Transportation Asset Management Webinar Series

Webinar 71

Strategy, Planning & Resource Allocation

Sponsored by FHWA and AASHTO

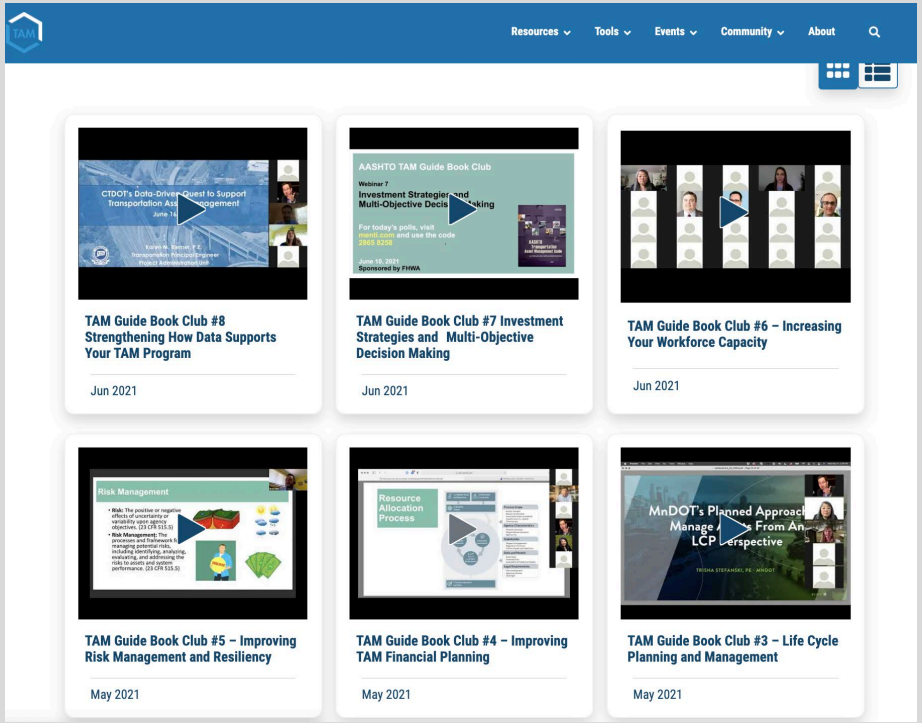
U.S. Department of Transportation
Federal Highway Administration

AASHTO
The Voice of Transportation

October 16, 2024

FHWA/AASHTO Asset Management Webinar Series

- This is the 71st in a webinar series that has been running since 2012
- Webinars are held every two months, on topics such as off-system assets, asset management plans, asset management and risk management, and more
  - Usually, the 3rd Wednesday of the month, 2PM Eastern
- We welcome ideas for future webinar topics and presentations
- Submit your questions using Zoom's chat feature



Welcome

FHWA and the AASHTO Sub-Committee on Asset Management are pleased to sponsor this webinar series

- Sharing knowledge is a critical component of advancing asset management practice
- FHWA Asset Management Hub: https://www.fhwa.dot.gov/asset/pubs.cfm

Webinar Objectives

- Learn about the TAM Guide Chapter 2 – TAM Strategy and Planning and TAM Guide Chapter 5 – Resource Allocation.
- Highlight the implementation of MnDOT's Strategic Action Plan and lessons learned.
- Feature best practices from Utah DOT regarding asset valuation.

Webinar Agenda

2:00 **Welcome, Overview, and Agenda**
Christos Xenophontos, AASHTO CPBM
Tashia Clemons, FHWA
Hyun-A Park, Spy Pond Partners

2:10 **TAM Guide Chapter 2: TAM Strategy and Planning Overview of Enhancements**
Martin Gordon, WSP

2:25 **Minnesota TAM Strategic Action Plan**
Trisha Stefanski, Minnesota DOT

2:40 **TAM Guide Chapter 5: Resource Allocation**
William Robert, Spy Pond Partners

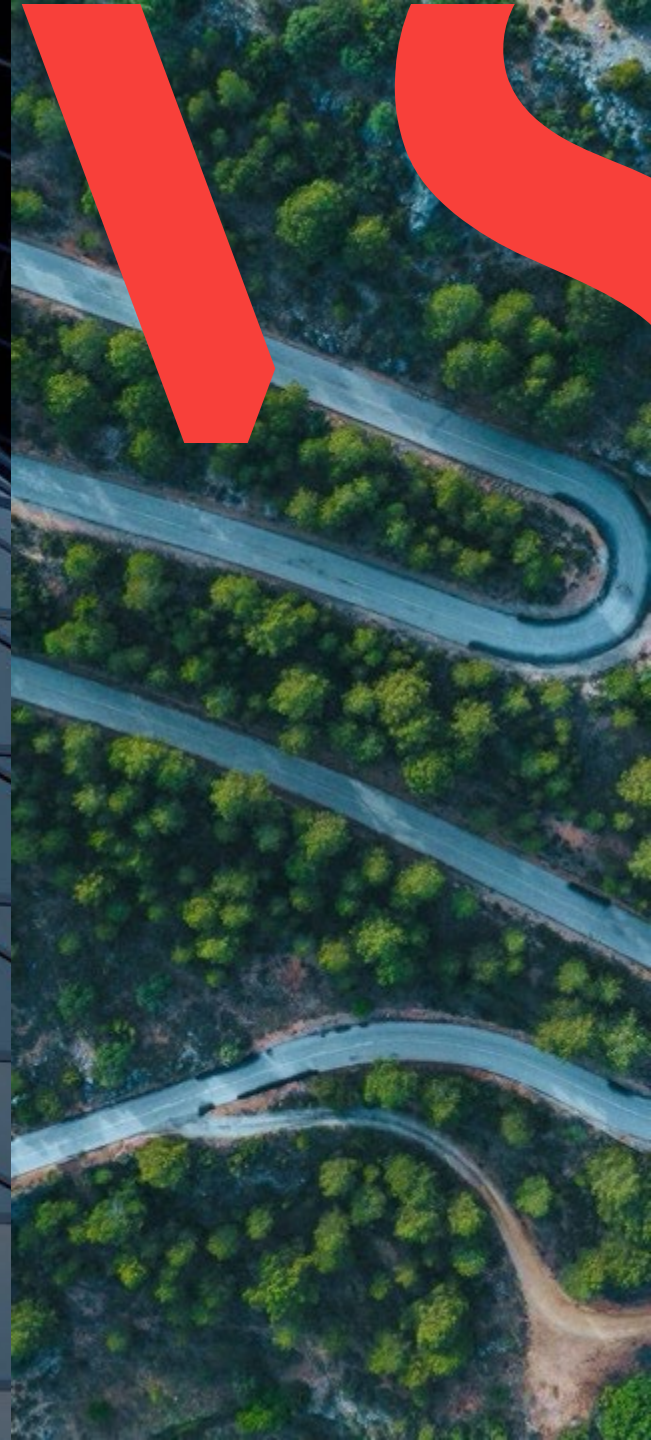
2:55 **Utah DOT Asset Valuation**
Chris Whipple, Utah DOT

3:10 **Q&A, Discussion and Next Steps**
Hyun-A Park, Spy Pond Partners
Christos Xenophontos, AASHTO CPBM

The AASHTO TAM Digital Guide: Overview of Chapter 2

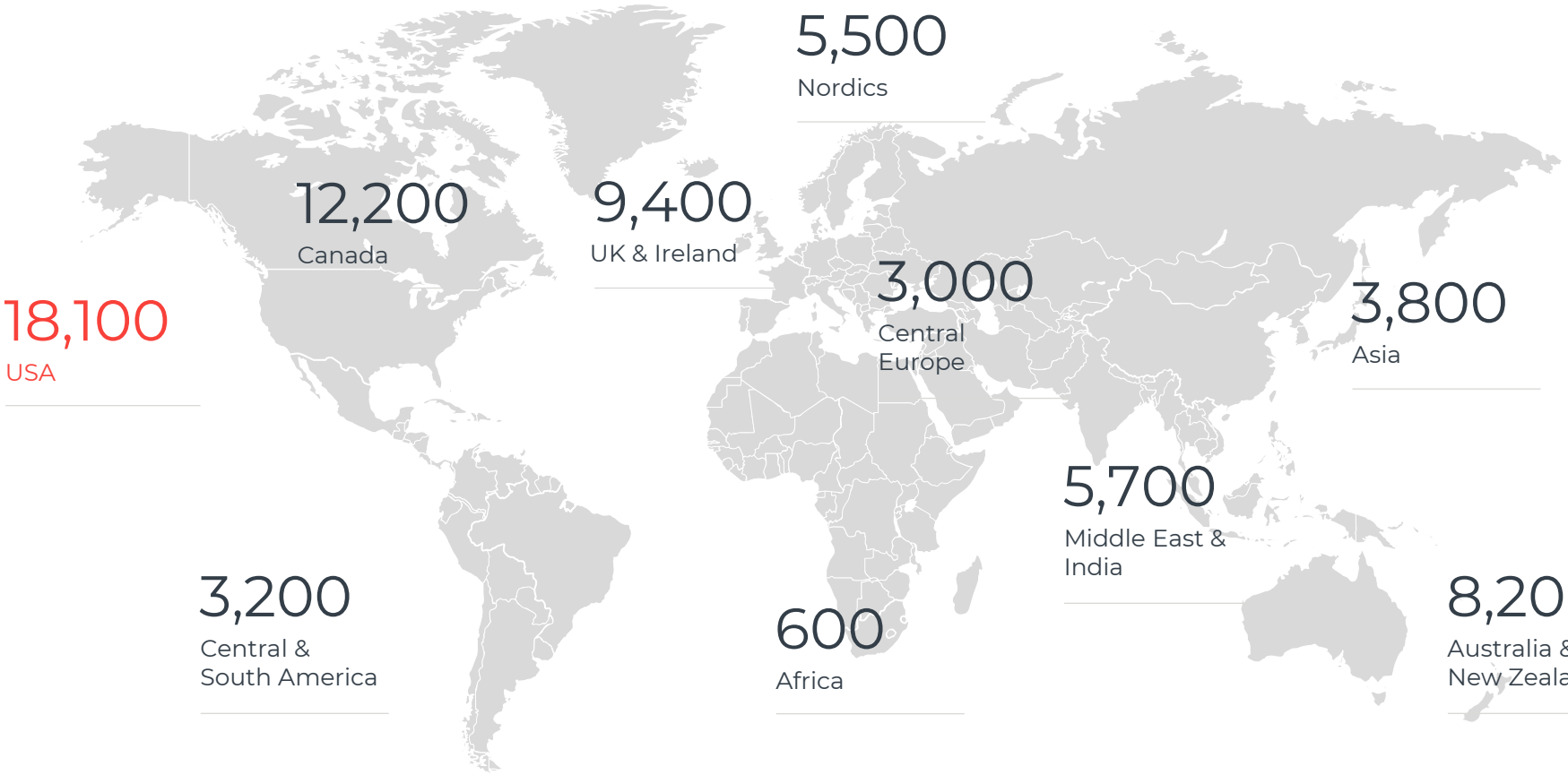
Martin Gordon, Senior Principal, WSP Inc

2024/ Oct/ 16



WSP Global

66,500
Employees Worldwide



What is Chapter 2 All About?

