MINUTES OF THE
MARICOPA ASSOCIATION OF GOVERNMENTS
INTELLIGENT TRANSPORTATION SYSTEMS COMMITTEE

September 3, 2014
MAG Ironwood Room, 2nd Floor
302 North First Avenue
Phoenix, Arizona

MEMBERS ATTENDING

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

OTHERS PRESENT

Joey Paskey, Atkins
Lisa Burgess, KHA
Jeff Jenq, OZ Engineering
Dan Hartig, Ayres Associates
Jothan Samuelson, Wilson
Corey Steele, Strand
Jim Lee, Lee Engineering
Mike Cynecki, Lee Engineering
Don Wiltshire, YSMA
Don Tappendorf, TEC
Krishna Anantuni, PB
Margaret Boone, MAG
Ryan Gish, MAG
Micah Henry, MAG
Sarath Joshua, MAG
Teri Kennedy, MAG
Eric Nava, MAG

* 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 August 6. 2014 Meeting Minutes

   The minutes were corrected to identify Bryce Christo as representing the City of El Mirage. **Chris Lemka from Buckeye moved, Reza Karimvand from ADOT seconded and it was unanimously carried to approve the minutes of the meeting held on August 6, 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

Mr. Sarath Joshua from MAG addressed the following items in his report:

- Current Status of TSOP Projects:

  A total of 11 TSOP projects, three have been completed, seven projects are underway, and one project is about to begin. Regarding the TSOP projects scheduled for fiscal year 2015, the selection criteria from the previous year will be used. The call for projects is announced with applications due by September 30, 2014. A special meeting is scheduled on October 7th to take action on a recommendation for selected projects to advance the projects to additional committee meetings. The goal is to obtain approval for the TSOP projects by the December Regional Council meeting. The task orders for the projects will be finalized by February 2015. The special meeting is necessary to meet the time line for approval such that it can be presented to TRC. MAG will contact participants to ensure representation at the special meeting is adequate.

- Workshop on Integrating Planning for Operations

  Sarath Joshua requested Toni Whitfield to provide a summary of the FHWA Planning for Operations Workshop held on August 25th and 26th at MAG. She stated that the purpose of the workshop was to equip planners and operators to integrate system operations into the metropolitan planning process using an objectives-driven, performance-based approach consistent with MAP-21. The workshop agenda included performance measures, programming for operations, monitoring, evaluation, analysis tools, and benefit-cost analysis. The workshop included a peer exchange; Alex Estrella of SANDAG presented on the I-15 National ICM Pilot Project with a large concentration of automation.

- Pilot Project to Co-locate of DPS Officers at the TOC

  Sarath Joshua reported that the MAG Regional Council approved to fund the pilot project on August 27th to co-locate DPS officers at the ADOT TOC, to be equally funded by MAG and ADOT. MAG and ADOT are working on finalizing the funds for the pilot project. As per request from the MAG Management Council, the project includes an evaluation component where MAG will coordinate with DPS and ADOT to establish a data archive for TIM metrics based on best practices. MAG will utilize archived data to produce an annual report on Freeway Traffic Incident Management. MAG will also perform a comparison of freeway operations "before" and "after" the DPS co-location project to identify potential benefits. If the pilot project proves successful it will be reviewed as a potential inclusion in the regional strategy to be funded through the RTP. Reza Karimvand stated that the pilot program will be evaluated to identify the regional benefits with potential for future funding from multiple sources.

- Proposal to FHWA on SHRP2 L04 Pilot Project – Incorporating Reliability in Operations & Planning Modeling Tools

  Sarath Joshua provided a brief description of a recent proposal submitted to FHWA, in which MAG participated as a team member, for a pilot project to test key research products from the L04 project in the SHRP2 Reliability Program. The SHRP2 L04 project developed a methodology to produce reliability performance metrics from planning models. Kittelson & Associates will lead the proposed study team to assess the two primary features of the SHRP2 project: the scenario generator and the trajectory processor. Other members of the study team include MAG, Portland METRO, Dr. Yi-Chang Chiu of

University of Arizona, Dr. Xuesong Zhou of Arizona State University, and Kiel Ova. The pilot project proposal includes the use the MAG Dynus-T model enhanced by the features resulting from the SHRP2 project to evaluate the Spine I-10/I-17 Corridor Master Plan for travel time reliability improvements. This pilot project is pending selection. The current travel demand model (TDM) does not simulate impacts due to weather, construction zones, or non-recurring events. This SHRP2 project uses scenarios that represent these potential non-recurring events to review travel time reliability in the model. By tracking the movements of the individual vehicles in the model, the results identify travel time variations due to the anomalies. Kittelson will be leading the effort for the study with MAG providing support through the Dynus-T model effort. Faisal Saleem identified available data in RADS as well as the ADOT HCRS. Sarath acknowledged that both these data sources as well as ALISS crash data were proposed to be utilized in the pilot project.

