



# 2021 STAMP

Statewide Arterial  
Management Program  
(STAMP)

## ACTION PLAN





## EXECUTIVE SUMMARY

The Florida Department of Transportation's (FDOT) **Statewide Arterial Management Program (STAMP)** is part of the State Traffic Engineering and Operations Office (STEOO). The STAMP is a collaborative effort between the Transportation Systems Management and Operations (TSM&O) program staff, District TSM&O Program Engineers, and arterial management engineers. Members of the STAMP group work towards a shared vision to support the Districts and their local agencies in improving arterial safety and mobility through achievement of outcome-based goals.



The STAMP *Action Plan* provides outcome-based actions intended to guide the collective arterial management efforts and documents progress encouraging the exchange of experiences, collaboration, and coordination. The 2021 update to the STAMP *Action Plan* has identified the following six outcome-based objectives for initiation within five focus areas for the upcoming biennial cycle:

### Infrastructure Upgrades ↗

1. **Implement Central System Upgrades** ↗: All Districts should begin updates to TMC central software and servers to support Advanced Traffic Controller (ATC)-enabled data and arterial management strategies.

This symbol ↗ denotes the adjacent text is a hyperlink to the referenced data.

### Data Management ↗

2. **Develop Data Analytics Requirements** ↗: Based on data sources, performance assessment requirements, and dashboard goals and objectives, Central Office (CO) and Districts should initiate development of collective requirements for the data analytics engine. Requirements include data archival, access, security, and user interface.

### Performance Assessment ↗

3. **Develop Dashboards Goals and Objectives** ↗: CO and Districts should collaborate to develop common goals and objectives for historical and real-time performance measures to be captured in a standardized dashboard to address the following topics: information provided, refresh rates, where dashboards can be viewed, etc.

### Emerging Technologies ↗

4. **Implement Advanced Detection Technologies** ↗: Districts should continue to deploy advanced detection technologies, such as ATSPM applications, and share their lessons learned to support arterial operations and management decisions on priority corridors.

### Operations & Maintenance ↗

5. **Develop and deliver funding and program tutorial for STAMP** ↗: Central Office should develop and circulate (based on STAMP Group input) tutorials on programming requirements and funding options for STAMP communication, controllers, central systems, management strategy implementation, operations, and maintenance.
6. **Additional Staffing for TSM&O Strategies** ↗: Districts should begin developing a plan to identify needs and incorporate staffing levels in arterial management programs to facilitate additional TSM&O strategies.