2.1 Developing a TAM Strategy

Linking to agency strategic documents and the AM policy

2.2 TAM Integration

Integrating performance, risk and resilience into how agencies do planning and programming and supporting data / analysis.

2.3 TAM Assessment and Advancement

Assessing agency AM practices and having a plan to improve.

2.4 Developing a TAMP

Elements of a basic TAMP and how to take steps beyond basic.

2.5 Beyond Pavements and Bridges

Ancillary assets, and management considerations

2.6 Incorporating Equity into TAM

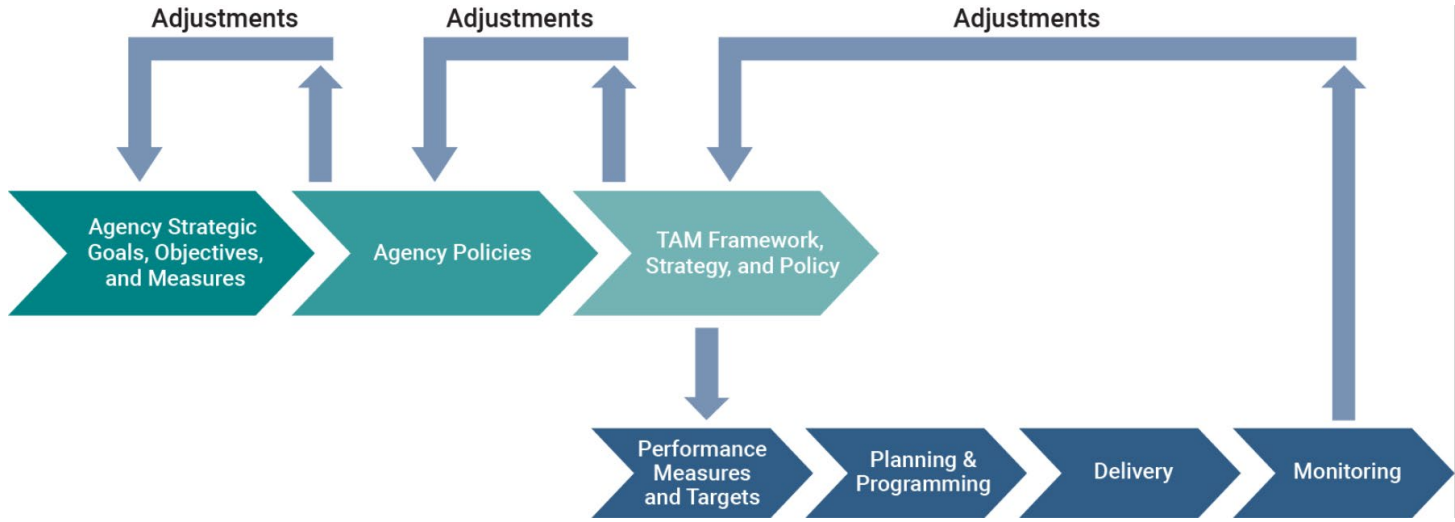
Understanding Equity and how to integrating into TAM practices

What's New?

Section 2.1 Developing a TAM Strategy

New Video Resources

- Integrating PM2 Targets with the TAMP, AASHTO TAM Webinar #34
- Integrating Effective Performance, Risk, and Asset Management, Mara Campbell
- Strategic Framework for Asset Management, Meredith Hill



What's New?

Section 2.2 TAM Integration

New Video Resources

- Using the TAMP Approach to Look at Demand Scenarios, Jack Smith
- Integrating TAM Into the Planning Process, FHWA TAM Expert Task Group
- Improving Risk Management and Resiliency, AASHTO TAM Guide Book Club #5
- Risk Management, AASHTO TAM Webinar #27

New Section: Connecting Resilience with Asset Management

1. Develop Resilience Objectives and Targets
2. Identify Risk
3. Assess Risk
4. Identify and Implement Resilience Strategies
5. Integrate Resilience Strategies into TAM planning
6. Monitor and Evaluate Resilience

Associated New Video Resources

- TAM Resilience Building: Takeaways from the TAM Peer Exchange, AASHTO TAM Webinar #60
- Resiliency and the IIJA, AASHTO TPM Webinar #27

Section 2.3 TAM Assessment and Advancement

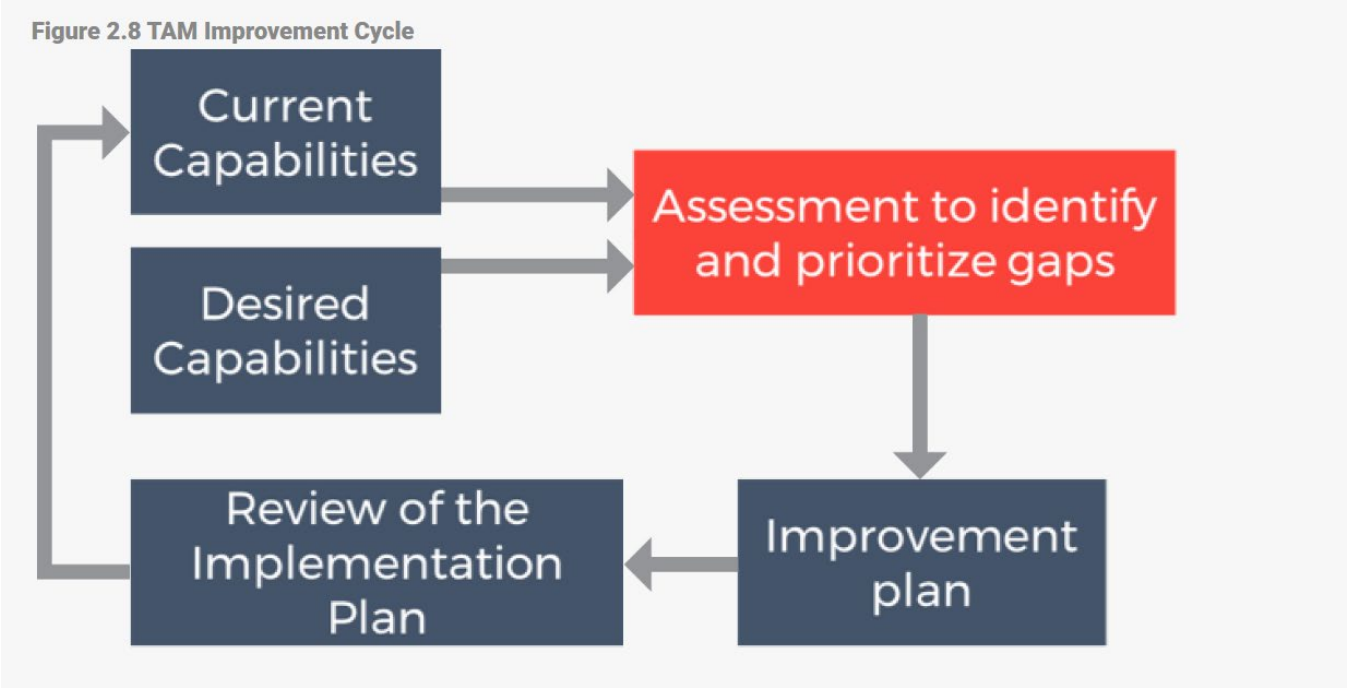
New Video Resources

- TAM Innovations, AASHTO TAM Webinar #31
- TAMP Implementation, AASHTO TAM Webinar #39

Existing Sections

- Assessing Current Practice
- Defining and Prioritizing Improvement in TAM Approaches
- Developing a TAM Implementation Plan
- Monitoring TAM Program Improvements

Figure 2.8 TAM Improvement Cycle



What's New?

Section 2.4 Developing a TAMP

New Video Resources

- The 2022 TAMPs and BIL Requirements, AASHTO TAM Webinar #58
- Developing a Complete TAMP, AASHTO TAM Webinar #35
- Improving Your Next TAMP Miniseries – Overview, AASHTO TAM Webinar #46
- 2022 TAMPs – Lessons from Practitioners, AASHTO TAM Webinar #53
- Preparing for Your 2022 TAMP with the TAM Guide, AASHTO TAM Guide Book Club #1
- TAM Tools Miniseries 02 – Management Systems, AASHTO TAM Webinar #55
- TAMP Implementation and Integration, AASHTO TAM Guide Book Club #2

Existing Sections:

1. The Basic TAMP
   - TAMP Requirements
   - TAM Policies, Goals, and Objectives
   - Asset Inventory and Condition
   - Life Cycle Planning Approach
   - Predicted Asset Condition
   - Investment Plan
   - Risk Management
2. Beyond the Basic TAMP
   - TAMP Scope
   - TAM Implementation Plan
   - TAM-Related Business Processes

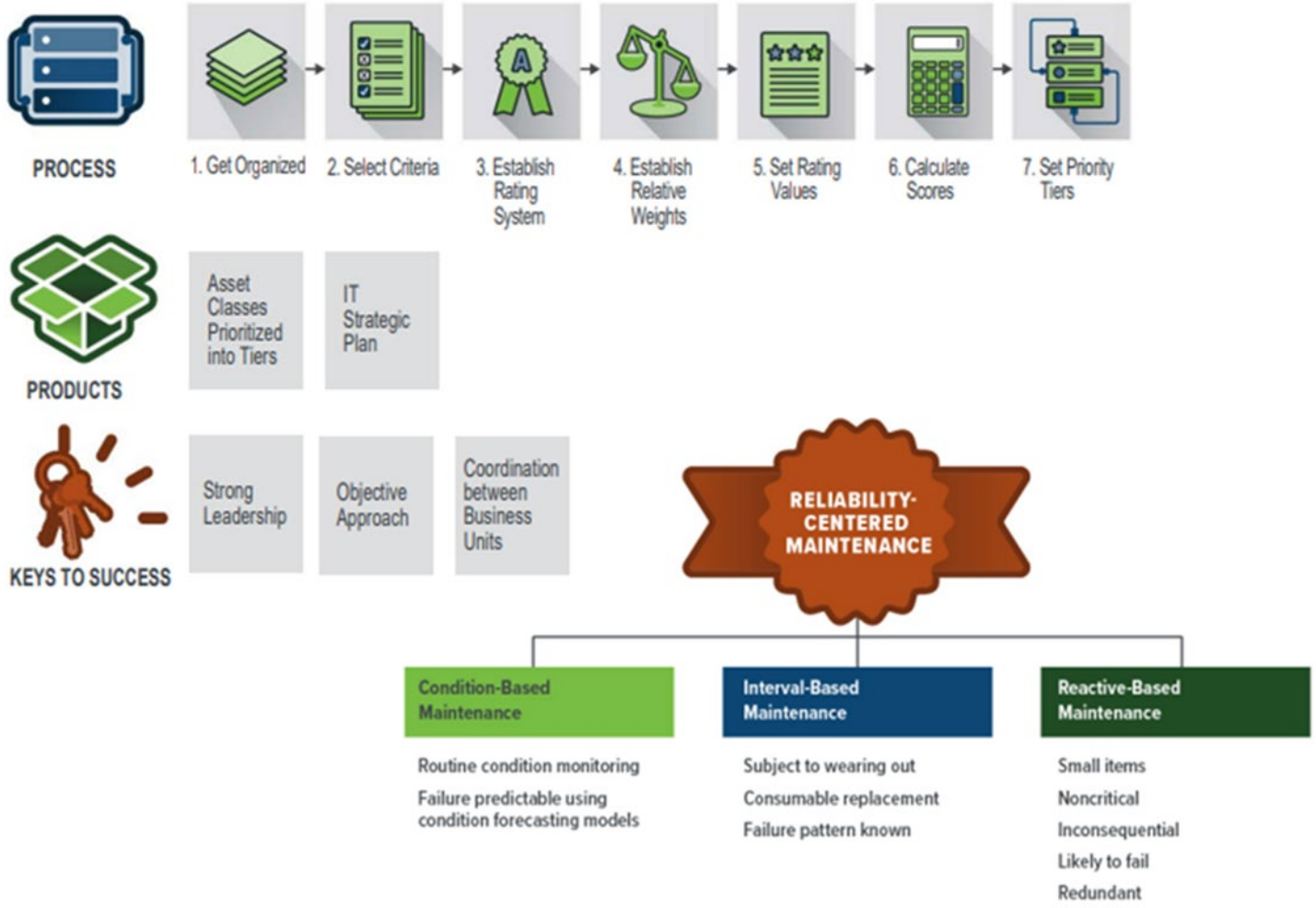
Section 2.5 Beyond Pavements and Bridges

