Traffic Management Center (TMC) Pooled-Fund Study (PFS)

American Association of State Highway and Transportation Officials Committee on Transportation System Operations 2024 Annual Meeting

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What Is the TMC PFS?

- The study consists of a group of public agencies and organizations.
- Members "pool" funds to address key traffic management system (TMS) and TMC challenges and issues.
- The agencies and organizations collaborate and pursue projects annually to develop technical resources and advance activities that address these challenges and issues.

**Goals:** To facilitate improving TMCs':

- Performance.
- Capabilities.
- Management and operation.

Visit the TMC PFS website to learn more! https://tmcpfs.ops.fhwa.dot.gov/[1]

What is the TMC PFS Value Proposition?

- Provides a forum for TMS managers and operators to share information.

- Facilitates the sharing of information and practices among members and the traffic management community.

- Raises awareness and expands the use of available technical resources.

- Develops technical resources addressing key challenges and issues agencies are facing with managing and operating their TMSs.

- Encourages collaboration and provides insights into opportunities and issues to consider with planning, designing, procuring, developing, and deploying the next generation of agencies' TMSs.

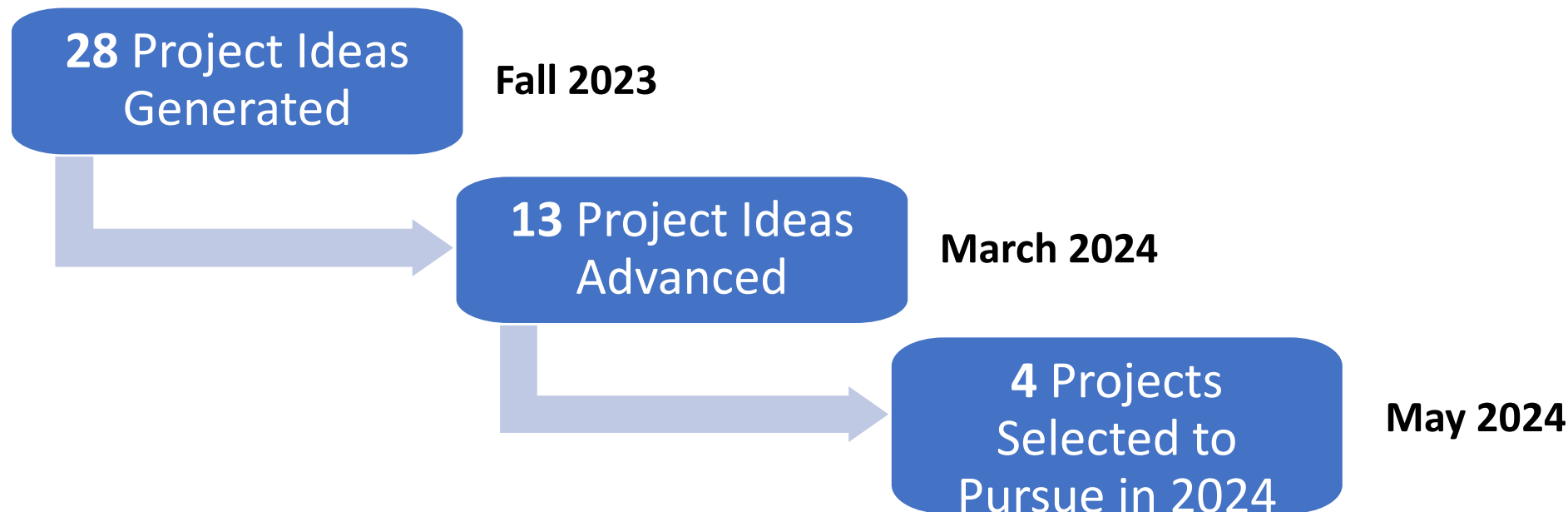24 Members, With 2 New Members Joining in 2024
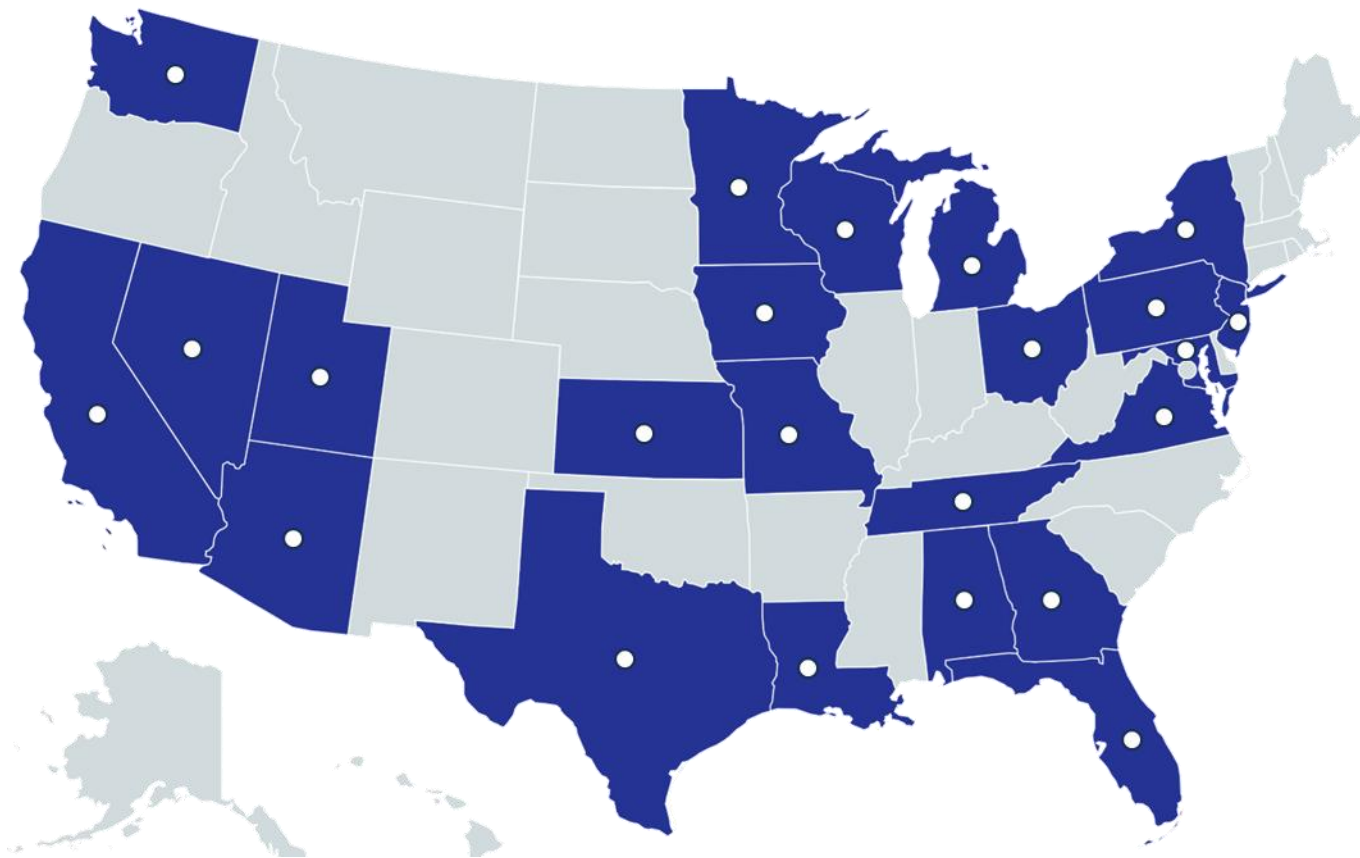
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What Challenges Are the TMC PFS Pursuing?

TMC PFS members have identified the need to pursue work that addresses:

- Assessing and reporting on TMS capabilities and performance.
- Planning, designing, procuring, and developing TMSs.
- Managing and operating TMSs.
- Planning, hiring, and building capacity and resources to adequately staff TMSs.

2024 TMC PFS Project Selection Process

28 Project Ideas Generated → **Fall 2023**

13 Project Ideas Advanced → **March 2024**

4 Projects Selected to Pursue in 2024 → **May 2024**

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Source: FHWA.

