Workshop #1004: Ballroom C

Preparing, Conducting, and Summarizing the Results – Assessing Traffic Management Systems

Sponsoring Committees and Organizations:

- ITS Committee (ACP15)
- TRB Freeway Operations Committee (ACP20)
- TRB Traffic Signal Systems Committee (ACP25)
- TRB Joint Subcommittee on Active Traffic Management (ACP 20-5)
- TRB Artificial Intelligence and Advanced Computing Applications Committee (AED50)
- TRB Regional Transportation Systems Operation (RTSMO) Committee ACP 10
- Traffic Management Center Pooled Fund Study
- American Association of Highway and Transportation Officials (AASHTO) Committee on Transportation System Operations ITS Work Group
- International Bridge, Tunnel and Turnpike Association (IBTTA)
- European Association of Operators of Toll Road Infrastructures (ASECAP)
- ERTICO Innovation Platform Traffic Management 2.0 Work Group

Assessing TMSs Capabilities and Performance

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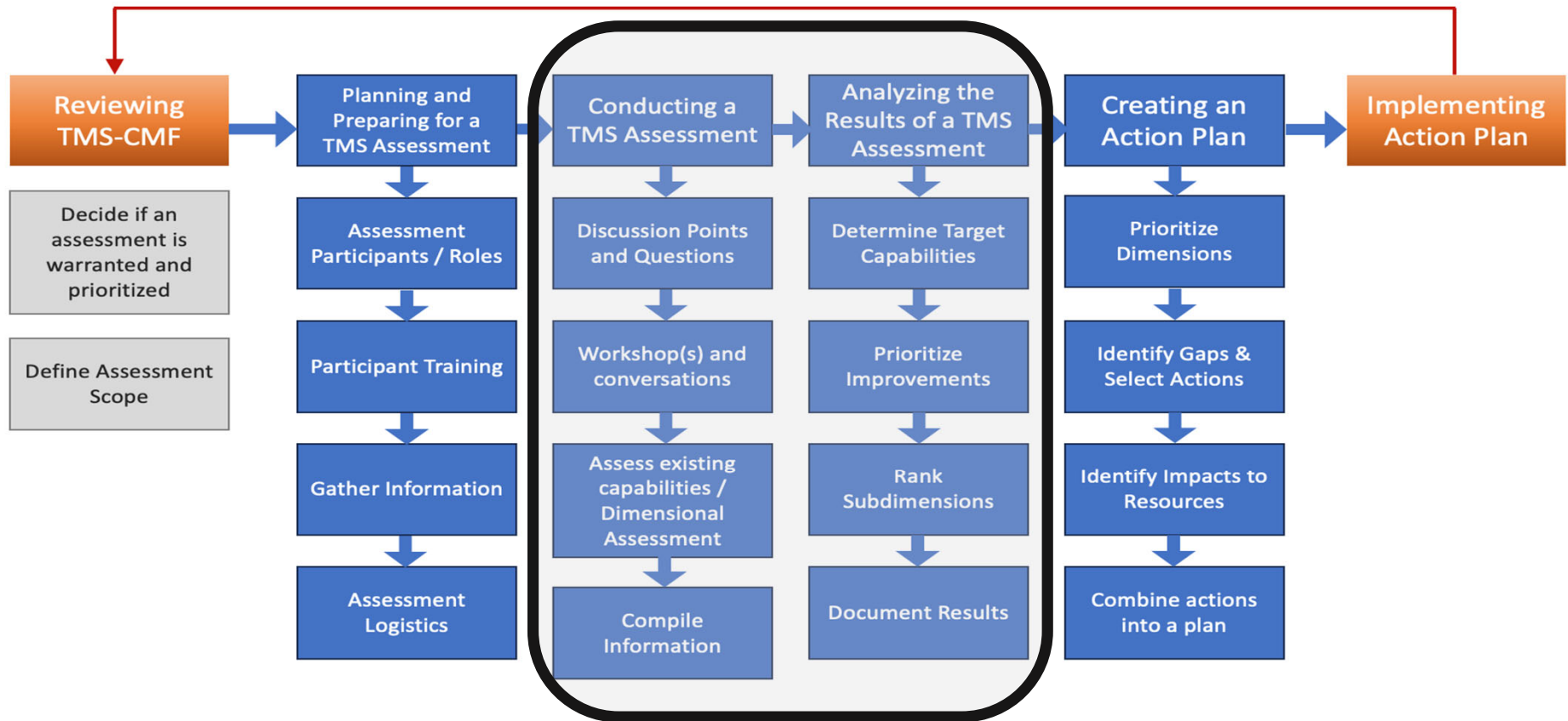
Session 1 Presentations:
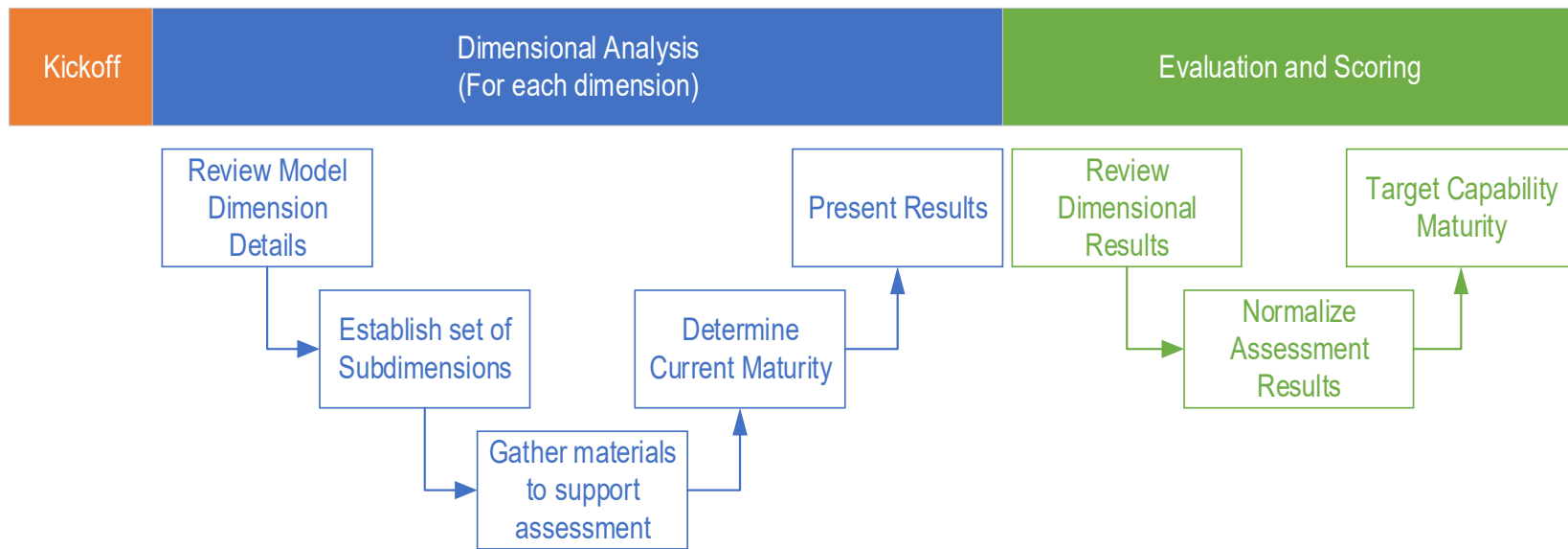
Assessing TMSs Capabilities and Performance

What might you consider with assessing TMS capabilities and performance?

Source: FHWA

Preparing for and Conducting a TMS Assessment

What issues to consider with assessing TMSs dimensions and sub-dimensions?