New Section:

1. Drivers for Including Ancillary Assets
2. Selecting Assets for Inclusion in Asset Management Programs
3. Data Collection
4. Data Required for Decision-Making
5. Managing Ancillary Asset Data

New Resources

- Video: Geotechnical Assets and TAM, AASHTO TAM Webinar #43
- Practice Example: Vegetation Control / Yukon Department of Highways and Public Works



Section 2.6 Incorporating Equity into TAM

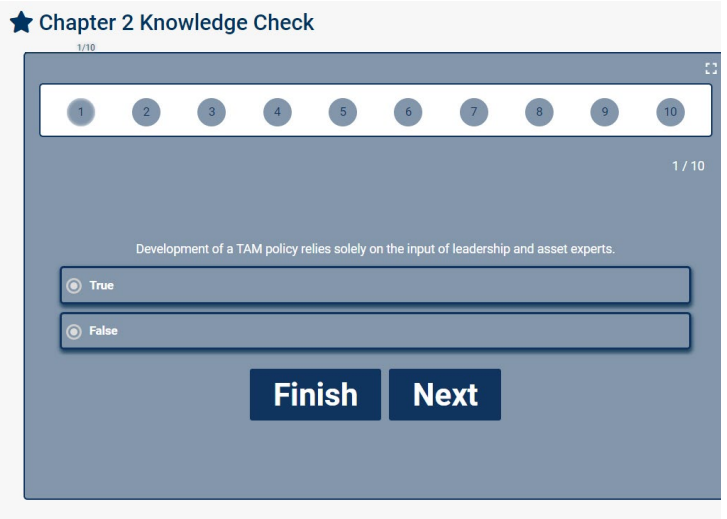
New Section:

1. Understanding Equity
2. Integration Equity in TAM Practices

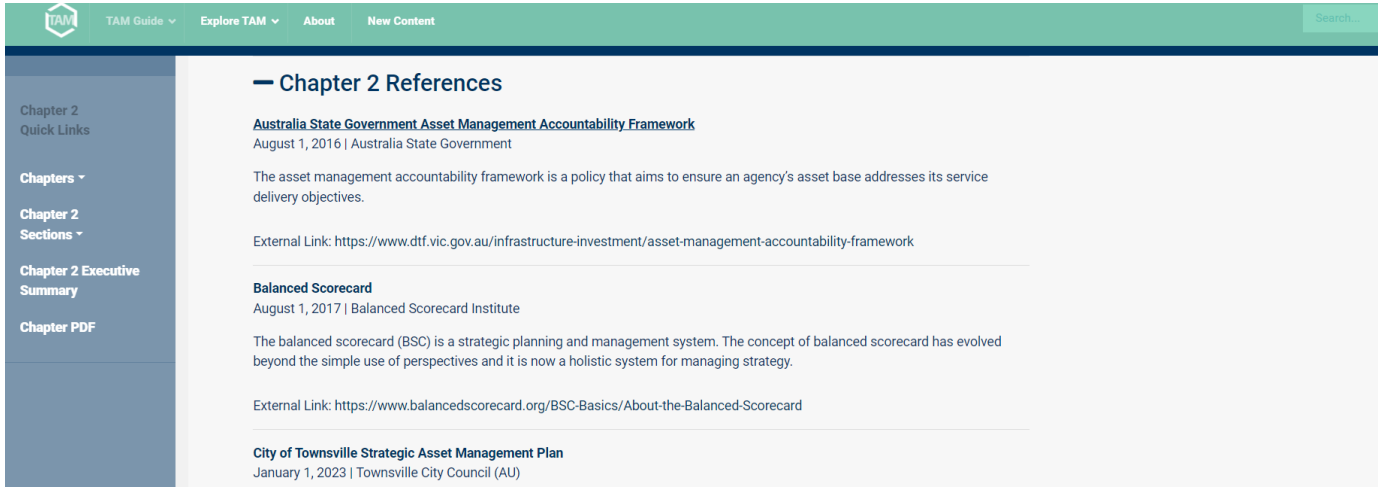
New Resources

- Video: TPM and Equity, AASHTO TPM Webinar #11
- Practice Example: Integrating Equity in Transportation Decision-Making

Chapter 2
Knowledge Check



Chapter 2 References



Thank you

wsp.com

TAM Strategic Action Plan

Trisha Stefanski, P.E.
Asset Management Program Office Manager

What Led Up To MnDOT's TAM Strategic Action Plan (AMSIP)?

2015

Dedicated Champion & Centralized Staff: Asset Management Program Office

- Planning Division

2016

Data Management: Enterprise Asset & Maintenance Management System

- Ancillary Assets, Damage Restitution, Maintenance Focus

2019

Maturity Assessment: Asset Mgmt "Gap" Workshop

- Long-range planning, TAMP Assets, PM Barriers, Resource Concerns, Responsibilities, Use of Data

2020

Legislative Mandate: Mn State Statute 174.03 Subd. 12

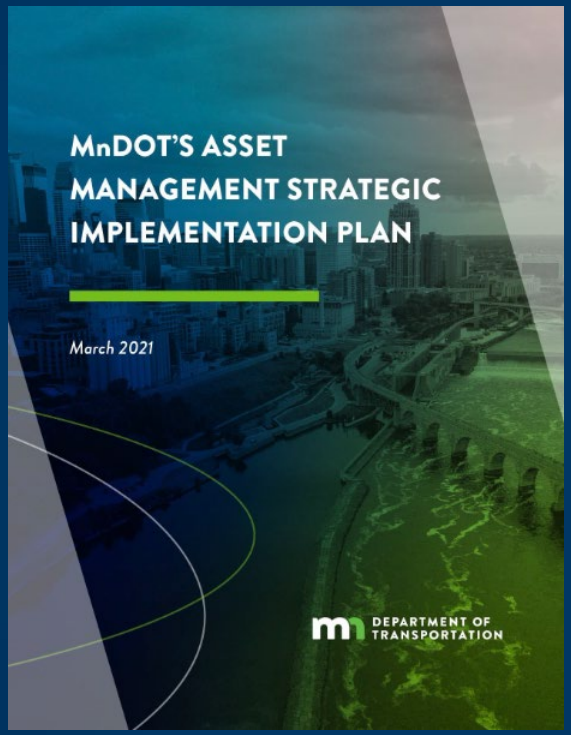
- "Commissioner must… inventory of … bridge, pavement, geotechnical, pedestrian, bicycle, and transit…

2021

Asset Mgmt Strategic Implementation Plan (AMSIP)

- Geotechnical, TAMP, Preventive Maintenance, Data, Communication

So Much VALUE in MnDOT's Strategic Plan Process



- Targeted Improvement Areas
  - Gain Trust
    - Establish Transparency
      - Meet State Statute
        - Increase Maturity Towards MODA
          - Cross-Agency Stakeholder Collaboration
            - Dedicated AM District Specialists

Asset Management Strategic Implementation Plan Mission and Objectives

At MnDOT, transportation assets are managed effectively based on risk and return on investment, using the best available information and tools.

Use Data Effectively	Improve Trade-off Evaluation	Integrate AM into MnDOT's Culture

The three strategic objectives led to the development of the five work groups:

1. Use data effectively to strategically manage investments and assets, within available resources, in a proactive and wholistic way to reduce life-cycle costs and maintain the value of our most critical assets.

2. Improve the ability to evaluate trade-offs between investment options in a consistent and transparent way that maximizes system performance.

3. Integrate asset management into MnDOT's culture through effective communication and a workforce with the skills needed to successfully fulfill their asset management duties and responsibilities.

Thank you, AP Tech and Spy Pond Partners for leading the MnDOT AMSIP!

Building Maturity

Communication

Asset Matrix

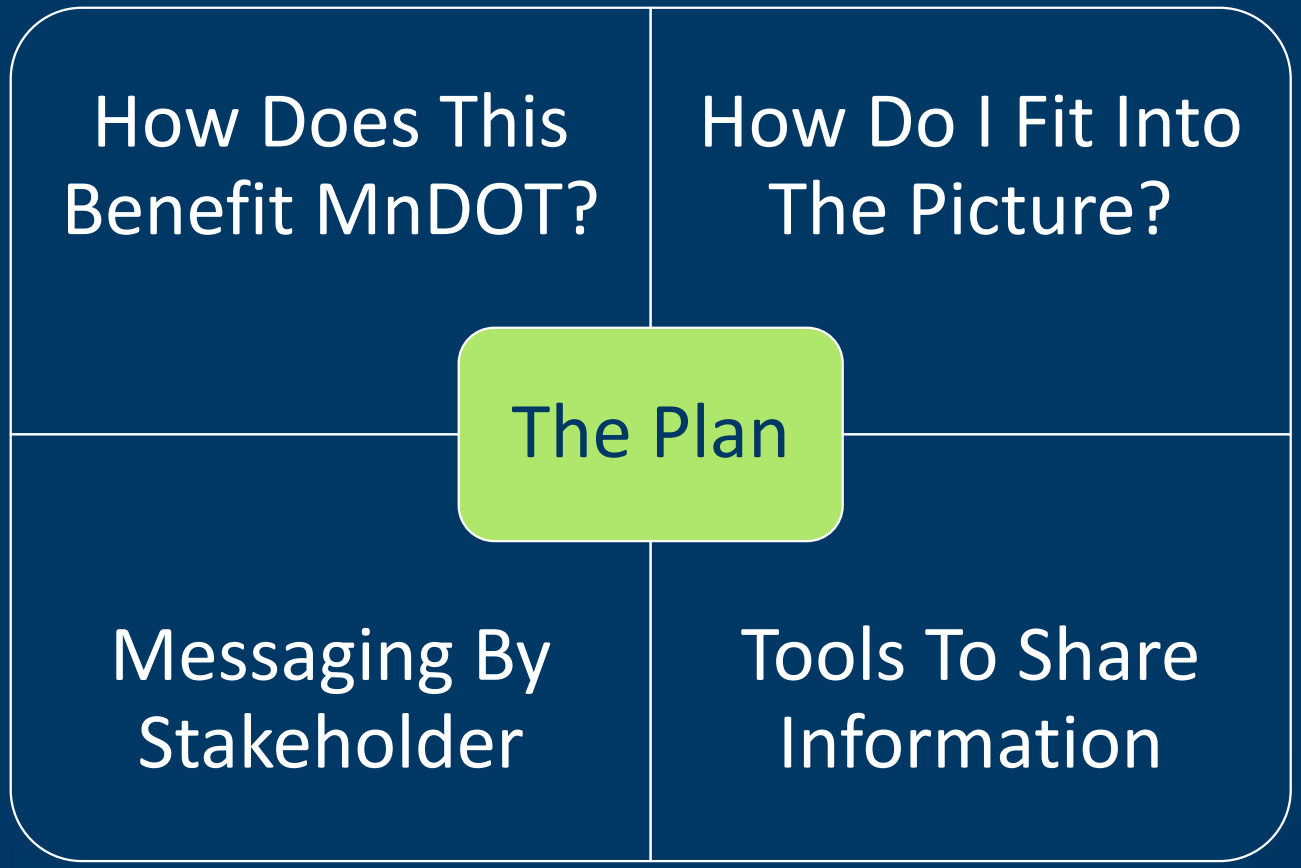
TAMP

Geotechnical Assets

Pavement Preservation

TAM Communication

The Challenge: The Asset Management discipline engages well over ½ departments' employees at some level and stakeholders have varying levels of information needs.

