exchange with other regions that have employed ICM initiatives. Invitations for both Summits have been sent to those agencies that showed interest in attending.
- Recognition of Outgoing Committee Chair
The outgoing ITS Committee Chair, Chris Hamilton with City of Avondale, has served from January 2017 to June 2019. David Lucas with City of Tempe, is the incoming Chair and will begin at the July ITS Committee meeting. The incoming Vice Chair will be Steve McKenzie with City of Peoria. A certificate of appreciation was presented to Chair Hamilton in recognition of his contributions to the ITS Committee.

5. Overview of the CMAQ Methodology for Evaluating Proposed Intelligent Transportation Systems Project Applications

Chair Hamilton invited Jeff Jenq with MAG to introduce the item. Mr. Jenq stated that the upcoming TIP Call for Projects would include federal Congestion Mitigation and Air Quality Improvement (CMAQ) funding for ITS programmed projects. One of the required elements for project evaluation includes an air quality score, which assesses a project's expected emissions reduction benefit and cost-effectiveness. Dean Giles, Air Quality Planning Project Manager with MAG, was invited to present an overview of the MAG CMAQ methodology for evaluating proposed ITS projects. The CMAQ Program continued under the Fixing America's Surface Transportation (FAST) Act. The purpose of the program is to fund transportation projects and programs that will contribute to attainment or maintenance of the federal air quality standards for ozone, carbon monoxide, and particulate matter (PM-10, PM-2.5). The FAST Act continues requirement for MPOs to give priority to cost-effective projects. FHWA published Interim Program Guidance on November 12, 2013. Eligible activities include: traditional traffic flow

improvements and ITS projects such as traffic signal synchronization, intersection improvements, traffic management, traveler information systems, and freeway management systems. Proposals for CMAQ funding should include a precise description of the project (e.g. information on its size, scope, location, and timetable). Assessment of the project's expected emission reduction benefits and cost-effectiveness should be completed prior to project selection to better inform the selection of CMAQ projects. MAG CMAQ Methodologies, first published in 1999, was last updated in September 2011. In 2010, MAG contracted with Lee Engineering and Texas Transportation Institute to update methodology for evaluating proposed ITS projects. The methodology quantifies proposed project emission reductions in kilograms per day. The cost-effectiveness for project in dollars per metric ton of emissions reduced annually. Emissions benefit calculations include reductions in carbon monoxide (CO), volatile organic compounds (VOC), nitrogen oxides (NOx), and particulate matter (PM-10) emissions in kilograms per day. The methodology applies the EPA-approved emissions model MOVES2014b to obtain emission rates. Emission rates are calculated for the first year that the project is implemented.

Emission reductions occur when ITS improvements reduce vehicle delay or increase speeds. The project application provides inputs to the emission reduction calculation, including CMAQ funding requested, length of project in miles, average weekday traffic, pre-project speed, and post-project speed based on the improvement. Elements are typically implemented over a period of years in the TIP. MAG ITS Program staff will assign elements to the appropriate project group. A project group consists of individual elements in a common geographic area. Elements are analyzed as one project and emissions benefits from the element with the maximum benefit within the project will be allocated to elements in the same project group based on vehicle miles of travel.

For other ITS projects, such as the Freeway Management System (FMS), projects improve traffic flow and reduce vehicle idling. The project application provides inputs to the emission reduction and cost-effectiveness calculation, such as CMAQ funding requested, length of project in miles, and whether the project includes ramp metering. The methodology will calculate emission reductions (CO, VOC, NOx, PM-10) associated with FMS projects based on: estimate vehicle miles of travel (VMT) affected by congestion based on MAG Travel Demand Model traffic assignments for project year, assume weekday and weekend speeds from MAG 2011 Speed Study and 2011 MAG Non-Recurring Congestion Study, use MOVES2014b emission rates for freeway speeds, sum the emissions reductions associated with the project for peak and off-peak periods for recurring, non-recurring, and weekend congestion, and calculate Capital Recovery Factor and Cost-Effectiveness.

Mike Sutton with Town of Gilbert asked if arterial traffic signals are included in the calculation related to freeway interchanges if coordinated. Mr. Giles replied that the arterial and freeway systems are usually calculated separately because freeway calculations are considering the speed of the freeway mainline only. Bruce Littleton with City of Phoenix added that the original intention of ramp metering was to improve the speed and efficiency of the freeway mainline, but newer ramp metering logic is looking to coordinate with crossing arterials to provide more benefit.