Source: FHWA

Assessing TMSs Capabilities and Performance

Dimension 1: *Business Process* – Possible TMS Sub-dimensions to consider

- TMS Program

- TMS Program Plan

- TMS proposed improvements incorporated into agency TSMO Program and Plan

- TMS resource needs incorporated into agency TSMO Program and agency process to prioritize and allocate resources

- Planning process established to identify needs and scope TMS improvements prior to obtaining approval for funding or procuring projects

- Policies governing the management and operation of TMS

- Procedures supporting the management and operation of TMS

Assessing TMSs Capabilities and Performance

EXAMPLE: Business Process improvements

Potential improvements could involve:
- Integrating TMS as a TSMO element in State/ Agency Long Range Plans and Regional Transportation Plans
- Establishing a multi-year TMS development plan
- Improving processes for identifying, budgeting, and programming funding
- Improving processes for planning and programming resources for TMS day-to-day operations, maintenance, and repairs
- Developing/improving an asset management process
- Improving clarity of organizational structure and administrative processes

Dimensions or Process Areas	What Is It?
1. Business Process	*Plans, Programs, Budget*
2. Systems & Technologies	*Approach to Designing, Developing, and Implementing Systems*
3. Performance Measurement	*Use of Performance Measures*
4. Workforce	*Improving Capability of Workforce*
5. Culture	*Changing Culture and Building Champions*
6. Collaboration	*Improving Working Relationships and Operations*
7. Day-to-day Management & Operations	*Preparing for, Managing, and Operating Daily*
8. Day-to-day Maintenance & Repair	*Planning for, Managing, and Conducting Daily Maintenance and Repairs*
9. Sharing and Using Data	Activities to enable sharing and use of data with sources external to TMS

Source: FHWA

Assessing TMSs Capabilities and Performance

Dimension 2: *Systems and Technologies* – Possible TMS Sub-dimensions

- Software subsystem

- Data subsystem

- TMS design

- Managing TMS assets

- TMS inventory

- Data management plans, capabilities, resources, and activities

- Configuration management

- Transition plans and activities

Assessing TMSs Capabilities and Performance

EXAMPLE: Systems & Technology improvements

- Focus on approaches to planning and building systems
  - Ensure agency and stakeholder needs are addressed
  - Follow systems engineering principles—to develop and trace requirements, establish a concept of operations, etc.

- Other issues to consider:
  - Technical feasibility
  - Operational feasibility
  - Condition of assets
  - Economic feasibility
  - Current and anticipated funding
  - Current and anticipated staff and contract support
  - Planning, plans, and planned improvement projects

Dimensions or Process Areas	What Is It?
Business Process	Plans, Programs, Budget
Systems & Technologies	Approach to Building Systems
Performance Measurement	Use of Performance Measures
Workforce	Improving Capability of Workforce
Culture	Changing Culture and Building Champions
Collaboration	Improving Working Relationships
Day-to-day Management & Operations	Managing and Operating Daily
Day-to-day Maintenance & Repair	Conducting Daily Maintenance and Repairs
Sharing and Using Data	Activities to enable sharing and use of data with sources external to TMS

Source: FHWA

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Analyzing the Results of a TMS Assessment