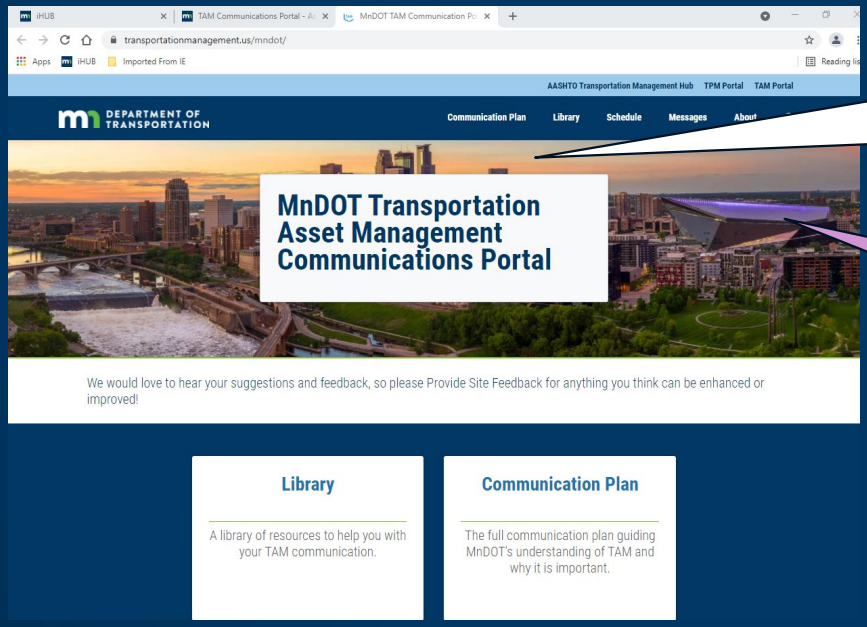


TAM Communication

Stage 1
- Executive Leadership
- Senior Leadership

Stage 2
- Office Directors
- Direct Reports

Stage 3
- District Leadership
- Direct Reports

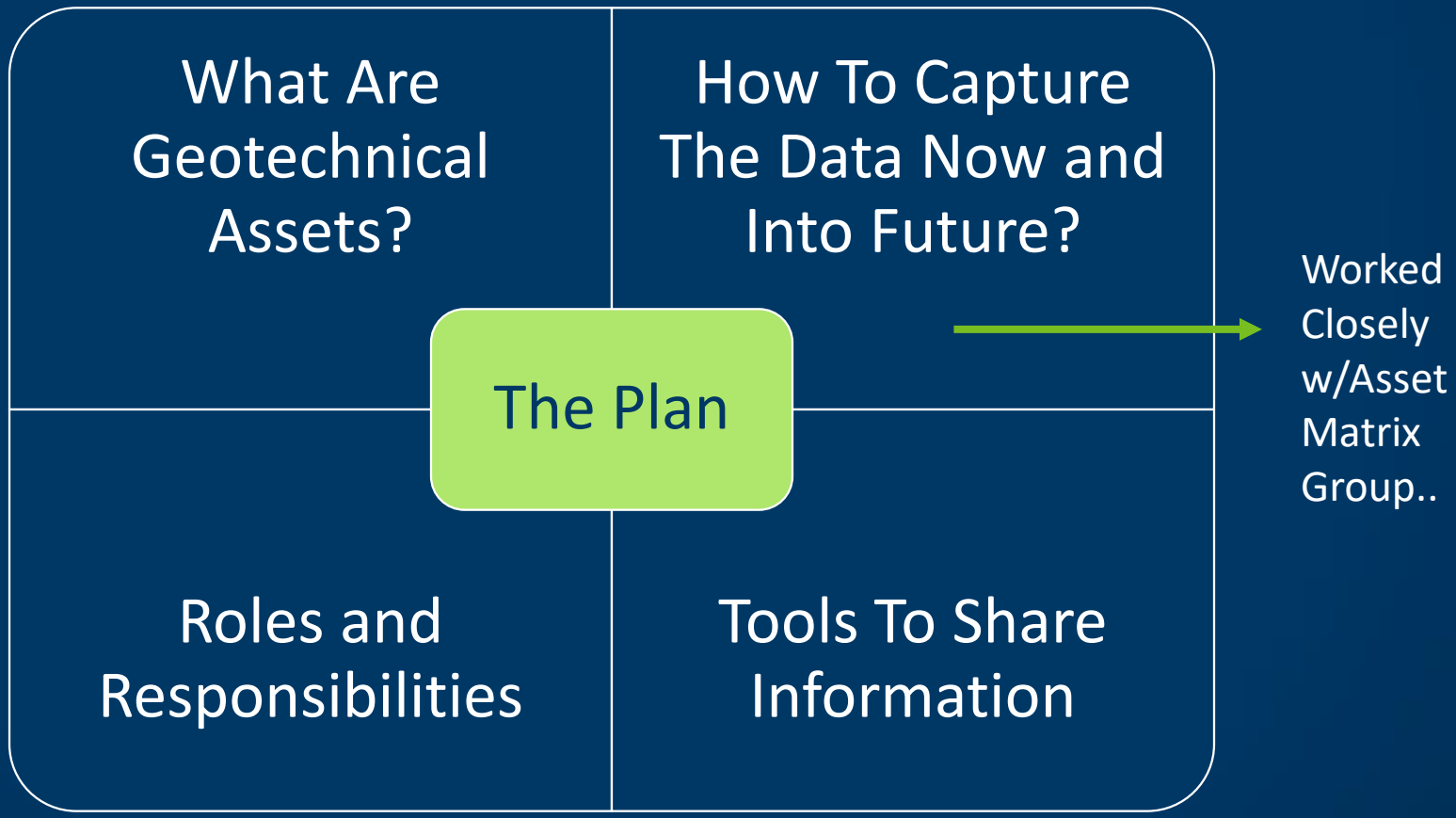


Ahh.. Now I Understand Why Asset Management is Important and What I Can Do To Help.

Have You Heard, The Vikings Are 5-0 This Year!

Geotechnical Assets

The Challenge: Evaluate options for MnDOT's response to meet the legislative mandate to manage geotechnical assets.



Geotechnical Assets

- Earth Retaining Structures (ERS)
- Slopes
- Embankments
- Subgrade
- Special Drainage
- Instrumentation
- Natural Hazard Locations