- ITS Arizona Conference

  Sarath Joshua mentioned the upcoming ITS Arizona Conference at Mesa Convention Center on September 24th and 25th. Multiple regional projects are included in the program for presentation.

5. Emergency Vehicle Preemption (EVP) Study

Chair Hollow invited Micah Henry from MAG to provide a status update on the EVP Study. Mr. Henry introduced Jeff Jenq with OZ Engineering to present the project to the committee. Mr. Jenq presented the study scope and identified the progress. The goal of EVP is to allow emergency vehicles to preempt the signal timing to proceed safely through instrumented signalized intersections. The five tasks of the study include to identify existing regional EVP operations, equipment, and personnel; to identify operations challenges and shortcomings, to research and review current EVP technologies; to document EVP best practices; and to provide recommendations for improving EVP in the MAG region. Tech memos will be drafted for the tasks to be presented to the study's Technical Advisory Committee.

Mr. Jenq reviewed the history of EVP in the MAG region. The initial preemption system relied on infrared technology and was deployed locally in the early 1980s. To protect the system users, technology was upgraded to include coding capability. Technology advances in the mid-1990s included GPS-based EVP. To help facilitate regional coordination with regards to EVP, the East Valley EVP working group formed several years ago including Chandler, Gilbert, Mesa, and Tempe. Currently GTT technologies are deployed in 19 jurisdictions and Tomar technologies are deployed in 14 jurisdictions.

Regional coordination opportunities include encoding preemption transmitters, preemption signal phasing and operations, use of confirmation lights for EVP status, and the detection range setting. Current practices include two different preemption signal phasing strategies: the first is the approach receiving a green indication in conjunction with the opposing through movement; the second is the approach receiving a green indication for both the through and left turn movements, while all other movements have a red indication. There are preferences for either strategy depending on the participating agencies. These strategies will be reviewed for best practices.

Another challenge for preemption is the speed of the responding emergency vehicles. Fire department engines typically travel 5 to 10 mph above the posted speed limit. Police

department vehicles typically travel 20 to 30 mph above the posted speed limit. The signal response to the EVP request can vary greatly depending on the vehicle requesting preemption. The higher approach speeds of police vehicles have cause apprehension for traffic engineers responsible for programming the traffic signal controllers in preemption mode. Some agencies are reviewing preemption capabilities of police departments. This challenge will also be reviewed for best practices.

The current two competing technologies for EVP are optical and GPS/radio. The optical strategy uses infrared light where there approaching vehicle actuates EVP at a fixed distance with a direct line of sight. There is no on-board feedback for optical preemption. The GPS strategy uses radio to continuously calculate the location of the vehicle which includes on-board confirmation.

The goals include a comprehensive review of current EVP practices, identification of best EVP practices, and recommendations for practices in the MAG region. The EVP best practices criteria for peer regions include deployment across multiple jurisdictions, multiple users, policy coordination on phasing and coding, regional encoding scheme, funding for equipment and maintenance, analysis of usage (actuation) data, and maintenance practice.

Reza Karimvand identified the need to differentiate the terminology between preemption and priority. He stated that transit should not use pre-emption equipment and should only utilize the technology for traffic signal priority. The inclusion of discussion of transit priority technology will only be supplemental in nature in the report. Transit priority will not be included in the discussion for emergency vehicle preemption. The report will mention that the same equipment is used for both priority and preemption.

6. Identifying Arterial ITS Needs in FY2018 and Beyond

Chair Hollow invited Sarath Joshua to discuss the identification of arterial ITS needs in the future. Mr Joshua explained that in 2003 a total of $50 million was allocated in the RTP for Arterial ITS projects. These funds have been fully programmed through FY2017. MAG is now exploring funding options to continue programming arterial ITS projects in FY2018 and beyond. One of the options being reviewed is to utilize the $37.5 million in regional funds left after FMS coverage approved in the RTP has been completed.

Mr. Joshua mentioned that ITS Committee members have been contacted via email to solicit feedback on potential arterial ITS projects for the period FY2018-FY2027. The purpose is to generate an estimate for the need for arterial ITS improvements for the ten-year period. The information requested includes a project summary, the year of anticipated deployment, and the estimated cost. This information will be used in the discussion at the TRC on addressing future funding needs for arterial ITS.