2024 TMC PFS Project Ideas Selected

(1) To be initiated in 2024/2025 with available funding

(2) To be initiated if funding can be obtained from other sources (NCHRP, FHWA)

A. Assessing and reporting on TMS capabilities and performance:
- A1. Sharing information and practices on TMS emerging topics (follow-on work). [1]
- A2. Developing standard performance indicators for TMC performance measurement.
- A3. Partnering with universities on assessing and reporting on TMS performance.

B. Planning, designing, procuring, and developing TMSs:
- B1. Real-time information exchange between TMSs and satellite or temporal operation centers.
- B2. Assessing potential for co-location of TMCs with public safety agencies.

C. Managing and operating TMSs:
- C1. Planning, assessing, and preparing for adapting daily TMS management and operations for varying schedules.
- C2. TMSs sharing video. [2]
- C3. Plans, methods, and resources to maintain and sustain TMS assets. [1]

D. TMS staffing, resources, and capacity building:
- D1. Analysis and planning to examine and potentially alter TMC operational hours.
- D2. Develop and sustain workforce training programs, initiatives, or activities to support TMC operations.
- D3. Technical curriculum development for TMC operators, phase 1—concept and requirements.
- D4. Update to TMC operator position description tool, instructions, and outreach material.
- D5. TMS program organization, management, performance, and staffing. [1]

TMC PFS Current Projects

2025 projects in *italic*.

Assessing and Reporting on TMS Capabilities and Performance:

1. Inventorying, Documenting, and Configuring TMS Assets and Resources —(jointly TMC PFS and Federal Highway Administration (FHWA) funded).
2. Classifying, Measuring, Collecting, and Using Information on Conditions of TMS Assets—**new in 2024**.
3. *Plans, Methods, and Resources to Maintain and Sustain TMS Assets.*

Planning, Designing, Procuring, and Developing TMSs:

4. TMSs Sharing and Using Different Types of Data.
5. Planning to Frame TMS Strategic Directions and Future Investments.
6. Locating and Placing TMS Field Devices—**new in 2024**.

Managing and Operating TMSs:

7. *Sharing Information on TMS Emerging Topics—**funding added in 2024 and 2025***.
8. Using Information from Social Media to Improve the Operation of TMSs.
9. Sharing and Using-Open-Source or Agency-Owned Software and Application Programming Interfaces.
12. *TMSs Sharing Video* *

TMS Staffing, Support Resources, and Capacity Building:

10. Methods to Identify Staffing Needs for TMSs and Developing or Updating Staffing Plans.
11. *TMS Program Organization, Management, Performance, and Staffing.*

* To be pursued via 2026's National Cooperative Highway Research Program (NCHRP).

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Other TMC PFS-Supported Projects

1. NCHRP Project 03-148: Preparing for Virtual Operation of TMSs.[2]

2. NCHRP Project 03-151: Data Subsystems and Data Management Plans for Traffic Management Systems.[3]

3. NCHRP Project 03-152: Integrating the Use of New Software Subsystems and Software Within Evolving Traffic Management Systems.[4]

4. Assessing TMS and providing feedback on FHWA project:[5]
   - Assessing TMS capabilities and performance.
   - Preparing, conducting, and summarizing TMS assessment results.
   - Assessing future needs and capabilities of the next generation of agencies' TMSs.
   - 2025–26 Pilot workshops to support agencies assessing TMS capabilities.

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Recently Completed TMC PFS Work Products

Now available:

1. Performance Measures and Health Index of Intelligent Transportation Systems Assets.[6]

2. Managing TMS Assets.[7]

3. Assessing and Reporting on TMS Capabilities and Performance—Current Practices.[8]

4. Predictive Analytics for TMS.[9]

5. Aligning TMC Staffing Capabilities for the Future of Systems Operations.[10]

6. Inventorying, Documenting, and Configuring TMS Assets and Resources—Current Practices.[11]

All reports are posted on the TMC PFS website's Completed Projects page
https://tmcpfs.ops.fhwa.dot.gov/completedproj.htm[12]

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TMS Emerging Topics Bimonthly Webinar Series

- The National Operations Center of Excellence (NOCoE) and FHWA are cosponsoring webinars for 16 selected emerging TMS topics.