1 Establish Categories

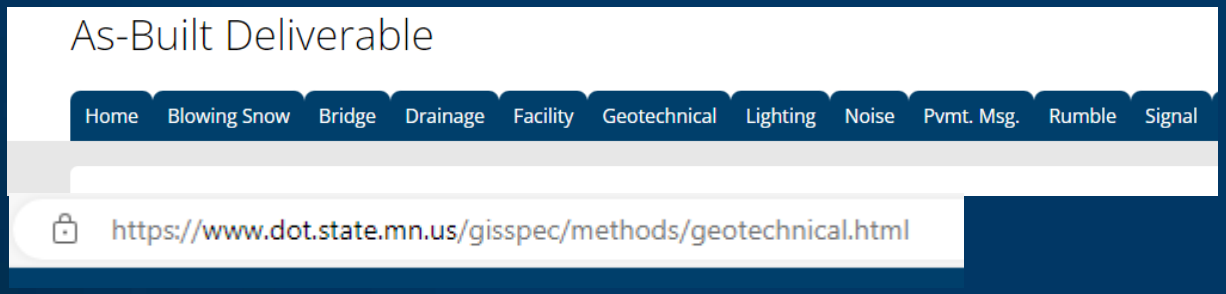
2 Maintenance Approach

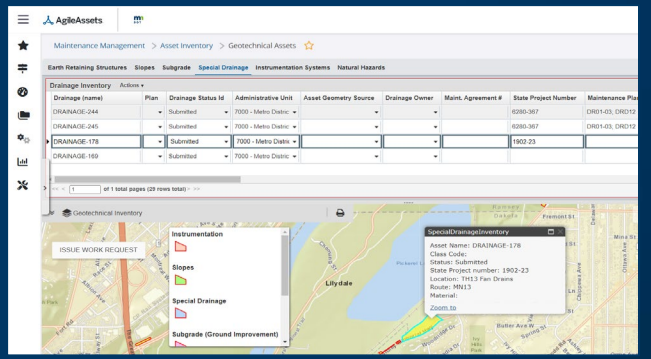
3 GIS Tool

4 Inventory

5 EAM Configuration

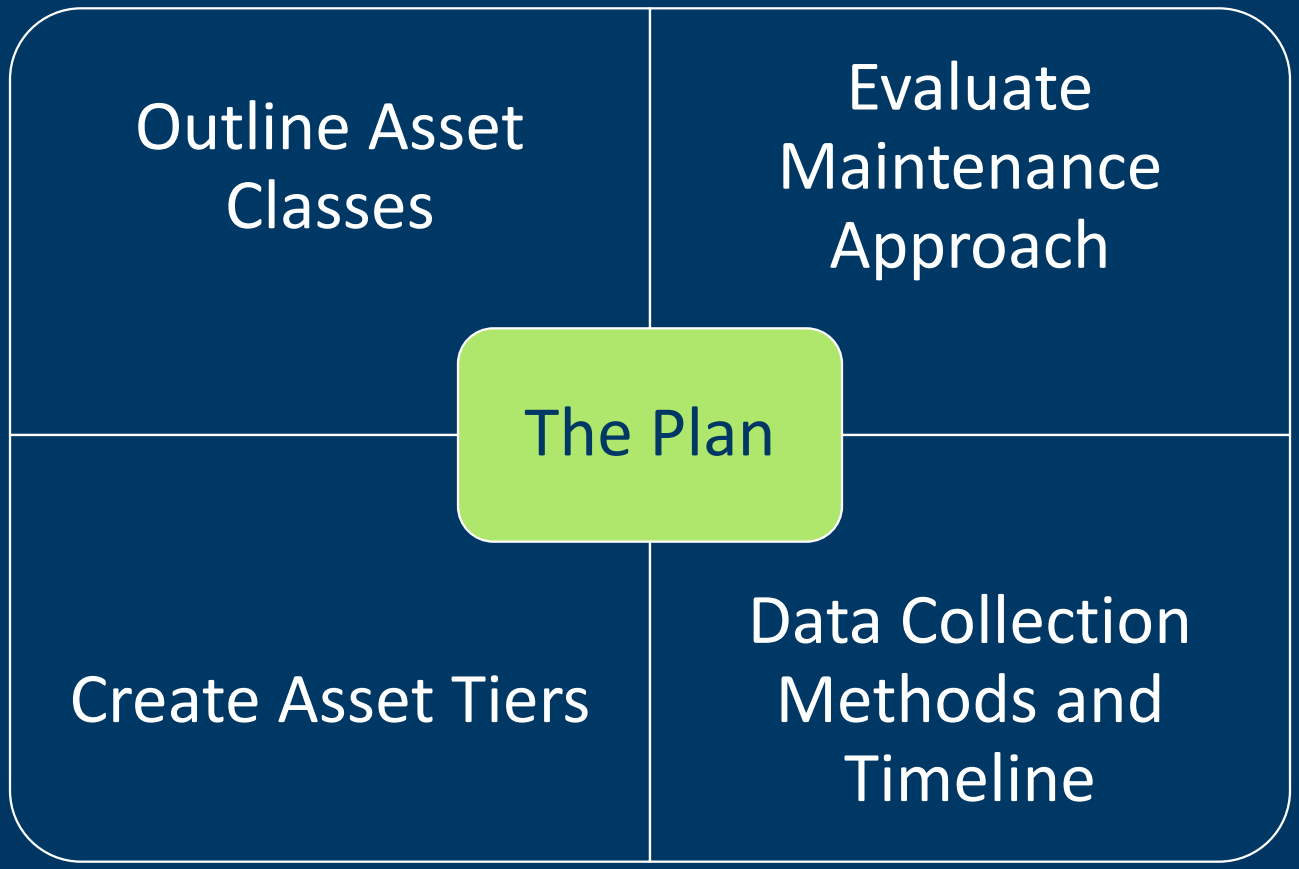
6 As-Built Specification





Asset “Matrix”

The Challenge: Establish a prioritized approach for managing assets that considers the different ways that assets are maintained, their importance to the agency, and the risks associated with their failure.



Asset "Matrix"

Matrix Drivers				Plan summary	Baseline Inventory		Inv. Currency	Condition Inventory	
Asset Group	Asset Class	Tier	Desired AM Approach	Short Description	Timeline To Complete Inventory	Inventory Baseline Cost Estimate	Inventory Currency Annual Cost Estimate	Timeline To Complete Inspection Cycle	Inspection Plan - Annual Cost Estimate (Baseline
Bike and Ped	Accessible On-street ADA Parking	2	Condition	Add	<1 year	$ 3,000	$ 1,000	3 to 5 years	$ 4,000
Bike and Ped	Bike Lane (not sep) and shared roadways	2	Condition	Add	NA	$ -	$ -	3 to 5 years	$ 20,000
Bike and Ped	Shared use paths, side paths, sep bike lanes	3	Cycle	Add	NA	$ -	$ 20,000	3 to 5 years	$ 20,000
Geotechnical	Earth Retaining Systems (includes gravity, soil	2	Condition	Add	<1 year	$ 27,000	$ 8,000	3 to 5 years	$ 188,000

Priorities :

- ✓ Inventory Side and Mainline Culverts
- ✓ Refresh State's Sign Inventory and Inventory Above Ground Assets
- ✓ Annual LiDAR Projects To Capture Construction Project Data

Collecting Side and Mainline Culvert Data – ROI yielded net present value of $23K with 7-year payback period.

Right-Sizing:

- ✓ Discontinue investment in data collection for mowing, embankments, curb and gutter, gravel shoulders, and roadway ditches.

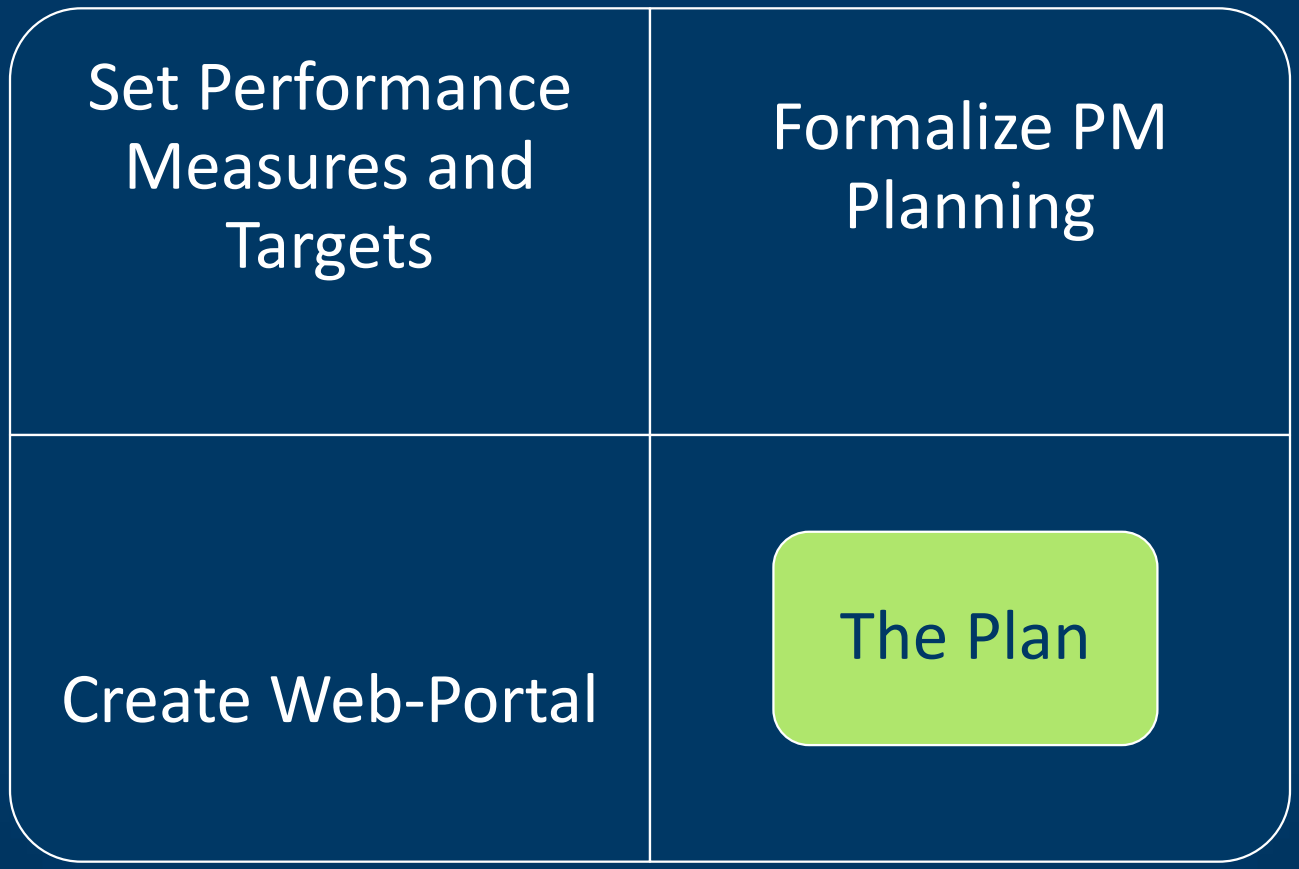
Asset Inventory Collection via lidar is ~½ the cost of GPS field collection.

Connect The Dot's and Move to Building/Asset Information Modeling:

- ✓ MnDOT Recipient of NiceConnect Advanced Digital Construction Management System Grant

Pavement Preservation

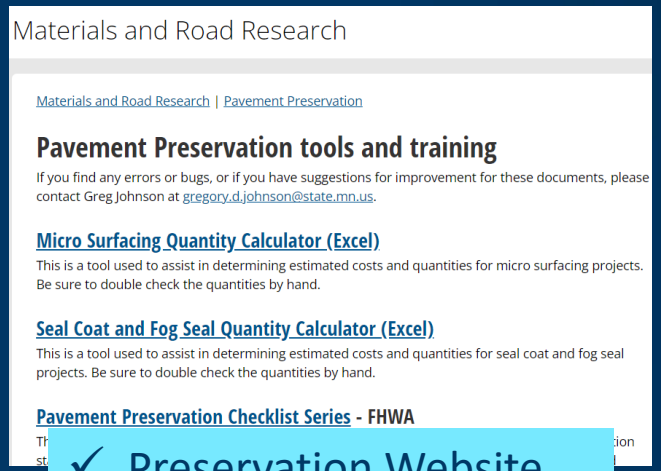
The Challenge: Establish a plan for increasing the reliable use of pro-active preventive maintenance treatments to preserve asset conditions and reduce the life-cycle cost of managing assets.



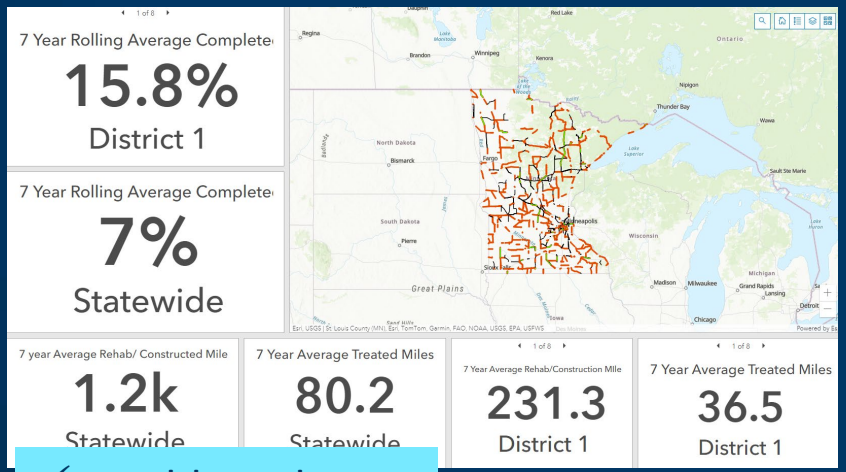
Pavement Preservation

PM Treatment	Application Guideline	Performance Target
Crack Fill/Rout & Seal	Treat bituminous overlays and new pavements by **year five**. Exclude super commuter (>30,000 AADT) roadways. Pavements with minor cracking may be excluded from the measure	80%
Bituminous Surface Treatments "BSTs"	Apply full-width thin surface treatments to bituminous pavements by **year seven**. Target based on seven-year rolling average. (medium overlays >2" and new pavements)	80%
Light CPR, can include Diamond Grinding	Perform minor CPR and/or diamond grinding on concrete pavements when **RQI ≤ 3.0 or SR ≤ 2.7**. Exclude urban area pavements with speed limit ≤ 45 mph.	70%
Seal longitudinal edge joint	Seal Longitudinal edge joint between concrete pavement and bituminous shoulder by year 5 and at 5-year intervals thereafter.	80%