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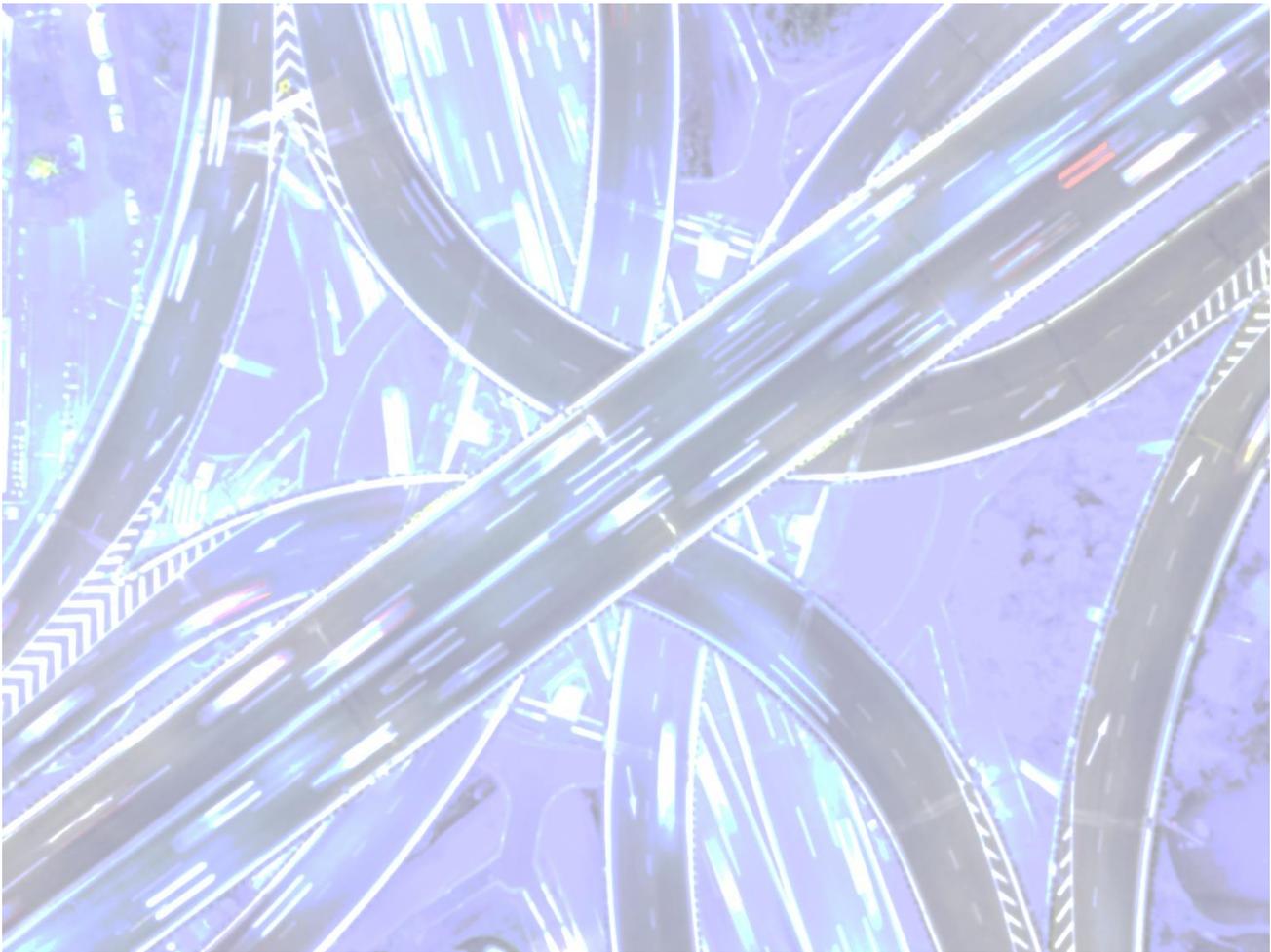
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## INTRODUCTION

The Florida Department of Transportation's (FDOT) Statewide Arterial Management Program (STAMP) is a function of the State Traffic Engineering and Operations Office (STEOO). The STAMP is a collaborative effort of the Transportation Systems Management and Operations (TSM&O) program staff, District TSM&O Program Engineers, and arterial management engineers. Members of the STAMP team work towards a shared vision to support the Districts and their local agencies in improving arterial safety and mobility through achievement of outcome-based goals.

A complete description of the background of the STAMP is provided in [Appendix A](#) ↗

The STAMP *Action Plan* provides outcome-based actions intended to guide the collective arterial management efforts and documents past progress encouraging the exchange of experiences, collaboration, and coordination. The outcome-based actions in the STAMP Action Plan were developed in support of the FDOT [2017 TSM&O Strategic Plan](#) ↗ and [2019 Connected and Automated Vehicles \(CAV\) Business Plan](#) ↗.

The STAMP Action Plan is updated on a biennial cycle to document progress, reassess goals, and identify future actions. The 2021 update to the [2018 STAMP Action Plan](#) ↗ is divided into the following sections; Introduction, Progress Update, Action Items, and Conclusions & Recommendations. The document updates the goals and actions necessary to accomplish strategic objectives within the five focus areas shown in Figure 1:



Figure 1: Focus Areas



## PROGRESS UPDATE

### Current Progress

The 2021 update to the STAMP Action Plan has summarized the collective efforts of the participants to date in the graphic below. A detailed summary is provided within [Appendix B](#). The previously completed activities have been grouped into the following three phases:

- **Initialization**
- **Program Development**, and
- **Implementation and Operation**

*The timeframe, phase, and a summary of the activities are summarized in Figure 2.*

A complete discussion of STAMP progress on the Action Plan is provided in [Appendix B](#).