Mr. Joshua invited Teri Kennedy, MAG TIP Program Manager, to further explain the process. Ms Kennedy explained that the current effort is to identify and estimate the existing needs of member agencies. She stated that the current FMS programming has resulted in cost savings. With the initial grouping of projects for the FMS concluding in the next several years, additional needs for the FMS that are beyond the current RTP programming would also be reviewed. The choices will be presented to the TRC Committee to identify the highest needs for the available funding with respect to a

balance program going forward. Also being explored are future opportunities for coordinating ITS on the freeways with the arterials.

With regards to arterial ITS needs versus available funding, the current guidance is based on the MAG ITS Strategic Plan developed in 2012 that identifies focus areas including ICM and ITS for safety. Member agencies should identify arterial ITS needs under the guidance of the regional ITS Strategic Plan. The goal is to identify the needs as well as the resources available for funding the needs. Currently there is no funding source for investing in arterial ITS beyond 2017. Ms Kennedy stated that FHWA has recently provided planning guidance to MAG highlighting the need to address both recurring and non-recurring congestion in the region.

Arterial ITS infrastructure needs identified by the member agencies will help MAG establish regionwide infrastructure needs as input to decision making on future funding. This list of projects will be evaluated along with proposed projects for expansion of the FMS coverage.

Mr. Joshua reminded the committee that the list of individual agency projects should be provided to MAG by Friday, September 5th for the purpose of the estimating arterial ITS infrastructure needs. Although the list is preliminary in nature, it should be based on upcoming CIP projects. He requested that the project needs be identified by fiscal year for the ten-year period.

7. Traffic Operations & Technology Solutions for Improving Road Safety

Chair Hollow invited Margaret Boone to present the agenda item on traffic operations and technology solutions for improving road safety. Ms Boone explained that MAG is currently in the process of developing an update to the 2005 Strategic Transportation Safety Plan. This Plan will develop goals, strategies, and performance measures, and would help facilitate MAG member agency efforts to address regional road safety issues. One of the tasks in the Plan includes improving road safety via traffic operations and technology solutions. This also corresponds to a similar goal in the 2012 ITS Strategic Plan.

Jim Lee and Mike Cynecki, with Lee Engineering LLC, were introduced to the committee and went on to present this topic. Mr. Lee explained that the goal of this task is to inform a vision for deploying traffic operations and technology solutions to improve road safety. The purpose is to review proven infrastructure-based technology applications for reducing conflicts and improving road safety. This includes mid-block crossings with beacons and illumination, emergency vehicle preemption, connect vehicle development, safer work zones, active traffic management, and wrong-way driver technology. A Draft Technical Memorandum with findings has been developed and is available at the MAG website.

Mr. Lee explained some of the findings. The pedestrian hybrid beacon (HAWK) uses a crossing treatment which improves pedestrian safety while minimizing vehicle delay. The 2009 MUTCD, which Arizona adopted in 2012, includes warrants for installing the HAWK beacon. Studies that compared “before” and “after” crash statistics have indicated a 69 percent reduction in pedestrian crashes as well as a 29 percent reduction in total crashes. A modified crossing treatment called the Puffin allows longer pedestrian clearance intervals using presence detection. The Rectangular Rapid-Flashing Beacon

(RRFB) uses an eye-catching flash stutter sequence to draw drivers' attention to warning signs and pedestrians. This device has increased the driver yielding right of way to pedestrians from 72to 96 percent.

Pedestrian crossing islands and two-stage islands allow for pedestrians to cross one direction of traffic at a time. Medians with this deployment experienced a 56 percent reduction in pedestrian crashes. The two-stage Pedestrian Hybrid Beacon (Double HAWK) combines the hybrid beacon with two-stage islands for crossing.

The uses of road illumination technologies were also reviewed. As introduced in the FHWA Lighting Handbook, a newer design places lighting in advance of the crosswalk as opposed to directly at the crosswalk. This illumination technique was shown to improve visibility of pedestrians and safety of crosswalks. Also reviewed were "Smart lighting" using pedestrian presence detection to activate LEDs (adaptive lighting) in the crosswalk to draw attention to a crosswalk that is in use.

Midblock Bicycle Crossing (BikeHAWK) uses special treatments required for bicyclists. This design moves bicyclists to cross one side of the road, separating bicycles and pedestrian travel paths in the crossing. This eliminates the "late entry" of bicyclists into the crosswalk. FHWA has established an interim ruling allowing for the use of bicycle signals. This is being developed for the next update of the MUTCD. This design uses active detection via bicyclist push buttons. Passive detection is also being used as in-pavement loops, radar, video, and microwave detection. Minimum green times will also be required for bicycle signals.

Connected vehicle safety applications include Vehicle-to-Infrastructure (V2I) and Vehicle-to-Vehicle (V2V) technologies. V2I includes red light violation, STOP sign gap assist, curve speed warnings, and reduced speed/work zone warnings. V2V includes forward collision warning, left turn assist, and blind spot/lane change warning. The USDOT is conducting a safety pilot project in Ann Arbor, Michigan for Connected Vehicle technologies.