✓ Performance Measures



✓ Preservation Website



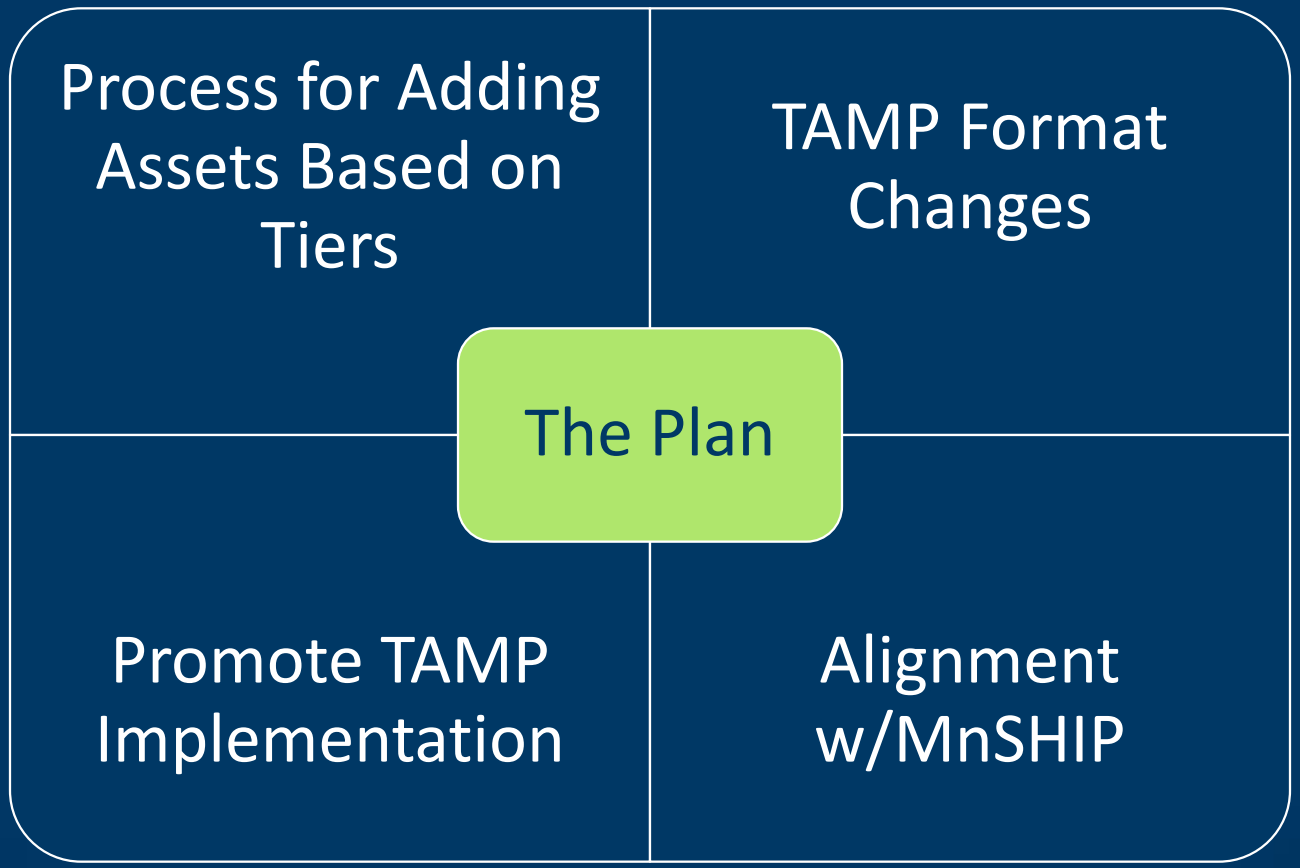
✓ Dashboards

- ❑ PM Solidified Lighting/Signals/OSS
- ❑ Utilize Management Systems Outputs to support District Planning efforts
- ❑ Include in STIP development guidance in future years
- ❑ Integrate Maint. & Capital investments

❑ To Do List

Transportation Asset Management Plan

The Challenge: Recommend changes to the TAMP that improve life-cycle implementation, increase effectiveness, and strengthen MnSHIP interrelationship.



Transportation Asset Management Plan

<u>Asset Addition Criteria</u>
Tier 1 or 2 Asset
Data Readiness
Key Expert Willingness

Adding
Ground Mounted
Sign Structures 2026

<u>TAMP 2026 Enhancements</u>
1. Risk and Resilience Strategies and Mitigation Scoring Process
2. Asset Valuation
3. Life-cycle Analysis For All Assets
4. Equity in Transportation Asset Management
5. Implementation of TAMP

Take Away's

- Identify Gap Areas and Champions
- Communication is Key
- Start Small Just To Get Started
- Include Decision Makers

- Dedicated Commitment (for example, Matrix)
- Strategic Implementation Plan (Action Plan)
- Request Funding and/or Resource Needs
- Help Set Individual Asset Data Resource Allocation, TAMP/District/Maintenance Asset Performance Targets & LOS. Next step; MODA.

Thank you!

What Can Asset Management Do For You?

trisha.stefanski@state.mn.us

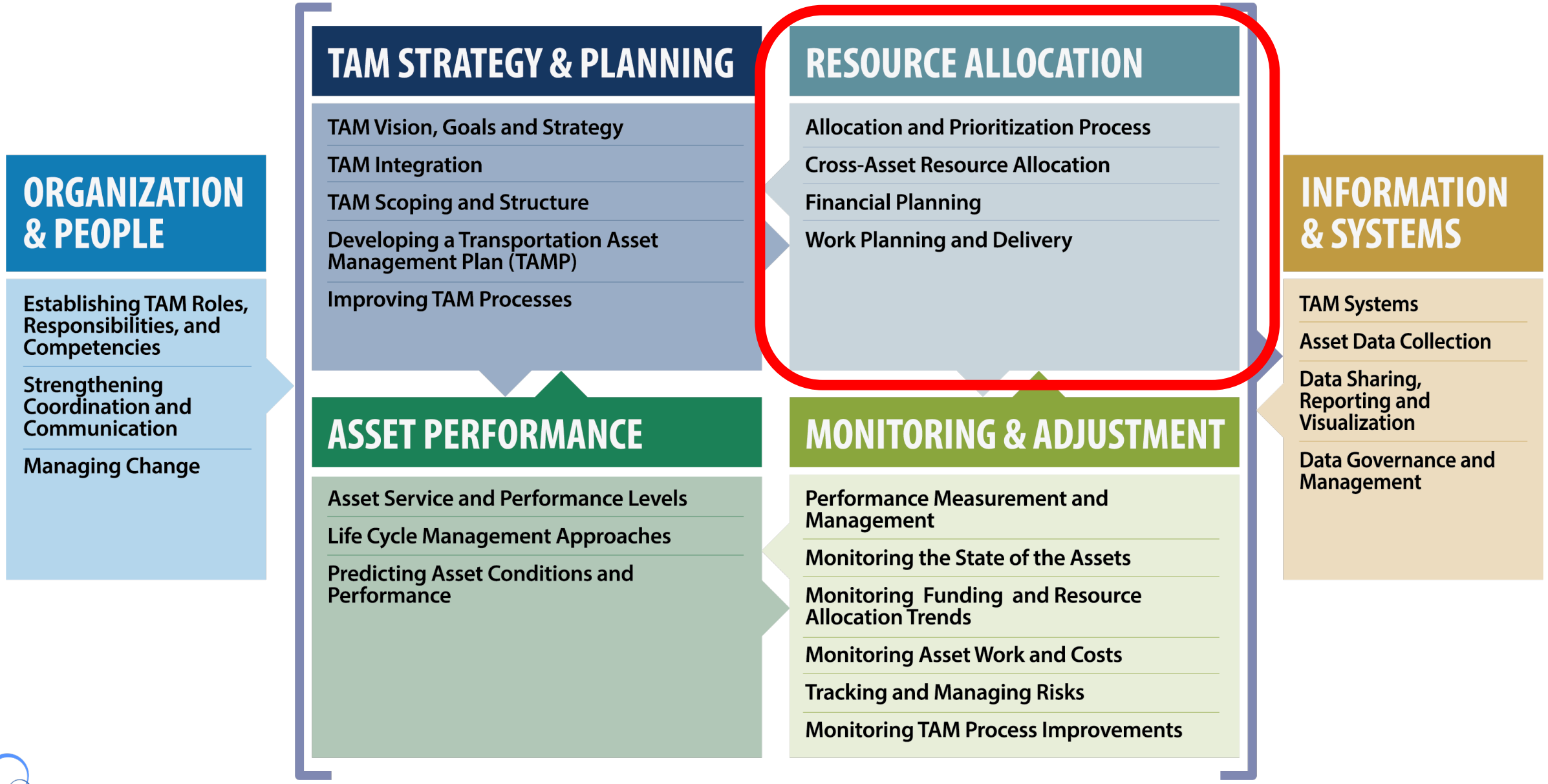
NCHRP 08-137

Updates to the Digital Edition of the AASHTO Transportation Asset Management Guide

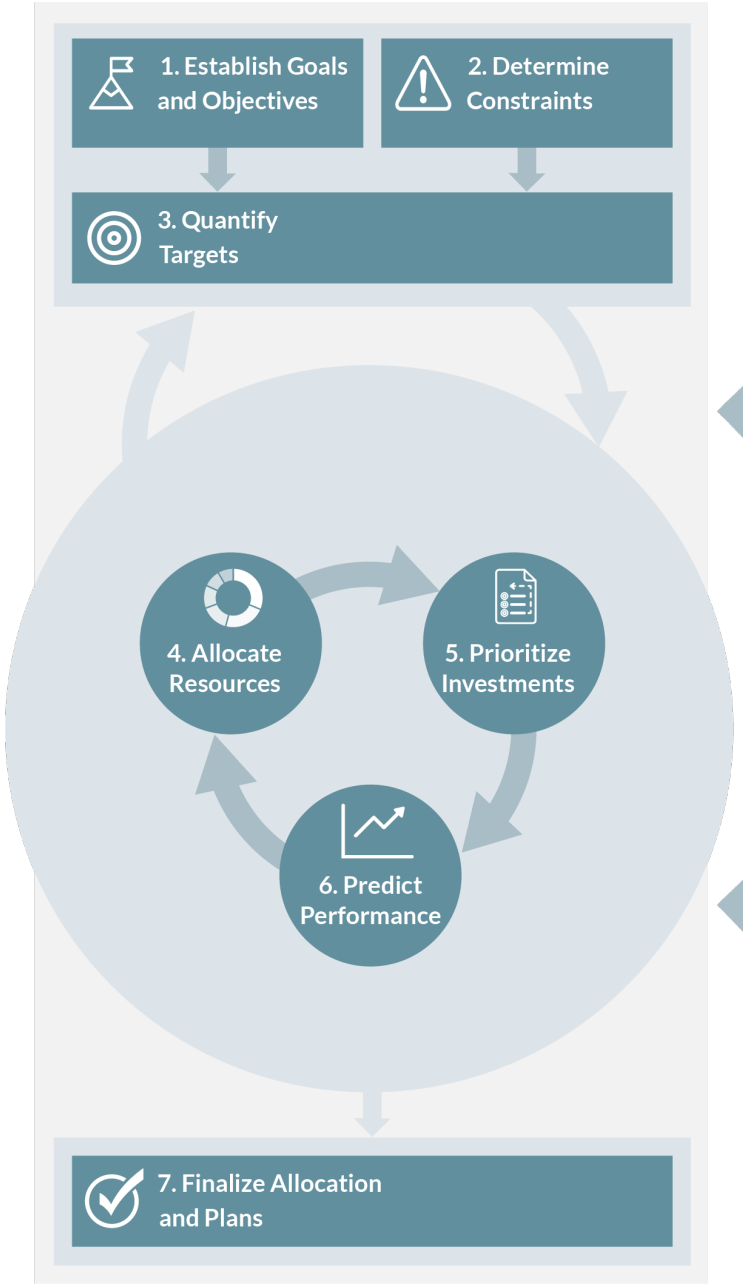
October 16, 2024

spy pond partners, llc

TAM Guide Framework



Resource Allocation Process



Process Scope

- Assets included
- Resources allocated
- Investment types considered (maintenance vs. capital)
- Time horizon