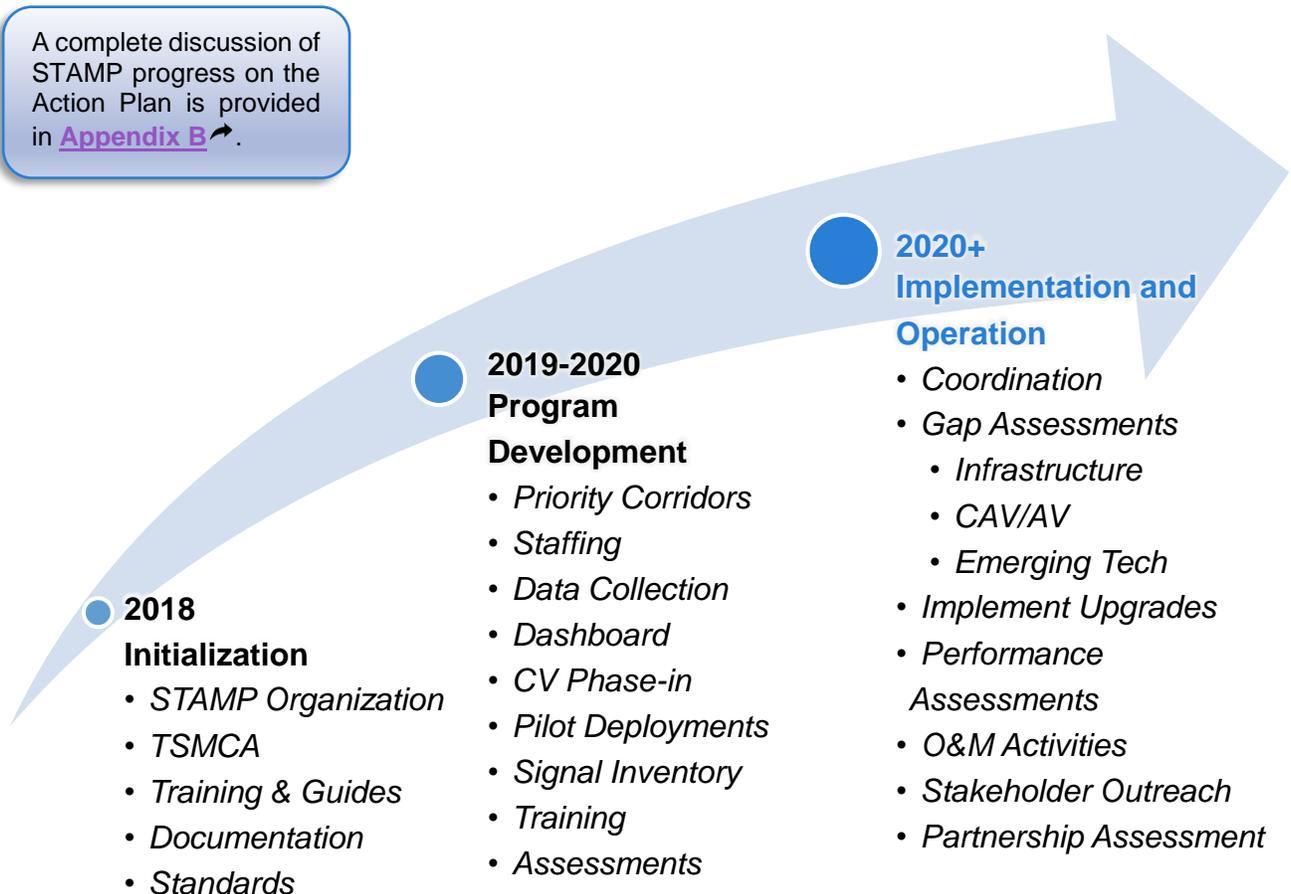


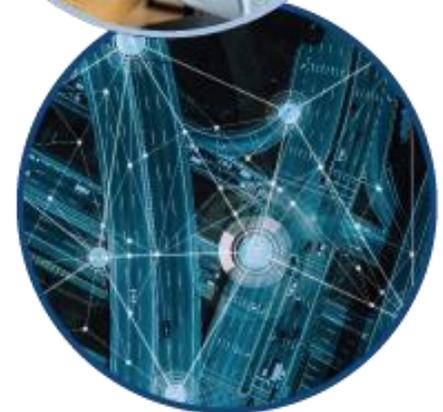
Figure 2: Implementation Roadmap

### Implementation and Operation Phase

The 2021 update to the STAMP *Action Plan* coincides with the launch of **the Implementation and Operation phase** of the STAMP *Action Plan*. The following activities were identified in the [2018 STAMP Action Plan](#) to begin during the Implementation and Operation Phase:

- Coordinate with Districts to identify their specific arterial management needs
- Assess infrastructure needs and identify opportunities and conduct gap assessments to:
  - ⇒ Upgrade District systems
  - ⇒ Deploy connected and automated vehicle applications
  - ⇒ Deploy, or prepare for, emerging technologies
- Complete infrastructure upgrades
- Implement smart arterial projects
- Conduct performance and outcome assessments
- Perform O&M activities
- Advance outreach with stakeholders
- Evaluate the impacts of agency and industry partnerships

At the time of this update, the STAMP team has received completed surveys from and conducted meetings with each of the Districts to coordinate on each Districts' arterial management needs and to evaluate the status of the ongoing efforts to accomplish each of the actions identified for the Implementation and Operation phase. [Appendix C](#) includes the survey data and a summary of the coordination that has occurred with each District.





## ACTION ITEMS

### Overview

The coordination with the STAMP stakeholders has identified those action items that have been achieved to-date and those action items that should be targeted for the upcoming STAMP biennial cycle. The status, phase, target start year, and timeline for implementation of the STAMP action items is provided in [Appendix D](#).



### Action Plan Accountability and Monitoring

The FDOT Central Office and the Districts should provide Quarterly Progress Reports on each action item to the STAMP lead, the Managed Lanes, Connected Vehicles and Arterial Management Engineer. The STAMP lead should monitor and report progress to the Director of the State Traffic Engineering and Operations Office (STEOO) and the stakeholders.

### Action Items for 2021 Biennial Cycle

The 2021 update to the [2018 STAMP Action Plan](#) has identified the following six objectives as critical for statewide **initiation** during the upcoming biennial cycle:

#### Infrastructure Upgrades

1. **Implement Central System Upgrades**: All Districts should begin updates to TMC central software and servers to support ATC-enabled data and arterial management strategies.

#### Data Management

2. **Develop Data Analytics Requirements**: Based on data sources, performance assessment requirements, and dashboard goals and objectives, Central Office (CO) and Districts should initiate development of collective requirements for the data analytics engine. Requirements include data archival, access, security, and user interface.

#### Performance Assessment

3. **Develop Dashboards Goals and Objectives**: CO and Districts should collaborate to develop common goals and objectives for historical and real-time performance measures captured in a standardized dashboard to address the following topics: information provided, refresh rates, where dashboards can be viewed, etc.

#### Emerging Technologies

4. **Implement Advanced Detection Technologies**: Districts should deploy advanced detection technologies such as ATSPM applications, and share their lessons learned to support arterial operations and management decisions on priority corridors.

#### Operations & Maintenance

5. **Develop and deliver a funding and program tutorial for STAMP**: Central Office should develop and circulate (based on STAMP Group input) tutorials on programming requirements and funding options for STAMP-based communications, controllers, central systems, management strategy implementation, operations, and maintenance.

- 6. Additional Staffing for TSM&O Strategies**↗: Districts should begin developing a plan to identify needs and incorporate staffing levels in arterial management programs to facilitate additional TSM&O strategies.



## CONCLUSIONS & RECOMMENDATIONS

The stakeholders of the STAMP work towards a shared vision to support the Districts and their local agencies in improving arterial safety and mobility through achievement of outcome-based goals.

The STAMP *Action Plan* provides outcome-based actions intended to guide the collective arterial management efforts and documents past progress encouraging the exchange of experiences, collaboration, and coordination. The 2021 update to the [2018 STAMP Action Plan](#) has identified the following six objectives as critical for statewide **initiation** during the upcoming biennial cycle:

### Infrastructure Upgrades

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5. **Develop and deliver funding and program tutorial for STAMP**: Central office should develop and circulate (based on STAMP Group input) tutorials on programming requirements and funding options for STAMP communication, controllers, central systems, management strategy implementation, operations, and maintenance.
6. **Additional Staffing for TSM&O Strategies**: Districts should begin developing a plan to identify needs and incorporate staffing levels in arterial management programs to facilitate additional TSM&O strategies.



