MAG Systems Management & Operations Plan

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Travel Time Reliability through Systems Management & Operations

- Why develop SM&O
- SM&O focus on Operations
- Implementation

- Key Tasks
- Lessons Learned
Why develop a SM&O Plan?

Targeting regional funding resources toward high-priority investments identified in the SMO Plan, allocate resources in a systematic way toward system reliability, efficiency, and safety.
SM&O Focus on Operations

By 2030: 24,500 miles of roadway
35% growth from 2017
By 2050: 7.7 million population
 current 4.55 million

Agencies in the MAG region recognize that continuing to focus on building and expanding roads is not a sustainable solution, and will not meet the transportation system needs of the MAG region as it grows.
Integrated Corridor Management

**PRIORITY INVESTMENT AREA #1:**
- Key component of the SMO Vision
- Important operational objective
- Freeways & adjacent arterials

**BASE ICM CORRIDOR REQUIREMENTS**
- Infrastructure, process and plans
- Staffing resources
Priority Arterial Corridors

PRIORITY INVESTMENT AREA #2:

Level 1 Requirements
- Real-time visual monitoring
- Detection – operations & data collection
- Retiming of signals – Every 5 years

Level 2 Requirements
- Expand monitoring
- Provide arterial travel times & traveler info
- Emergency Vehicle Preemption
### Other Priority Investment Areas

**#3 LOCAL PRIORITY CORRIDORS**
- Local priorities for available funding
- TAG recommended for identified investments

**#4 REGIONAL OPERATIONS**
- Programmatic support of operations vs. infrastructure
- Continues current operations investments
- New strategies

- [Enhanced ICM Strategies](#)
- [Regional CAV Strategy](#)
- [3-year Pilot After-Hours Virtual TMC](#)
- [Real-time Transit Coord](#)
- [Acquisition of real-time data](#)
## Performance Measurement

- Metrics allow MAG to measure SMO program impacts → Proposition 400 extension
- Several reported on by SMO partners; Valley Metro & AZDPS

<table>
<thead>
<tr>
<th>Investment Category</th>
<th>Performance Measure</th>
<th>Relevant Performance Metrics</th>
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<tbody>
<tr>
<td>Integrated Corridor Management</td>
<td>Incident Management</td>
<td>Freeway clearance time</td>
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<tr>
<td></td>
<td></td>
<td>Annual number of secondary crashes</td>
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<tr>
<td></td>
<td>Travel Time Reliability</td>
<td>95% planning time index</td>
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<td></td>
<td></td>
<td>Truck Travel Time Reliability (TTTR) Index</td>
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<tr>
<td></td>
<td></td>
<td>Vehicle miles traveled (VMT)/year</td>
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<td></td>
<td>Corridor Throughput</td>
<td>Person throughput/year</td>
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<td>Transit route on-time performance</td>
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<td></td>
<td>Safety</td>
<td>Total fatal and injury crashes/year</td>
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<td>Annual crash rate</td>
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<tr>
<td>Regional Priority Arterials</td>
<td>Travel Time Reliability</td>
<td>95% planning time index</td>
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<td>Transit Mobility</td>
<td>Transit route on-time performance</td>
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<td>Regional Operations Priorities</td>
<td>Transit ridership</td>
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<td>After-hours TMC Operations</td>
<td>Frequency of response to after-hours traffic incidents</td>
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<td>Freeway Service Patrol</td>
<td>Number of assists per year</td>
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<td></td>
<td>Traveler Information and Alerts</td>
<td>Travel time coverage (miles)</td>
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<td>Regional mobile application subscribers</td>
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Implementation

Phase 1 Funding Plan: 2020 through 2024

- Projects programmed in the MAG Transportation Improvement Program (TIP)
- Projects to be included in the MAG work program for 2020

<table>
<thead>
<tr>
<th>Project Types</th>
<th>2020-2022 Cycle</th>
<th>Annual Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICM Strategies</td>
<td>$9.2M</td>
<td>$3.06M</td>
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<td>These projects will likely include detection, communication, CCTV on ICM corridors, data on ICM corridors</td>
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<td>Priority Arterials</td>
<td>$9.6M</td>
<td>$3.3M</td>
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<td>These projects will focus on identified priority corridors - fill in gaps, integration, communications, signal timing, visual monitoring at all major-major intersections, data collection</td>
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<td>Upgrade Arterial</td>
<td>$10.2M</td>
<td>$3.4M</td>
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<td>Equipment</td>
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<td>These projects address lifecycle equipment upgrade needs on existing infrastructure - signals, detection, cameras, communications, integration. Priority should be given to ICM and priority arterials</td>
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<tr>
<td>Local Priorities</td>
<td>$9M</td>
<td>$3.0M</td>
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<td>These funds are to support local priorities identified by agencies. Could include plans, non-priority corridors, TMC/ATMS enhancements, etc.</td>
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Project Overview/Key Tasks

- Project Management and Technical Oversight
- Best Practices in Urban Transportation Systems Management & Operations
- Current & Planned ITS Infrastructure
- Long Term Vision and Concept of Systems Management and Operations
- Regional Priorities for SM&O Investments
- Initial SM&O Implementation Plan
- Data Collection, Performance Measurement and Reporting Processes
Process to Establish Priority Regional Arterials

- **Challenge:**
  - Consensus on what constitutes a ‘priority corridor’

- **Process:**
  - Establishing criteria and weighting to evaluate corridors
  - Data-driven and repeatable in future years

- **Result:**
  - Traffic Flow (VMT/mile), Safety/Congestion, Travel Time Reliability
  - All had equal weighting in the evaluation
  - Additional considerations: High capacity transit routes, freight corridors
Lessons Learned from the Prioritization Task

- Data outputs don’t always tell the full story
  - Corridors can be operationally challenging, even if the ‘data’ says otherwise

- Segments need to be manageable to capture operational challenges
  - Too long – issues get diluted
  - Too short – analysis becomes arduous
  - Start and end points needed to cross freeways and major intersections – these usually provide some important land use considerations

- Segments should be aggregated to arrive at meaningful corridors
  - Gaps in segments don’t indicate a lack of operations priority
  - Projects will be ultimately be implemented on corridors, not segments
SMO Strategy Implementation

- **Phase 1**: 2020 – 2024 (timeframe reaching the sunset of Proposition 400)
- **Phase 2**: 2025 – 2030 (timeframe for post-Proposition 400 and potential Proposition 400 extension)
- Post 2030
Staffing and Workforce Needs for SMO

- **Gap:**
  - Limited recent guidance on recommended staffing levels for operations
  - Maintenance staff guidelines from ITE are a good start
  - Limited guidance on technical positions to support TSMO – networking, data analysis, ICM requirements

- **How We Addressed:**
  - Applying standard formulas resulted in significant staff shortages for ops and maintenance functions across the board
  - Recommended concept for after-hours ICM pilot to determine local staffing needs for post-business hour operations
  - Regional contract for fiber maintenance
Questions?