6. SM&O TIP Project Schedule

Chair Hamilton invited Teri Kennedy, Transportation Improvement Program Manager with MAG, to speak to the item. Ms. Kennedy provided an update to the programming schedule outlined for the programming of Phase I strategies of the SM&O Plan. Modifications to the programming schedule since presented in the last ITS Committee meeting. The project overviews for non-competitive projects that were recommended by the committee on May 15 were moving through the approval process to be added to the MAG TIP. The two project overviews that were pulled from the original list to be revised will be resubmitted for review on June 21 and be posted to the MAG webpage for review by the Committee. The revised project overviews will be presented to the committee at the July 10 meeting. Committee members will submit evaluation scores of the revised project overviews by July 19, and the evaluation scores will be presented to the committee on August 7 for recommendation to be added to the MAG TIP. The project overviews will then go through the MAG Committee approval process to be added to the MAG TIP.

The Call for Projects for competitive ITS projects will be issued, along with the TIP Programming Guidebook, within the July 31 or August 1 timeframe. MAG will hold a Federal Fund Project Application Workshop on August 6. Project applications will be due on September 16 by 10:00 a.m. On September 19, the project applications will be posted on the MAG TIP webpage and a notice will be sent to the committee to download the applications and evaluation form to begin reviewing and scoring project applications. A special ITS Committee meeting will be held on October 16 and 17 for committee presentations of project applications. A second day is will be planned for the continuation of project presentations in anticipation that a large number of projects will be submitted. On October 23, the project evaluation scores from committee members will be due. At the November 6 ITS Committee meeting, the committee will review any additional modifications to applications that needed clarification or fixes, but this is not an opportunity for modify the application for a different function or purpose. At the January 8 ITS Committee meeting, all evaluation scores, including air quality, quantitative and qualitative scores, and the committee will review the summary of scores and recommend the priority listing of projects to be added to the MAG TIP. The listing of projects will proceed through the MAG committee process for approval of programming the projects to the MAG TIP.

7. City of Tempe Streetcar Traffic Signal Priority Project

Chair Hamilton invited David Lucas with City of Tempe to speak to the item. Mr. Lucas would provide an update to the City of Tempe Streetcar project, specifically focusing on transit signal priority (TSP) with real-time tracking, which is currently under construction. The streetcar route will be a three miles through the City, with fourteen sheltered stops and two light rail connections. The streetcar will be powered by a hybrid battery, and will be off-wire through the downtown area on Mill Avenue. The streetcar fleet will have six vehicles with a capacity of approximately 125 passengers and will be ADA and bicycle accessible. The capitol cost for the project is approximately \$200 million. Funding sources include a federal grant, regional funding through Proposition 400, and the City of Tempe local public-private partnerships. The status of the project for the project is at 100% design. The rail has been delivered and welded. Construction of the rail began in November 2018. The streetcar is scheduled to open in 2021.

A few portions of the alignment will have dedicated guideway for the streetcar. However, much of the streetcar alignment will be shared lane with mixed traffic. The specifics of the mixed traffic alignment would be important in terms of the use of TSP and deciphering the difference between regular vehicle and the streetcar. The streetcar rail is currently under construction, including downtown closures scheduled to remain closed through the mid-August, but construction is ahead of schedule and may re-open closures sooner. Construction on streetcar stops and artwork are anticipated for late 2019. Operations training and vehicle testing are scheduled for 2020, and opening and operation of the system is anticipated to begin in 2021.

ITS needs for the Tempe streetcar were outlined, including fiber communications, vehicle detection, CCTV monitoring, and TSP with real-time tracking. The ITS needs were funded via two City of Tempe capital improvement projects of \$1 million for fiber communications and \$1.2 million for the remaining ITS needs. A list, but not an exhaustive list, of TSP system requirements included virtual detection zones, priority requests based on multiple criteria, accurate real-time GPS-based tracking, wireless non-line of sight (NLOS) communication, monitor the battery's state of charge (SOC), support of existing EVP infrastructure and flexible hardware/software that would include support for silent alarm capabilities and export ETA data in standard formats.