Systems & Technology Dimension – *what is current maturity level?*

Sub-Dimension	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimizing
Design, develop, and implement TMS improvements	Systems and technology approaches for TMS ConOps, Requirements, Structure, and Strategic Plan are ad-hoc and outside of systematic systems engineering.	System engineering is consistently employed for TMS ConOps, Requirements, Structure, and Strategic Plan, promoting the use of systems architecture standards and increasing interoperability. However, the level of documentation and training may still be limited	Systems and technology for TMS ConOps, Requirements, Structure, and Strategic Plan are standardized, documented, and interoperable. Staff is trained and educated on current and emerging technologies impacting TMS capabilities, ensuring a strong understanding of systems engineering principles and practices.	Systems and technology for TMS ConOps, Requirements, Structure, and Strategic Plan are continually upgraded and optimized to improve performance. The agency ensures that system engineering practices are adapted to support continuous improvement and maintain high levels of interoperability and standardization.
Software Subsystem	Minimal collaboration exists between TMS and IT groups. TMS may not be prioritized within IT operations	Some cooperation between IT group and TMS group. Some alignment on standards, practices, and system support.	TMS and IT technologies in alignment. Good collaboration for TMS-related tests, deployments, support, and enhancements.	Full cooperation and collaboration between TMS and IT groups. Each is involved in all major technology decisions for the TMS. TMS seen as a top priority system with IT resources supporting current and future enhancements.
Data Subsystem	TMS group uses proven technologies for the TMS. R&D is minimal. Any emerging technologies are usually met with skepticism.	TMS group acknowledge emerging technologies but adopts a "wait and see" attitude letting others deploy and approve	TMS group actively monitors emerging technologies and runs pilots to evaluate and test selected innovations	Proactive approach to R&D. The agency actively pursues advancements in technology and is an early adopter.

Source: FHWA

Analyzing the Results of a TMS Assessment

Summarizing existing capabilities of TMS dimension capabilities:
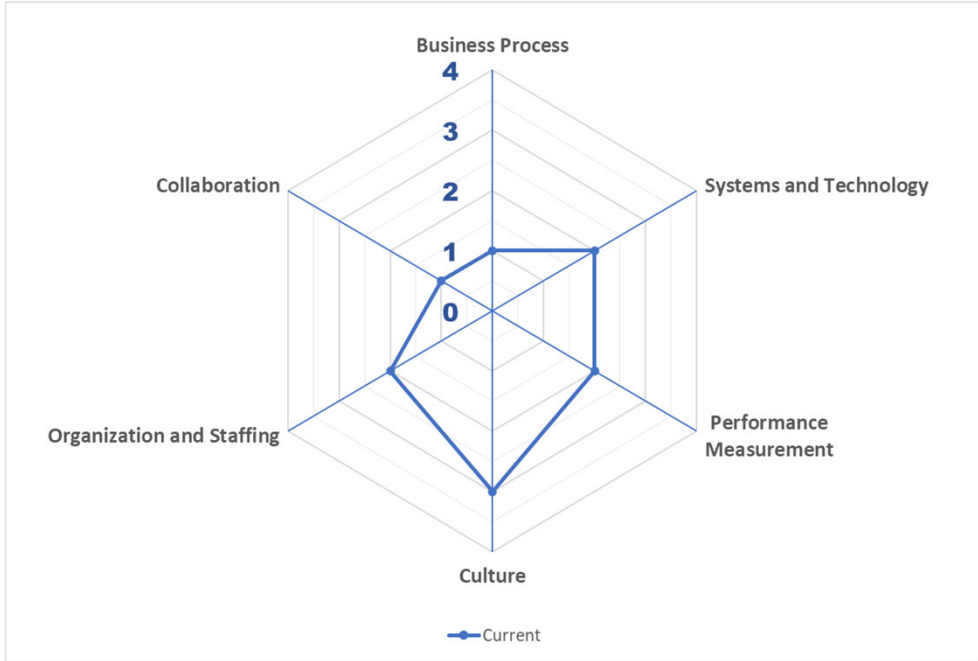
- Spider Diagram Format

- Visualize existing capability maturity across all dimensions

Source: FHWA

Analyzing the Results of a TMS Assessment

EXAMPLE: Systems & Technology Dimension improvements:

Identifying opportunities to advance capabilities for sub-dimensions and dimensions

Design, Develop, and Implement TMS Improvements			
Achieving Level 1	Achieving Level 2	Achieving Level 3	Achieving Level 4
Actions to Get to the Next Level			
	Introduce systems engineering into TMS program planning	Develop tools to support adoption of standard system engineering process	Constantly review and refine processes
	Introduce systems engineering into TMS development projects	Develop procedures to support adoption of standard system engineering process	Maintain adaptability and responsiveness to technology changes or advancements
		Develop training to support adoption of standard system engineering process	
Key Stakeholders			
	TMS champions	IT Staff Policy staff Systems integrators	IT Staff Policy staff Systems integrators