Agency Characteristics

- Diversity of assets
- Organizational structure
- Agency size

Stakeholder

- Degree of engagement
- Alignment of mission
- Clarity of goals and objectives

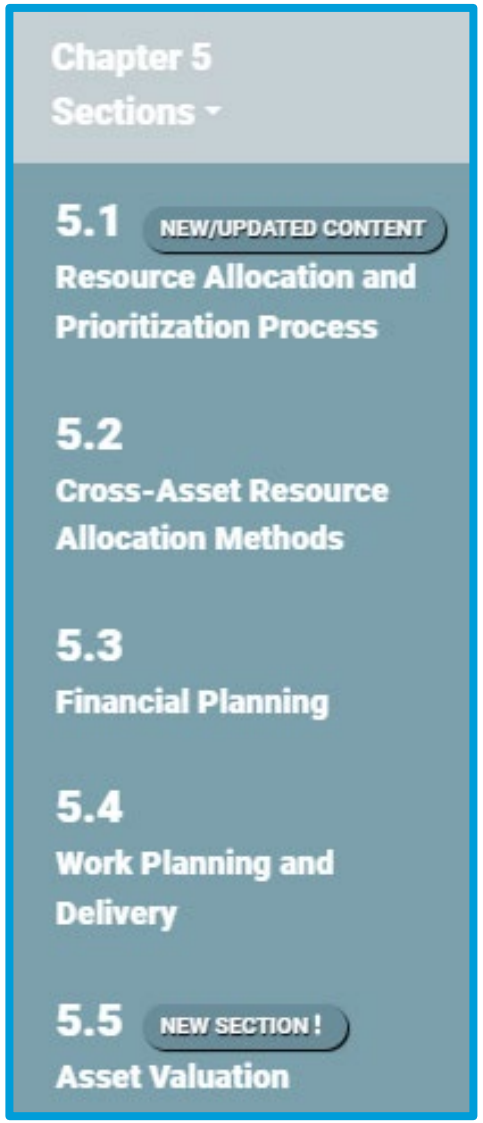
Data and Models

- Asset Data
- Financial Data
- Availability of Predictive Models

Legal Requirements

- Plan development
- Approval process
- Oversight

Chapter 5: Overview of New Materials



- Resource Allocation and Prioritization
  - New discussion on consideration of risk
  - Links back to the risk risk management process described in Chapter 2
- Asset Valuation
  - New section
  - Describes approaches for valuing assets to support TAM
  - Adapts materials from the Asset Valuation Guide developed through NCHRP Project 23-06
- Other updates
  - Asset Valuation Checklist
  - Videos
  - References

Content Addition: Section 5.5 - Asset Valuation

Section 5.5 NEW SECTION

Asset Valuation

Asset value is an important piece of financial reporting and TAM. It can be used in financial statement balance sheets, it communicates what an agency owns and maintains, and it supports investment decisions. Financial reporting standards and requirements dictate how to perform the calculations; however, in practice, there is no single correct way to measure an asset's value.

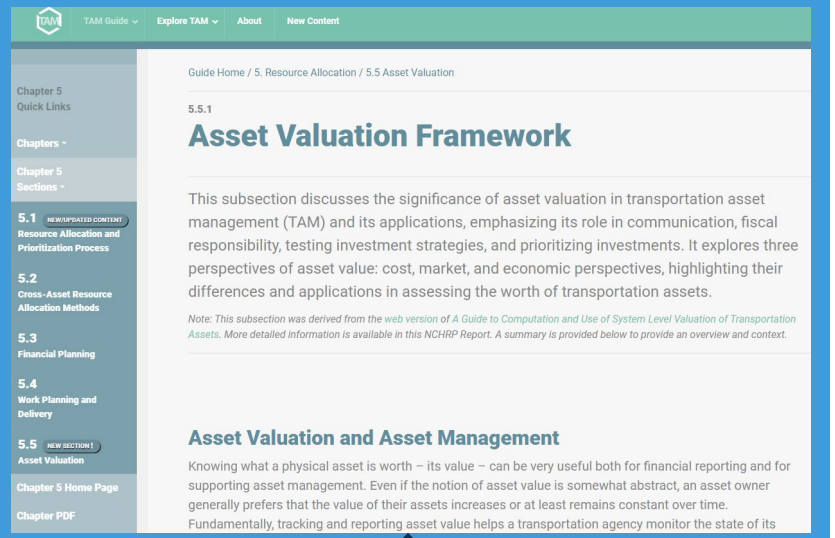
Note: This section was derived from the web version of NCHRP Web-Only Document 335: A Guide to Computation and Use of System Level Valuation of Transportation Assets. More detailed information is available in this NCHRP Report. A summary is provided below to provide an overview and context.

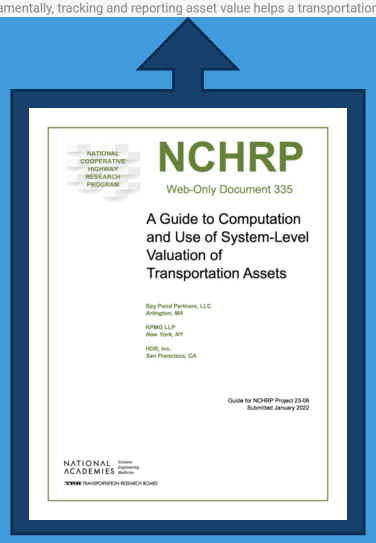
Section 5.5 Home	5.5.1	5.5.2

This section has the following parts:

1. **Asset Valuation Framework**. This section provides a framework approach for Asset Valuation and Asset Management.
2. **Using Asset Value to Support TAM Decisions**. This section details how Asset Valuations can be used to inform TAM Decision-Making.

Subsection 5.5.1
Asset Valuation Framework



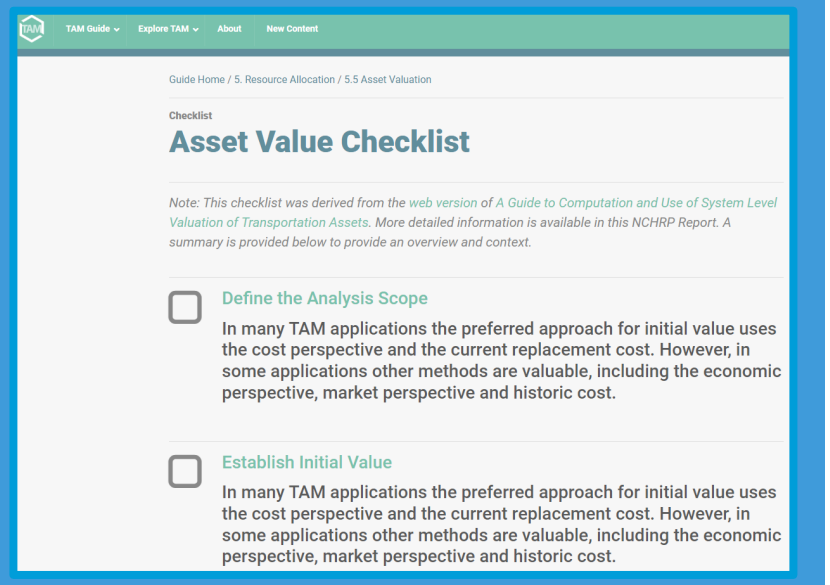


This Section is derived from NCHRP Web-Only Document 335

- **Outlines three perspectives on value**
  - Cost Perspective
  - Market Perspective
  - Economic Perspective

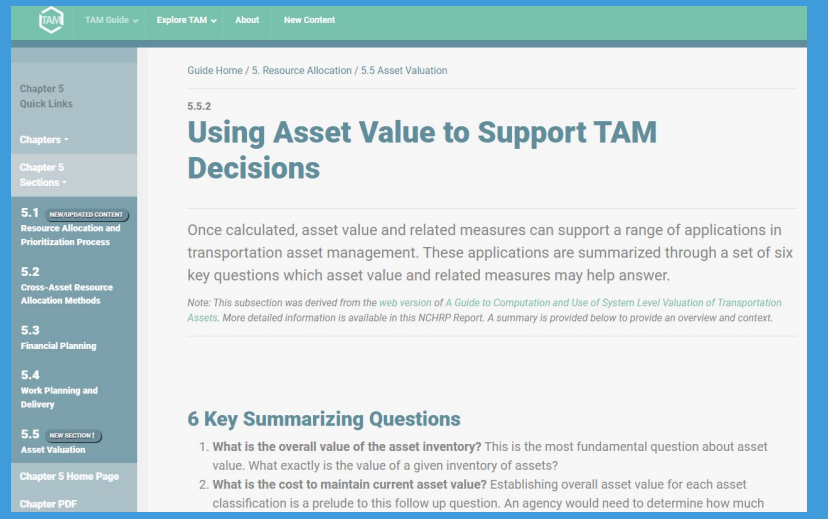
- **Discusses the motivation for using asset valuation in TAM**
  - Communication
  - Fiscal responsibility
  - Testing investment strategies
  - Prioritizing investments

Asset Valuation Checklist



- Define the analysis scope
- Establish initial value
- Determine treatment effects
- Calculate depreciation
- Calculate value and supporting measures
- Communicate and apply the results