## APPENDIX A – BACKGROUND

The Florida Department of Transportation's (FDOT) Statewide Arterial Management Program (STAMP) Action Plan provides goals, objectives, and required actions in the following five focus areas:

- **Infrastructure Upgrades**
- **Data Management**
- **Performance Assessment**
- **Emerging Technologies**
- **Operations & Maintenance**

The STAMP Action Plan is a statewide collaborative effort that summarizes the Arterial Management Program accomplishments in each of the FDOT Districts. A list of all programs, systems, and infrastructure are compiled in the STAMP Action Plan as a single source to identify the statewide collective efforts. The implementation plan provides a cyclically monitored roadmap of the progress, actions, and activities. The STAMP Action Plan also offers staff involved in arterial management a source to share common experiences, collaboration, and coordination statewide.

In the 2018 STAMP Action Plan, the STAMP Group condensed nearly 70 action items into five action-oriented focus areas based on progress and remaining needs. This 2021 STAMP Action Plan is a living document and will be updated based on District and FDOT partner needs, input, goals, accomplishments, and opportunities.

FDOT's Stamp Action Plan is part of the State Traffic Engineering and Operations Office (STEOO) and closely collaborates with the Transportation Systems Management and Operations (TSM&O) program, District TSM&O Program Engineers, and arterial management engineers. The 2021 STAMP Action Plan is an updated version of the 2018 STAMP Action Plan, developed to support the mission and vision of the 2017 TSM&O Strategic Plan which in turn supports the overall FDOT mission and vision.





## APPENDIX B – 2021 PROGRESS UPDATE

### 2018 Initialization Phase

The 2018 Initialization Phase, summarized below, describes the District coordination, agreements, training, documentation, and standards that have been undertaken for Arterial Management:

- **STAMP Collaboration, Coordination, and Oversight**
  - ⇒ Established the STAMP Group consisting of arterial engineers and managers and TSM&O Program Engineers to coordinate on action items and priorities
  - ⇒ Established the foundation for the STAMP Action Plan through collaboration and coordination
  - ⇒ Developed the STAMP Action Plan based on District feedback
  - ⇒ Finalized 69 action items and established performance measures
  - ⇒ Incorporated arterial management funding into the work program instructions
  - ⇒ Established the damage reimbursement process for District use
- **Traffic Signal Maintenance and Compensation Agreement (TSMCA)**
  - ⇒ Revised the [TSMCA](#) ↗ to include damage reimbursement, maintenance performance measures, and annual reporting
  - ⇒ Developed a traffic signal database with signal locations as identified in TSMCA “Exhibit A”
  - ⇒ Developed a traffic signal inventory geodatabase listing the maintaining agency of interconnected and monitored signals
- **Training and Guides**
  - ⇒ Developed Traffic Signal 101 (<http://wbt.dot.state.fl.us/ois/TSMO/TSMOA.htm> ↗) and 102 (<http://wbt.dot.state.fl.us/ois/TSMO/TSMOB.htm> ↗) computer-based training materials (Level 1)
  - ⇒ Developed Adaptive Signal Control Technologies (ASCT) training materials
- **STAMP Documents**
  - ⇒ Developed traffic signal retiming standard scope template
  - ⇒ Developed DRAFT traffic signal maintenance inspection checklist and performance measure tracking program
  - ⇒ Developed DRAFT traffic signal controller plans
- **Standards and Specifications**
  - ⇒ Modified [FDOT Design Manual \(FDM\)](#) ↗ chapters for updates in traffic signals and intelligent transportation systems (ITS) chapters
  - ⇒ Updated [FDOT Standard Specifications for Road and Bridge Construction](#) for traffic signal controllers (Spec 671) to make Management Information Bases (MIBs) available for traffic
  - ⇒ Signal Controller Broadcast Messages (TSCBM) that are compatible with Society of Automotive Engineer (SAE) J2735 201603 and data elements listed for Traffic Controller High Resolution Data Logging Requirements