- Registration, recorded webinars, fact sheets, and presentations are available for each topic at: https://transportationops.org/traffic-management-systems-and-centers/emerging-topics.[13]

Date	Webinar Topic
August 21, 2024, 11 a.m. eastern time	Using Variable Speed Limits During Adverse Weather Events
October 16, 2024	**TMCs Actively Managing and Operating Part-Time Shoulder Use**
December 11, 2024	Methods and Tools to Estimate Staffing Needs
February 19, 2025	TMCs Actively Managing the Use of Queue Warning Messages on Freeways
April 16, 2025	TMC Operator Performance
June 2025	Monitoring and Reporting on Performance of TMSs
August 2025	Opportunities for Artificial Intelligence and Machine Learning for Performing TMS Functions
October 2025	Partnering With Universities for TMC Support
December 2025	TMS Cybersecurity

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Virtual Technical Exchanges

- **Forums for members only** to discuss technical topics.
- Championing agency to frame the topic and share its own experiences, followed by round-robin discussion among other members.
- Held four times per year: first Wednesday of the month in February, April, August, and November at 1–2:30 p.m. Eastern Time.

Date	Topic
August 7, 2024	Specifications and Approved Products for TMS Assets Champion: James Landini (Florida DOT)
November 6, 2024	Implications of Resale of Video Feeds and Other Data Champion: John McClellan (Minnesota DOT)
February 5, 2025	Opportunities to Use Connected and Automated Vehicle-Data From Original Equipment Manufacturers for TMC Operations Champion: Ryan McNary (Pennsylvania DOT)

DOT = Department of Transportation.

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TMS Portal

The TMC PFS, FHWA, and NOCoE collaborate to provide a portal that enables agencies to post, share, and access technical resources in support of advancing current practices with managing, operating, and preparing for the next generation of TMSs.
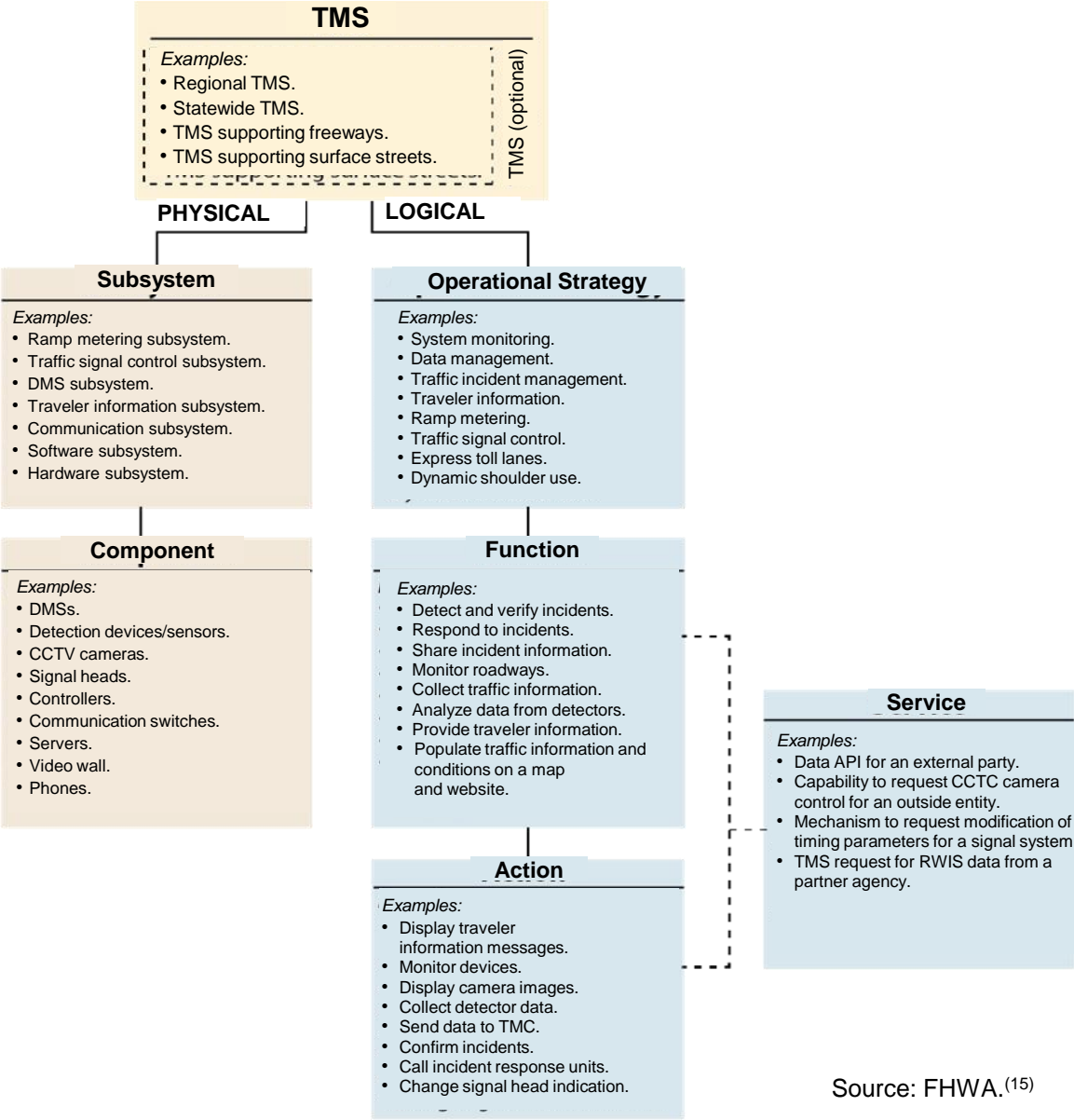