EMTRAC was the system that was selected for the TSP via RFP and was awarded the contract in April 2019. The EMTRAC system eliminates the need for embedded loops in the trackway. Virtual detection zones, which are defined by GPS coordinates, allows system data to be sent only when pre-defined conditions (such as position, speed, heading or SOC) are met. A flexible advantage of virtual detection zones is having the capability to create different sized zones by time of day, for instance, during peak periods to have more advanced notice of the streetcar approaching in congested conditions. The onboard equipment will include one vehicle computer unit (VCU) and RF/GPS antenna per cab. The VCU requires power, speed sensor, ignition sensor, battery SOC, silent alarm, and other capabilities. The RF/GPS antenna is mounted on the roof, with unobstructed line of sight (LOS). A question from Jeff Jenq with MAG was asked regarding wireless communication with the vehicle. Mr. Lucas replied that the system includes 900MHz frequency hopping spread-spectrum (FHSS) radio on the wayside equipment that can communicate with the radio on the streetcar vehicle and is expected to provide constant communication with the vehicle. This equipment is for consideration in areas, such as downtown, that NLOS may be an issue. The wayside equipment includes the priority detector in the signal cabinet with Tx/Rx data and communicates with the signal controller, an omni-directional antenna that is mounted at fifteen feet or higher and the near signal cabinet and existing EVP detectors that can be wired in and accepted as inputs. The EMTRAC system tracks vehicle positions and progress as they travel through their routes. As vehicles move along these routes, they enter pre-defined virtual detection zones and transmit data via secure 900 MHz FHSS radio to appropriate wayside equipment.

All streetcar vehicles will be housed in the Operations and Maintenance Center (OMC), similar to the light rail vehicles. The route to the OMC will be the same alignment as the light rail until the streetcar reaches the junction at Dorsey Lane and Apache Boulevard streetcar stop. Once

off the light rail alignment, operations will be switched over from the light rail communication system to the EMTRAC system. There will be Valley Metro equipment and systems installed for coordination purposes, such as system sharing and the switching yard at the OMC for firmware updates and downloading data logs. The Valley Metro OCC will have full access to the EMTRAC Central Control Center system that will be installed at the City of Tempe TMC for visibility and monitoring purposes. Valley Metro will be responsible for onboard equipment maintenance. Other components, such as support for silent alarm functionality, vehicle location data/ETA data export and other enhanced capabilities in future.

The current status of the project includes coordination with Brookville Electric, the streetcar manufacturer, for installation of onboard equipment. The first vehicle will be due in April 2020. There will be an amendment of the existing Valley Metro O&M agreement. The City is currently transitioning from the demonstration system to the actual EMTRAC system. This includes setup of the EMTRAC Central Control Center, installing wayside equipment and connectivity between City of Tempe TMC and Valley Metro OCC.

Mike Sutton with Town of Gilbert asked who would be responsible for rail operations and maintenance. Mr. Lucas replied that onboard vehicle equipment and with the guideway will be the responsibility of Valley Metro, while wayside equipment and EMTRAC system servers will be the responsibility of the City of Tempe. This is part of the amendment of the Valley Metro O&M agreement. Mr. Jenq asked about the use of the EMTRAC system, specifically the capability of EVP integration. The City of Glendale recently installed EMTRAC for the use of EVP operations. Mr. Lucas replied that part of the data gathering process was demonstrating the EMTRAC system downtown for EVP operations, which included a downtown fire station. The demonstration would preempt two potential traffic signals in either direction of the fire station when the emergency vehicle departed the station. The emergency vehicle could communicate with downstream traffic signals to continue preemption in the direction of the vehicle. The system is a distributed system, so the communication occurs between the VCU on the vehicle and the control unit at the traffic signal controller. In the future, the City of Tempe will look into transition to this EVP system for the rest of the City.

8. Reports by Committee Members

Chair Hamilton called on members to report items of interest to the committee.

Tricia Boyer with City of Mesa reported the last mile installation of the latest light rail extension is operational. The City has extended the deployment of the EMTRAC system to two additional intersections.

Hong Huo with City of Scottsdale reported on the kickoff of a citywide fiber audit project, anticipated to be complete within nine to twelve months.

Susan Anderson with ADOT reported that George Williams has accepted the position of Operational Traffic and Safety Section Manager, which leaves a vacancy of the Systems Management Section Manager position.

Bruce Littleton with City of Phoenix reported on the delay of the traffic signal detection system testbed. The delay has been due to a City Water Department project involving maintenance of a water main along a stretch of Indian School Road, directly located where the testbed has planned. The City has still pledged its commitment to creating the testbed for the purpose of testing detection equipment, in particular, for a current MAG project that was expected to use the testbed.

9. Request for Future Agenda Items

Chair Hamilton called on members to request future agenda items. There were no requests. Any future requests should be provided to MAG staff.

10. Next Meeting Date and Place

Chair Hamilton announced that the next meeting will be held at 10:00 a.m. on Wednesday, July 15, 2019, in the Ironwood Room (2nd floor) at MAG.

11. Adjournment

Chair Hamilton called for motion to adjourn the meeting at 12:17 p.m. Scott Nodes with Pinal County moved, David Lucas with City of Tempe seconded, and it was unanimously carried to adjourn the meeting.