Source: FHWA

Analyzing the Results of a TMS Assessment

How do we translate assessment results into action planning?
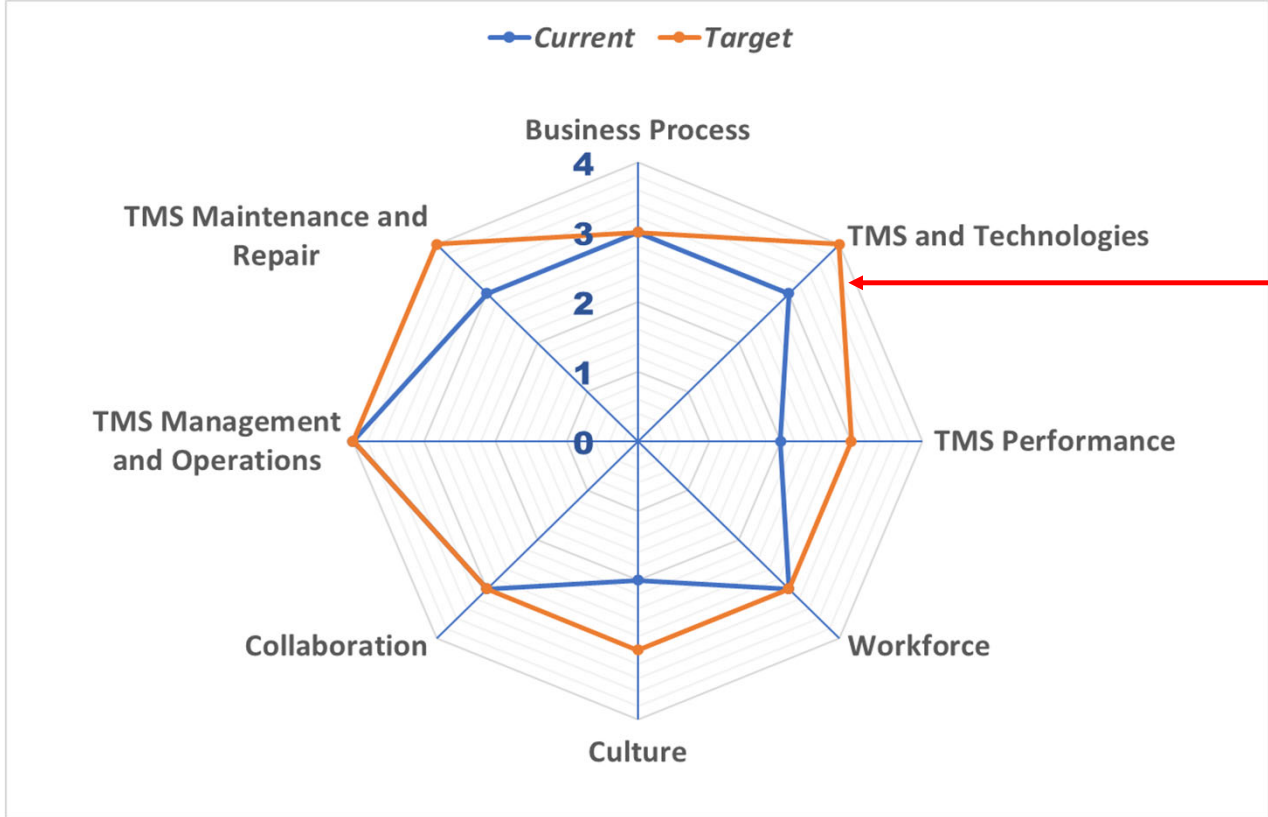
Identifying existing and desired future capability levels across these dimensions provide the basis to identify and prioritize opportunities for improvements

Source: FHWA

Assessing TMSs Capabilities and Performance

Thank you!