Subsection 5.5.2
Using Asset Value to Support TAM Decisions

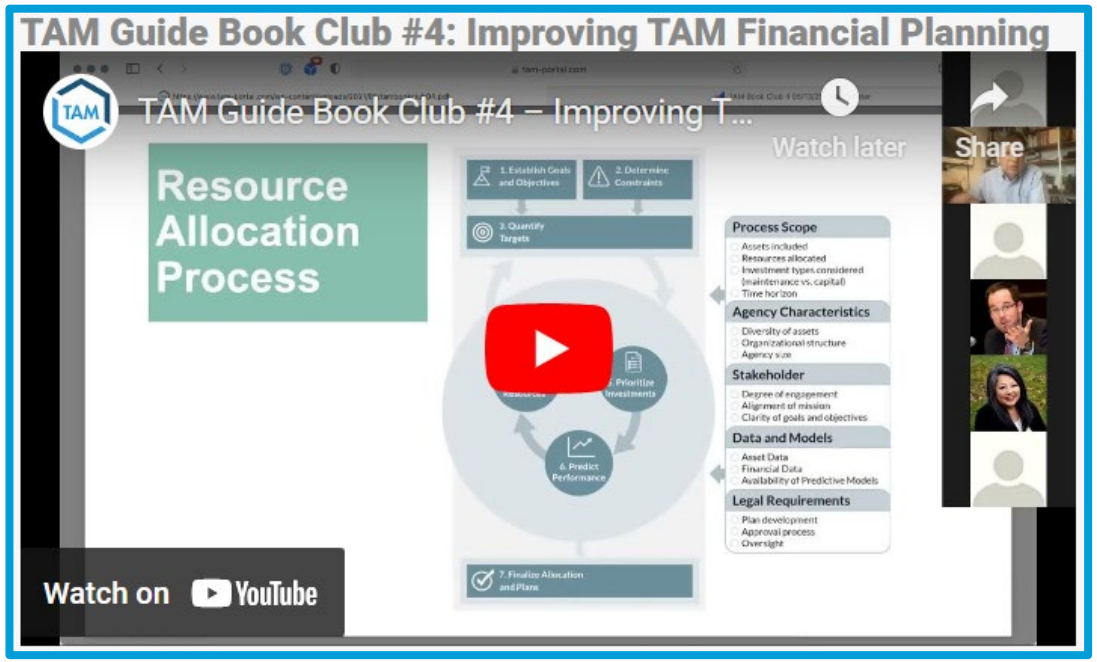


Key questions asset valuation can help address

1. What is the overall value of the asset inventory?
2. What is the cost to maintain current asset value?
3. How much should an agency invest in existing assets?
4. How should funds be allocated between different assets or networks?
5. What's the best life cycle strategy for our assets?
6. What is the value generated by the asset?

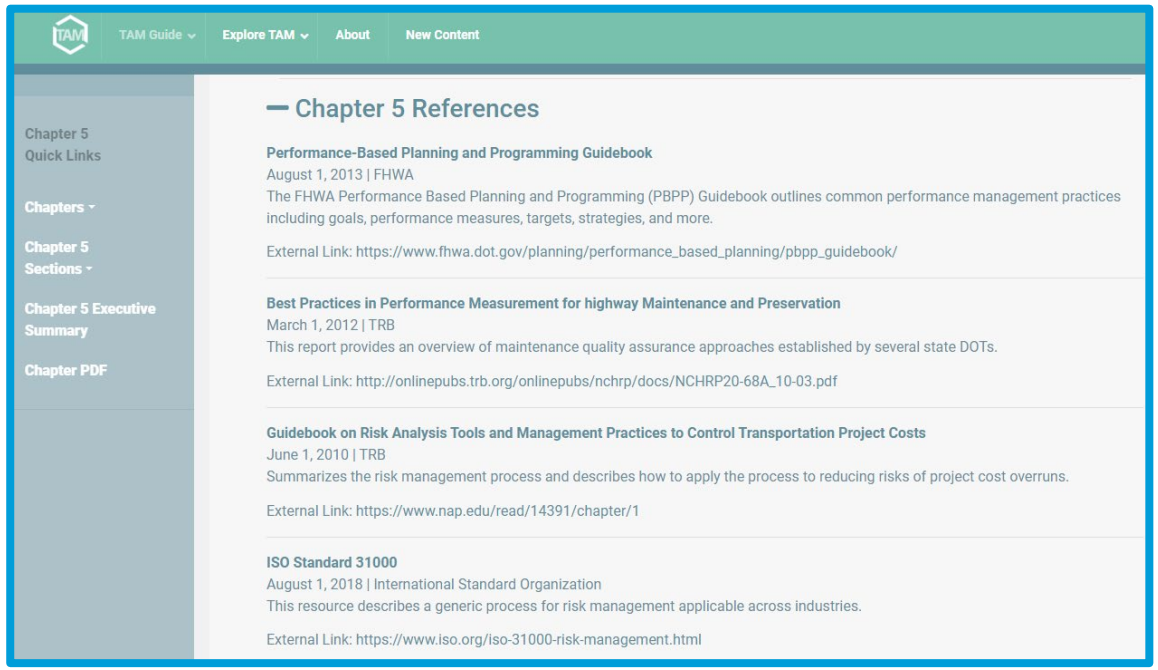
Other Updates

Integration of Videos



- 4 videos added

References



- 15 references added

Thank You

William Robert
Spy Pond Partners, LLC
wrobert@spypondpartners.com

UDOT Asset Valuation Process

AASHTO/TRB TAM Webinar 10-16-24

where we were

valuation challenges

the process

valuation insights

what

exists

is needed

is available

can we do now

can we do in the future

where we are

valuation established

UDOT Asset Valuation Instructions

UDOT Asset Management

Updated 8/26/24

These calculations serve as the basis for the UDOT asset valuation **required annually by FHWA** for the UDOT Transportation Asset Management Plan (TAMP).

For consistency across asset classes, **the methodology for calculating the replacement will be defined or referenced on the individual tab for the asset.**

For applications of asset value, see the AASHTO Asset Value Guide, Chpt. 8.

The asset value is used to demonstrate fiscal responsibility. As assets deteriorate or depreciate, investments should be made to maintain their value.

Each asset tab will have additional valuation calculation exclusions and inclusions defined on the individual tab. Unit cost calculations **for all assets, exclude** the following:

Design	Detour Costs
Mobilization	Field Office
Demolition / removal of existing	Construction Engineering
Earthwork	Training
Site prep	Right-of-Way
Clearing and Grubbing	Utility Relocation
Maintenance of Traffic	Contingencies

The following assets **include depreciation** calculations, and current value:

Asset	Management Approach	Tier
Pavement (NHS and Non-NHS)	Performance Driven +	1
Bridge (NHS and Non-NHS)	Performance Driven +	1
ITS Devices	See Assets List for Mgmt	1
Signals	Performance Driven	1
Pavement Marking Message	Interval Driven +	1
Durable Pavement Marking	Performance Driven	1
Waterborne Pavement Marking	Interval Driven	1

where we are

valuation established

Pavement Asset Valuation

UDOT Pavement Group

Updated 11/15/23

Parameters	Value
Useful Life & Residual Value	
End of useful life (OCI)	50
Residual (salvage) value (%)	50%
Unit Costs ($/SY)	
Weighted avg replacement cost	$161.98
NI1-High Volume	$150.00
NI2-Low Volume	$128.00
INT-Interstate	$202.00
Conversion	
1 area unit to square yards	7040

See "Instructions" tab for general valuation exclusions

Valuation Exclusions	Inclusions
Trail and local, non-NHS pavement	NHS and Non-NHS Pavements
Unpaved shoulders	Paved shoulders
Approach slabs	Pavement section (PCCP, HMA, UTBC, GB)
Paved medians and turnarounds	Ramps
	Pavement to curb returns on side streets

Assumptions

– Includes all State routes, except for institutional roads and gravel roads

– Linear depreciation until end of useful life

– Depreciation based on OCI

Asset Value (using unit costs by road volume)

System	Volume	Area (sq yd)	% Remaining Value	Current Value	Replacement Value
1-NHS	All	112,223,760	88.9%	$17,418,085,275	$19,543,725,893
	High Volume	*57,786,439*	*87.5%*	*$7,582,459,286*	*$8,667,965,856*
	Low Volume	*1,629,443*	*85.1%*	*$177,565,853*	*$208,568,730*
	Interstate	*52,807,878*	*90.5%*	*$9,658,060,136*	*$10,667,191,308*
0-Non NHS	All	58,504,343	85.8%	$6,960,840,137	$8,111,431,075
	High Volume	*28,312,508*	*85.9%*	*$3,649,855,275*	*$4,246,876,128*
	Low Volume	*30,191,836*	*85.7%*	*$3,310,984,863*	*$3,864,554,947*
All	All	170,728,103	87.8%	$24,378,925,413	$27,655,156,968
	High Volume	*86,098,947*	*87.0%*	*$11,232,314,561*	*$12,914,841,984*
	Low Volume	*31,821,279*	*85.6%*	*$3,488,550,716*	*$4,073,123,676*
	Interstate	*52,807,878*	*90.5%*	*$9,658,060,136*	*$10,667,191,308*

Sign Asset Valuation

Central Traffic and Safety

Updated 8/26/24

Source Calculations

Asset Category	Mount Type	Replacement Unit Cost	Inventory (sign faces)	Replacement Value
Overhead Sign	Cantilever Truss	$9,000.00	61	$549,000
Overhead Sign	Cantilever Tube	$10,000.00	970	$9,700,000
Overhead Sign	Double Cantilever	$15,000.00	188	$2,820,000
Overhead Sign	Structure Mounted	$6,000.00	475	$2,850,000
Overhead Sign	Truss Sign Bridge	$9,000.00	32	$288,000
Overhead Sign	Tube Sign Bridge	$10,000.00	1,170	$11,700,000
Overhead Sign	Tube Sign Bridge with Cantilever	$9,000.00	140	$1,260,000
Multi-Post Signs	Double Post	$1,000.00	9,312	$9,312,000
Multi-Post Signs	Five Post	$1,600.00	3	$4,800
Multi-Post Signs	Four Post	$1,400.00	129	$180,600
Multi-Post Signs	Triple Post	$1,200.00	903	$1,083,600
Single-Post Signs	One Post	$400.00	97,995	$39,198,000
Single-Post Signs	Utility Pole	$400.00	3,567	$1,426,800
Other	Gate	$200.00	101	$20,200
Other	Mast Arm	$300.00	6,196	$1,858,800
Other	Signal Pole	$300.00	3,051	$915,300
Other	Span Wire	$250.00	5	$1,250
Other	Other	$400.00	1,048	$419,200
	Overhead Sign		*3,036*	*$29,167,000*
	Multi-Post Signs		*10,347*	*$10,581,000*
	Single-Post Signs		*101,562*	*$40,624,800*
	Other		*10,401*	*$3,214,750*
	Total		**125,346**	**$83,587,550**

UDOT Keeping Utah Moving

where we are headed

valuation application

Table 8-1. Asset Value-Related Measures and Mapping to Key Questions

Key Questions	Asset Value	Cost to Maintain Current Value	Asset Sustainability Ratio (ASR)	Asset Consumption Ratio (ACR)	Asset Funding Ratio (AFR)	Net Present Value (NPV)
Q1: Overall Inventory Value	X			X		
Q2: Cost to Maintain		X	X	X		
Q3: Needed Spending					X	X
Q4: Allocating Funds		X	X	X	X	X
Q5: Life Cycle Strategy						X
Q6: Value Generated						X

Source: AASHTO Asset Valuation Guide, Ch 8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Keeping Utah Moving

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Topic: Asset Performance, Monitoring & Adjustment

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