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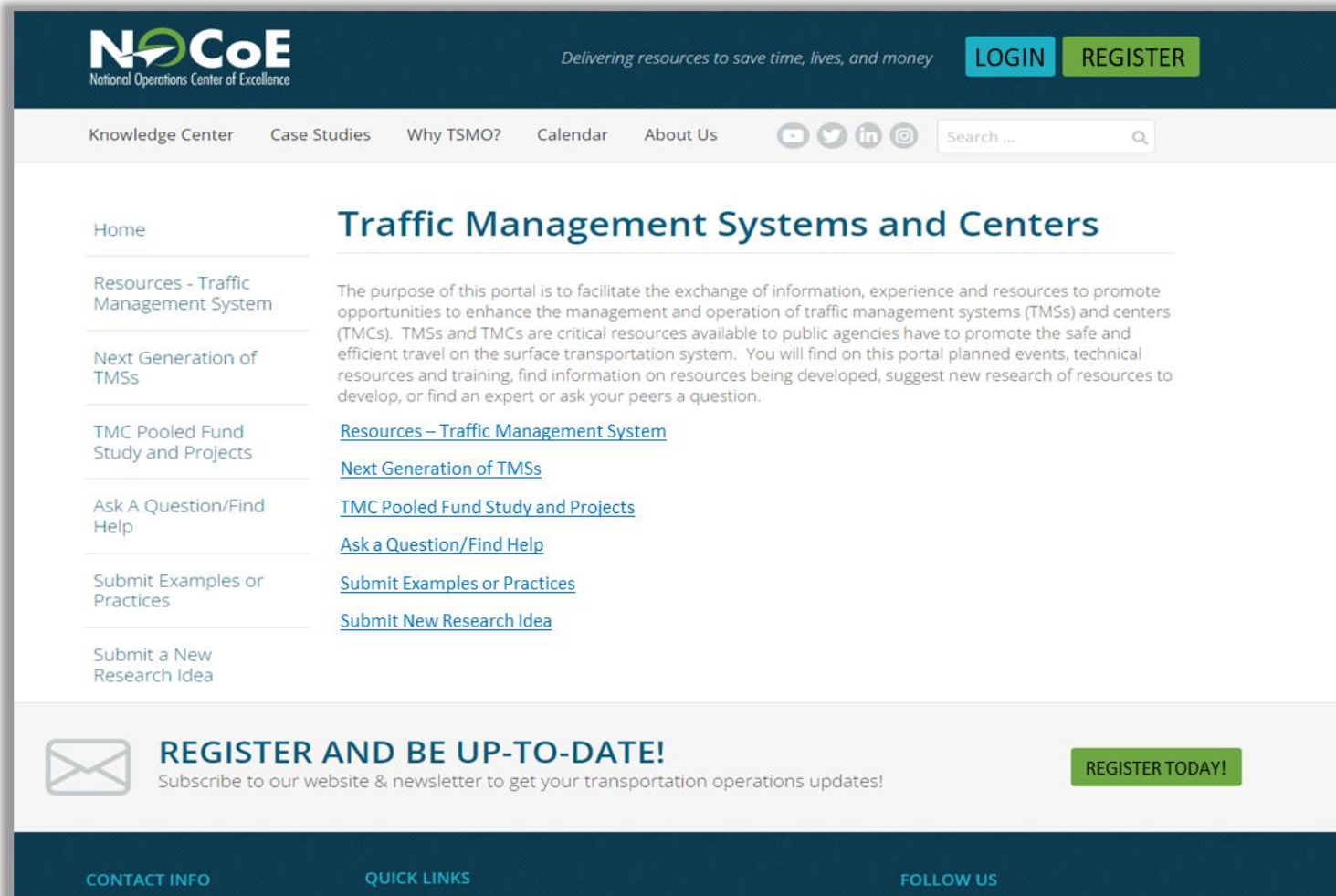
https://transportationops.org/traffic-management-systems-and-centers[14]
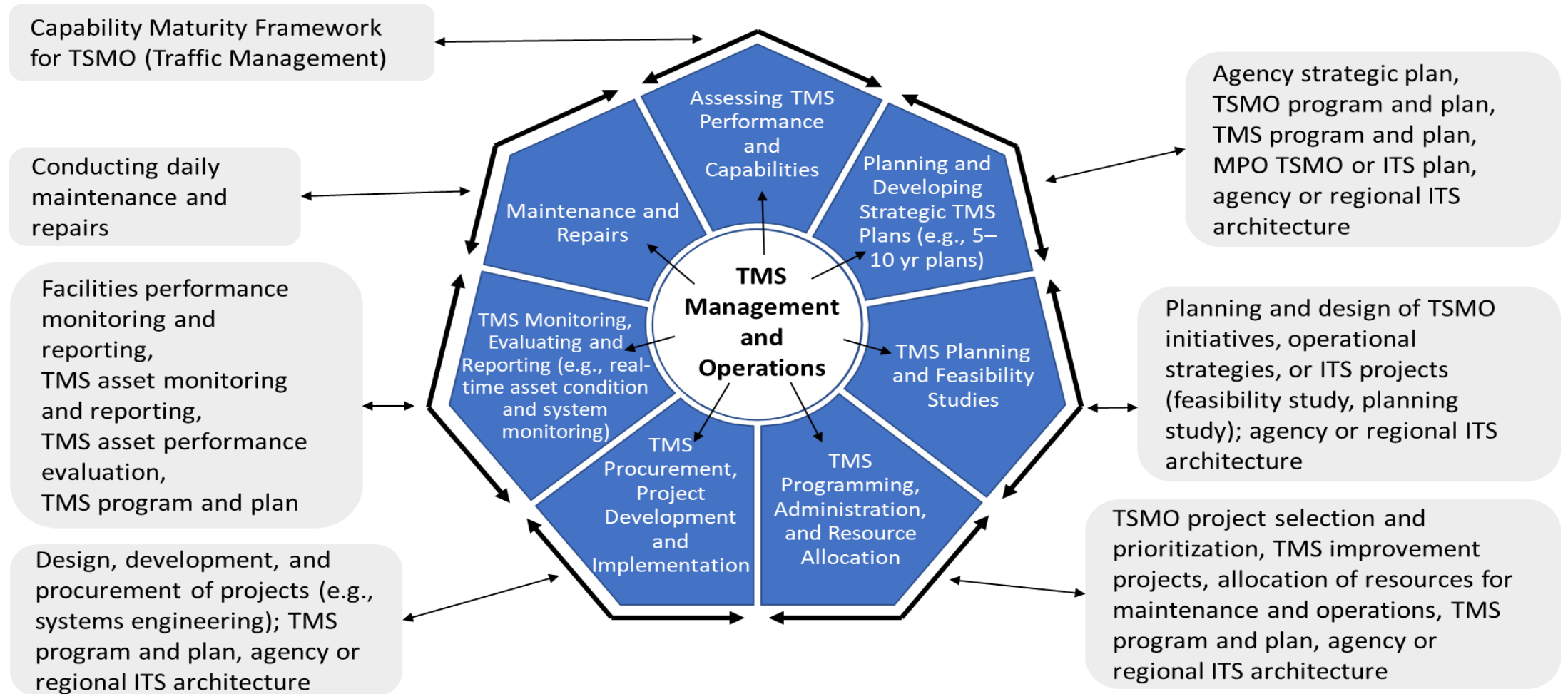
What Are TMSs?