New technologies are also being used in work zones to improve safety, including rapid bridge replacement, safety edge resurfacing, barrier innovations, work zone ITS (WZ ITS), variable speed limits, sequential warning light systems, portable work zone rumble strips, portable traffic signals, and automated flagger assistance devices (AFAD).

Active Traffic Management (ATM) technologies include adaptive ramp metering, adaptive traffic signal control, dynamic junction/interchange control, dynamic lane reversal/contraflow lane reversal, dynamic land use control, dynamic merge control, dynamic shoulder lanes, dynamic speed limits, queue warning detection, and transit signal priority. Attributes for a successful ATM project include: educate customers and policy makers, provide real-time, accurate communication, technological capability, ensure flexible laws for accommodation, and effective communications at every stage of the project.

Wrong-way driver technology is also becoming more important. An average of 30 crashes per year with 11 fatalities have recently occurred in Arizona, and 350 annual wrong-way fatalities occur in the U.S. The Arizona DOT commissioned a study that produced the Wrong-Way Vehicle Detection: Proof of Concept Final Report in 2013.

This report evaluated detector systems to identify entry of wrong-way vehicles. In 2014 ADOT installed large static STOP signs in lower positions at 6 interchanges, as an interim measure. There is on-going ADOT research for a statewide wrong-way detection system. ADOT is currently preparing a scope of work for this effort, specific for direct, practical implementation.

The Draft Tech Memo No. 7 is available at : http://azmag.gov/Documents/STSP_2014-09-02_Tech-Memo-7_Improving-Safety-via-Traffic-Engineering-and-Technology-Solutions.pdf
It is currently being reviewed. Comments should be submitted by September 18th to Margaret Boone. This Tech Memo will provide input to the Implementation Plan. Member agencies were requested to identify other technology deployments for road safety improvements that could be included in the Tech Memo.

8. Reports by Committee Members

Chair Hollow called on members to report items of interest to the committee. Chair Hollow invited Ryan Gish from MAG to give an update on the RCN Working Group and latest RCN developments. Mr. Gish detailed the Working Group's discussion regarding network update, including firmware updates on the RCN switches throughout the MAG region. The core switches are complete and the focus will be on the outlying switches later this month. The estimated down-time is one to three minutes. Mr. Gish will be coordinated with those local agencies affected by the updates.

MAG has been providing network support based on member agency requests. Member agencies that recently received assistance include Chandler and Buckeye. The cities of Tempe, Gilbert, and Surprise will be provided assistance next. He reported that the RCN Working Group also discussed the Video Management Software Pilot, making progress on exploring the video sharing options. MAG will be working with the local TMCs to test video-sharing capabilities. MAG will be soliciting feedback from those agencies. Regarding the Regional Fiber Mapping Project, MAG solicited conduit and fiber information to be included in the project for those that would like to be involved. An attachment included the Terms of Use and Account Request Form for individual users.

Chris Lemka reported that the City of Buckeye successfully deployed ITS with the assistance from Ryan Gish with MAG and Albert Garcia with Surprise to establish video via CCTV camera. For communications, radio was used to deliver data back to the city. Video was established at a critical intersection through a coordinated, regional effort.

Ratna Korepella with Valley Metro announced her new position with the City of Scottsdale and she will no long be attending ITS Committee meetings. Reza Karimvand reported ADOT's efforts on the DMS Travel Time Expansion Project encompassing I-10 and I-17. The I-10 component includes three morning peak hour travel times and 13 afternoon peak hour travel times. The I-17 component includes three morning peak hour travel times and seven afternoon peak hour travel times. It is anticipated that all three phases of the Travel Time Expansion Project will be completed by December 2014.

Nicolaas Swart with MCDOT updated the committee on the AZTech Strategic Task Group meeting and the coordination effort between the committees on implementation of projects. A meeting will be held to address these opportunities. Ron Amaya with Peoria stated that the city received federal aid for the ITS equipment upgrade project. This will

upgrade traffic signal controller cabinets on Olive, Peoria, and Northern, and the project will be administered by ADOT. Faisal Saleem stated that the travel time effort is also being conducted on the Bell Road corridor. MCDOT has also finalized the scoping for the Bell Road Adaptive Signal Control Project. The design is anticipated to be completed by June 2015.

9. Request for Future Agenda Items
There were no requests for future agenda items.

10. Next Meeting Date and Place
Next meeting date was announced at 10:00 a.m. on Wednesday, October 1, 2014, in the Ironwood Room (2nd floor) at MAG.

11. Adjournment
Chair Catherine Hollow adjourned the meeting at 11:45 a.m.