## 2019-2020 Program Development

The 2019-2020 Program Development summarizes the completed activities that were identified in and planned in the 2019-2020 Program Development Phase:

- **Districts' identified and redefined Top Ten priority action items:**



1. Develop priority corridors for active arterial and integrated corridor management
2. Identify staffing resources
3. Develop plan for data collection
4. Develop traffic signal controller upgrade plan
5. Develop dashboard requirement matrix
6. Standardize retiming scope and estimating process
7. Implement CV phase-in plan for traffic control
8. Implement pilot projects for testing and evaluation of emerging technology
9. Identify local agency to pilot Traffic Signal Management Plan
10. Identify Local Agency to pilot on Traffic Signal Data Management Plan

- **Captured latest signal inventory information related to signal counts, controller upgrades, opt-outs etc. and published it to the [eTraffic](#) application**
- **Developed draft Traffic Signal Data Management Plan**
- **Developed draft Traffic Signal Management Plan**
- **Presented the traffic signal training courses**
- **Supported ATSPM implementation projects**
- **Districts identified priority AMP corridors, performance data sources, and began baseline and quarterly performance assessments**
- **Completed assessment of benefits of adaptive traffic signal control**
- **Supported SPaT pilot project development and implementation in Tallahassee, Gainesville, and Pinellas County**
- **Developed statewide third-party agreements for collection of agency-wide SPaT data and tracked implementation statewide**



## APPENDIX C - IMPLEMENTATION & OPERATION PHASE COORDINATION

### Overview

The STAMP Program has collected surveys from and conducted meetings with each of the districts to coordinate on each districts' arterial management needs. The surveys and meetings were used to evaluate the status of the ongoing efforts to accomplish each of the actions identified for the Implementation and Operation phase. Each of the activities and their current progress is summarized below:

### Coordinate with Districts to identify their specific arterial management needs

This activity is led by **Central Office** and initial coordination is **ongoing**. Additional coordination will be required throughout this phase of the STAMP Action Plan. The initial coordination included the distribution of a survey and a follow-up meeting with all District TSM&O Program Engineers. During the meeting, their specific arterial management needs were assessed.

Common threads among the districts included greater focus on administrative needs than technological needs. All districts report progress and challenges associated with the implementation phase of the STAMP Action Plan. Various districts report significant progress toward achievement of many of the action items listed in the 2018 STAMP. All districts indicated concerns with funding, staffing, or a lack of control over the systems they are listed as responsible for addressing because of the nature of the relationships with the local maintaining agencies.

One benefit noted across the STAMP group is that District TSM&O Program Engineers have largely been thinking strategically and making investments into areas of strength and not always within the same action items. As such the collective STAMP workgroup is benefiting from the efforts gained as specific district efforts advance one or more action items within the STAMP Action Plan and learn from their experiences. Districts reporting significant progress can save other districts from investing resources into processes or technologies that have proven inadequate if their experiences are documented and shared.

### Assess infrastructure needs and identify opportunities and conduct gap assessments to:

- **Upgrade District systems**
- **Deploy connected and automated vehicle applications**

This activity is led by **Central Office** and assessments are **ongoing**. Central Office is currently conducting assessments of the Districts' capabilities and will summarize the results for the STAMP workgroup as a Capability and Maturity Matrix.

### Complete infrastructure upgrades

This activity is led by the **Districts** and upgrades are **ongoing**. All districts report programming infrastructure projects since the previous update cycle and all continue to work on projects targeting the remaining action items. Some districts are programming improvements into the work program and others are upgrading ad-hoc as opportunities arise (i.e., in conjunction with resurfacing projects).

### Implement smart arterial projects

This activity is led by the **Districts** and projects are **planned** or **ongoing**. Most districts report ongoing efforts to implement smart arterial projects. Some districts report incorporating smart intersection language in their project scoping process. Some districts report smart intersection projects are ongoing and/or nearing completion.

### Conduct performance and outcome assessments

This activity is led by **Central Office** and assessments are **planned**.