- Complex operational systems that combine field equipment, advanced communications and information technology, and software.

- Software that collects and synthesizes traffic data, integrates external systems, and enables command and control of intelligent transportation system (ITS) field devices.

- TMS assets that are typically technology-based and must be managed differently than infrastructure assets.

TMS

Examples:
- Regional TMS.
- Statewide TMS.
- TMS supporting freeways.
- TMS supporting surface streets.

TMS (optional)

PHYSICAL   LOGICAL

Subsystem

Examples:
- Ramp metering subsystem.
- Traffic signal control subsystem.
- DMS subsystem.
- Traveler information subsystem.
- Communication subsystem.
- Software subsystem.
- Hardware subsystem.

Operational Strategy

Examples:
- System monitoring.
- Data management.
- Traffic incident management.
- Traveler information.
- Ramp metering.
- Traffic signal control.
- Express toll lanes.
- Dynamic shoulder use.

Component

Examples:
- DMSs.
- Detection devices/sensors.
- CCTV cameras.
- Signal heads.
- Controllers.
- Communication switches.
- Servers.
- Video wall.
- Phones.

Function

Examples:
- Detect and verify incidents.
- Respond to incidents.
- Share incident information.
- Monitor roadways.
- Collect traffic information.
- Analyze data from detectors.
- Provide traveler information.
- Populate traffic information and conditions on a map and website.

Service

Examples:
- Data API for an external party.
- Capability to request CCTC camera control for an outside entity.
- Mechanism to request modification of timing parameters for a signal system.
- TMS request for RWIS data from a partner agency.

Action

Examples:
- Display traveler information messages.
- Monitor devices.
- Display camera images.
- Collect detector data.
- Send data to TMC.
- Confirm incidents.
- Call incident response units.
- Change signal head indication.

Source: FHWA.[15]

API = application programming interface; DMS = dynamic messages sign; RWIS = Roadway Weather Information System.
Note: The solid lines show the internal system hierarchy and the dashed lines show the need for connection to external systems.

Processes and Activities Supporting TMS Management and Operations

Value Proposition for Improving TMSs Capabilities and Performance

Planning or Preparing for the Next Generation of Agencies TMSs

- Implementing active transportation and demand management strategies.

- Including emerging data sources.

- Integrating connected and automated vehicles.

- Sharing and using third-party and service-provider data.

- Implementing methods and using technologies that expand surveillance and coverage.

- Automating operations and management of operational strategies, control plans, services, or actions.

The active management cycle.

Source: FHWA. .[15]

For More Information on TMC PFS

TMC PFS website: https://tmcpfs.ops.fhwa.dot.gov[1]

National Operations Center of Excellence (NOCoE) TMS portal:
https://transportationops.org/traffic-management-systems-and-centers[14]

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