### Perform O&M activities

This activity is led by the **Districts** and O&M activities are **ongoing**. All districts report ongoing infrastructure O&M efforts with mixed success. Dependence on a variety of local maintaining agencies throughout the state result in a variety of approaches to local agency O&M responsibilities that are highly dependent on the local maintaining agency's staffing and funding resources. All but one of the District TSM&O Engineers report challenges associated with dependence on local maintaining agencies for O&M, with particular concern expressed for dependence on local maintaining agencies for O&M of advanced systems such as smart intersections.

### Advance outreach with stakeholders

This activity is led by **Central Office** and outreach activities are **ongoing**. Central office is currently developing additional training and outreach opportunities to promote STAMP Action Items statewide. Additional coordination will be required with the districts to continue to identify and develop outreach opportunities statewide.

### Evaluate the impacts of agency and industry partnerships

This activity is led by **Central Office** and evaluations are **planned**.



 **APPENDIX D – ACTION ITEMS**

Key

Focus Area – One of five focus areas identified for this biennial cycle.

Objective – Current strategic objective supporting the focus area.

Action Name – The action supporting the focus area. Also denotes phasing when a multi-phased action was identified to support an objective.

Action Description – Descriptive summary of the current action supporting an objective.

Implementation Time Frame – An anticipated time frame for implementation shown in years. The implementation time frame may not have a well-defined completion date when a “+” symbol or a range is shown.

FY Start – Target start year for responsible agencies to initiate the action item. When all districts report ongoing progress, the FY Start is denoted as N/A.

Responsibility – The agencies responsible for implementation of an action item.

Status – Current statewide status across all responsible agencies.

*Table 1: Objectives and Action Items for Infrastructure Upgrades*

Focus Area	Objective	Action Name	Action Description	Implementation Time Frame (Years)	FY Start	Responsibility	Status
Infrastructure Upgrades	Upgrade Communications Infrastructure	<b>Phase 1</b> Priority Communication Upgrades	Implement communication upgrade projects on priority corridors and routes of significance.	2+	N/A	Districts & LMAs	Ongoing
		<b>Phase 2</b> SHS Communication Upgrades	Implement communication upgrade projects on the remainder of the SHS with signals.	2+	2026	Districts	Planned
	Upgrade Controllers	<b>Phase 1</b> Priority controller upgrades	Implement ATC upgrade projects on priority corridors and routes of significance	2+	N/A	Districts & LMAs	Ongoing
		<b>Phase 2</b> SHS controller upgrades	Implement ATC upgrade projects on the remainder of the SHS with signals	2+	2026	Districts & LMAs	Planned
	Upgrade Central Systems	Implement central system upgrades	Update TMC Central Software and servers to support ATC-enabled data and arterial management strategies.	1	2023	Districts	Ongoing

Table 2: Objectives and Action Items for Data Management

Focus Area	Objective	Action Name	Action Description	Implementation Time Frame (Years)	FY Start	Responsibility	Status
Data Management	Develop Data Analytics Platform	<b>Phase 1</b> Assess performance data sources	Identify geo-referenced data sources for traffic signals, detector and traffic controller data, communication, crashes, traffic volumes, traffic speeds, travel time, and others. Determine ability of the sources to support an application program interface (API) to upload data to an analytics engine.	1	2022	Central Office & Districts	Ongoing
		<b>Phase 2</b> Develop data analytics, security, and archiving requirements & specifications.	Based on data sources, performance assessment requirements, and dashboard goals and objectives, develop requirements for the data analytics engine. Requirements include data archival, access, security, and user interface. Collaborate in development of standards for the identified requirements.	1	2023	Central Office & Districts	Ongoing
		<b>Phase 3</b> Implement data analytics engine	Procure commercial off the shelf software or systems (COTS) or develop data analytics engine. Implement and use the engine to develop performance assessments and dashboards.	1-4	2024	Central Office & Districts	Planned

Table 3: Objectives and Action Items for Performance Measures and Dashboards

Focus Area	Objective	Action Name	Action Description	Implementation Time Frame (Years)	FY Start	Responsibility	Status
Performance Measurement	Develop Performance Measurement Dashboards	<b>Phase 1</b> Develop dashboard goals and objectives	CO and Districts should collaborate to develop goals and objectives for historical and real-time dashboards to address the following topics: information provided, refresh rates, where dashboards can be viewed, etc.	1	2022	Central Office & Districts	Ongoing
		<b>Phase 2</b> Develop prototype dashboards	CO and Districts should collaborate to develop prototype dashboards based on goals, objectives, available data, and dashboard development resources.	1	2023	Central Office & Districts	Ongoing
		<b>Phase 3</b> Use dashboards	Districts should include both current and at least one year of historical trend dashboard output with their quarterly performance measure reports.	1	2024	Central Office & Districts	Planned

Table 4: Objectives and Action Items for Emerging Technologies

Focus Area	Objective	Action Name	Action Description	Implementation Time Frame (Years)	FY Start	Responsibility	Status
Emerging Technologies	Implement Arterial Management Strategies Facilitate Complete Streets	Implement Multimodal Technologies and Strategies	Districts, local agencies, and transit authorities should implement transit and freight signal priority, emergency vehicle preemption, pedestrian, and bicycle systems.	2+	N/A	Districts	Ongoing
	Implement CAV Applications	<b>Phase 1</b> Plan and program CAV application projects	Plan, prioritize, schedule, and program CAV roadside units (RSU) and application projects on priority corridors and routes of significance.	1-3	2025	Districts	Ongoing
		<b>Phase 2</b> Implementation CAV application projects	Implement CAV RSU projects on priority corridors and routes of significance.	2+	2026	Districts	Ongoing
	Implement Advanced Detection Systems	Implement advanced detection technologies	Districts should implement advanced detection technologies such as ATSPM applications, for all modes that include pedestrians and bicyclists on priority corridors and incorporate advanced detection systems into arterial management strategies and share their lessons learned.	2+	2026	Districts	Ongoing
	Develop and Implement Object Identification System	<b>Phase 1</b> Develop object identification system requirements	CO should develop requirements for and demonstrate an object identification system that uses real-time data to anticipate crashes and congestion for all modes of travel. The system should also recommend and implement mitigation strategies.	1	2021	CO	Ongoing
		<b>Phase 2</b> Implement object identification system	CO should work with a District and/or local agency to procure and implement an object identification system on an arterial roadway or roadway network.	1	2023	CO	Planned

Table 5: Objectives and Action Items for Operations and Maintenance

Focus Area	Objective	Action Name	Action Description	Implementation Time Frame (Years)	FY Start	Responsibility	Status
Operations & Maintenance	Funding and Work Program Training	Develop and deliver funding and program tutorial for STAMP	CO should develop and circulate (based on STAMP Group input) tutorials on programming requirements and funding options for STAMP-based communications, controllers, central systems, management strategy implementation, operations, and maintenance.	1	2023	CO	Ongoing
	Communication Training	<b>Phase 1</b> Develop communication infrastructure training Module	CO should review and widely circulate (based on STAMP Group input) existing <a href="#">training module on fiber optics infrastructure design</a> .	1	2025	CO	Planned
		<b>Phase 2</b> Develop communication network training Module	CO should review and widely circulate (based on STAMP Group input) a training module on communication network including wireless network design.	1	2025	CO	Planned
	ATC and Signal Training	Finalize and deliver advanced traffic signal course	CO should review, complete, and widely circulate (based on STAMP Group input) existing advanced training module on traffic controllers and traffic signal systems.	1	2025	CO	Ongoing
	Mobility Vital Few 1.6 Implementation	Assume O&M of key arterial corridors	District Traffic Operations, Maintenance, and local agencies to assume operations and maintenance of strategic arterials.	2+	2024	Districts	Planned
	Traffic Signal Retiming and Coordination	Manage traffic signal timing and coordination programs	Districts and local agencies should continue periodic signal retiming and coordination programs to ensure state highways operate at optimal safety and efficiency.	1	N/A	Districts	Ongoing
	Systems and Infrastructure Maintenance	Operate and maintain systems and infrastructure	Districts and local maintaining agencies should maintain field equipment and communication infrastructure on priority corridors and routes of significance at 95% or higher uptime.	1	N/A	Districts	Ongoing
	Additional Staffing for TSM&O Strategies	Identify needs to facilitate additional TSM&O strategies	Districts should begin developing a plan to identify needs and incorporate staffing levels in arterial management programs to facilitate additional TSM&O strategies.	1	N/A	Districts	Ongoing

