Transportation Asset Management Webinar Series

Webinar 66

Beyond Pavements and Bridges
(how agencies are integrating other assets)

Sponsored by FHWA and AASHTO

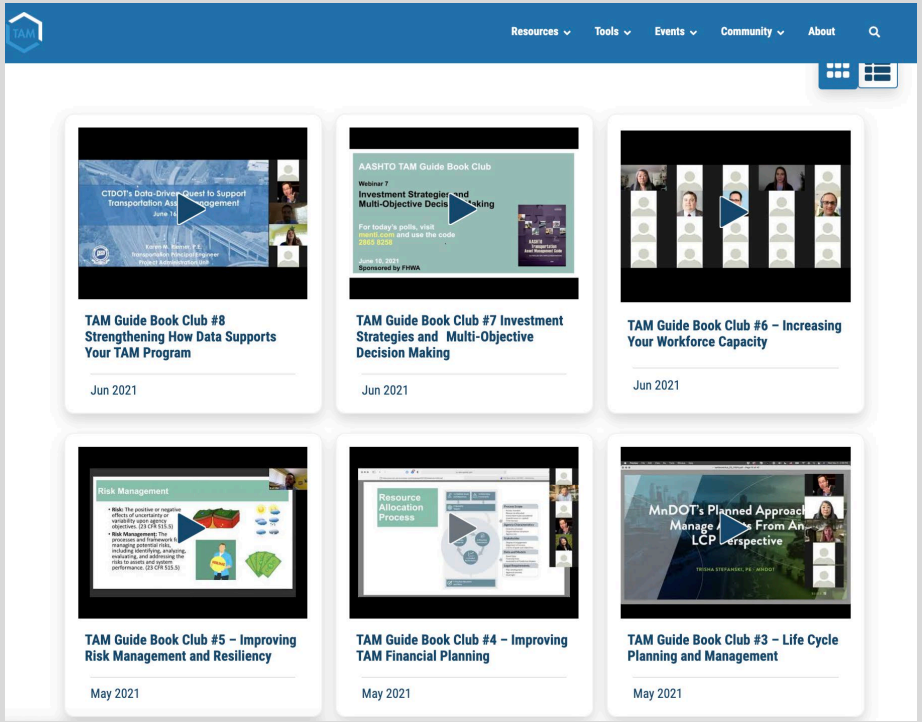
U.S. Department of Transportation
Federal Highway Administration

AASHTO
The Voice of Transportation

December 20, 2023

FHWA/AASHTO Asset Management Webinar Series

- This is the 66th 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
  - 3rd Wednesdays, 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

Webinar Objectives

- Highlight how state DOTs are adding transportation assets other than pavements and bridges into their TAM programs
- Exchange best practices for including a variety of assets in TAM programs (examples include culverts, lighting, and sign structures)
- Learn how to apply TAM principles and approaches to these various assets

Webinar Agenda

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

2:15 **Presentation 1**
Stephanie Shippee, Connecticut DOT

2:25 **Presentation 2**
Kellie Thom, Minnesota DOT

2:35 **Presentation 3**
Michael Johnson, California DOT

2:45 **Presentation 4**
Ning Li, Virginia DOT

2:55 **Presentation 5**
Toby Manthey and Hope Wright, Colorado DOT

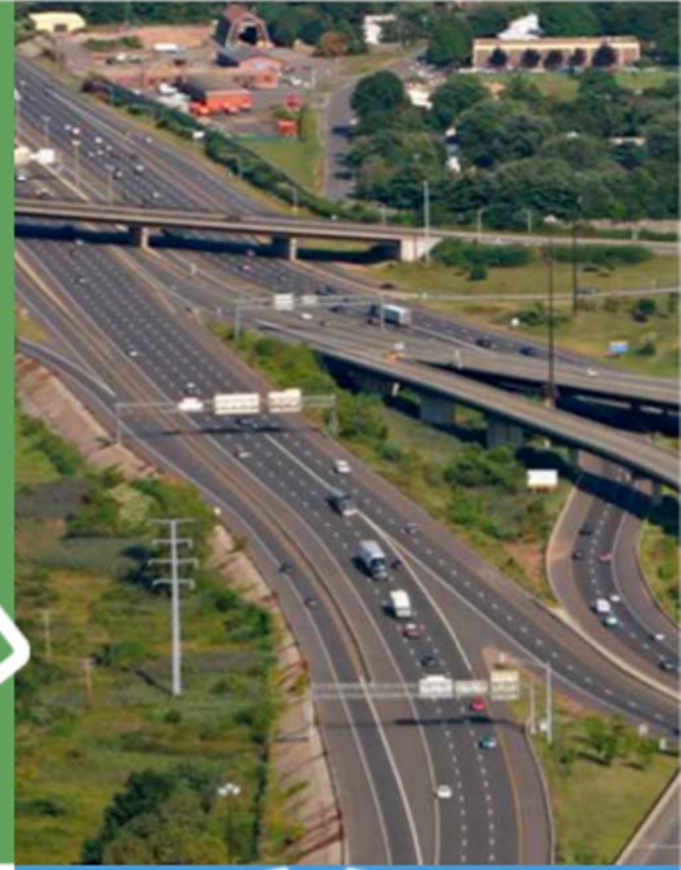
3:10 **Q&A**
Hyun-A Park, Spy Pond Partners

3:20 **Discussion and Wrap-up**
Hyun-A Park, Spy Pond Partners

Connecticut Department of Transportation

Cheaper by the Dozen:

Adding Assets to the CTDOT TAM Program



December 20, 2023

Stephanie Shippee, P.E.
Transportation Supervising Engineer
CTDOT TAM Group

11 Assets and Counting…

Current Highway Asset Network

Additional Assets in CTDOT's Highway TAMP

Timeline

2018

- Bridge
- Pavement
- Traffic Signals
- Signs
- Sign Supports
- Pavement Markings

2019

- Bridge
- Pavement
- Traffic Signals
- Signs
- Sign Supports
- Pavement Markings
- Highway Buildings

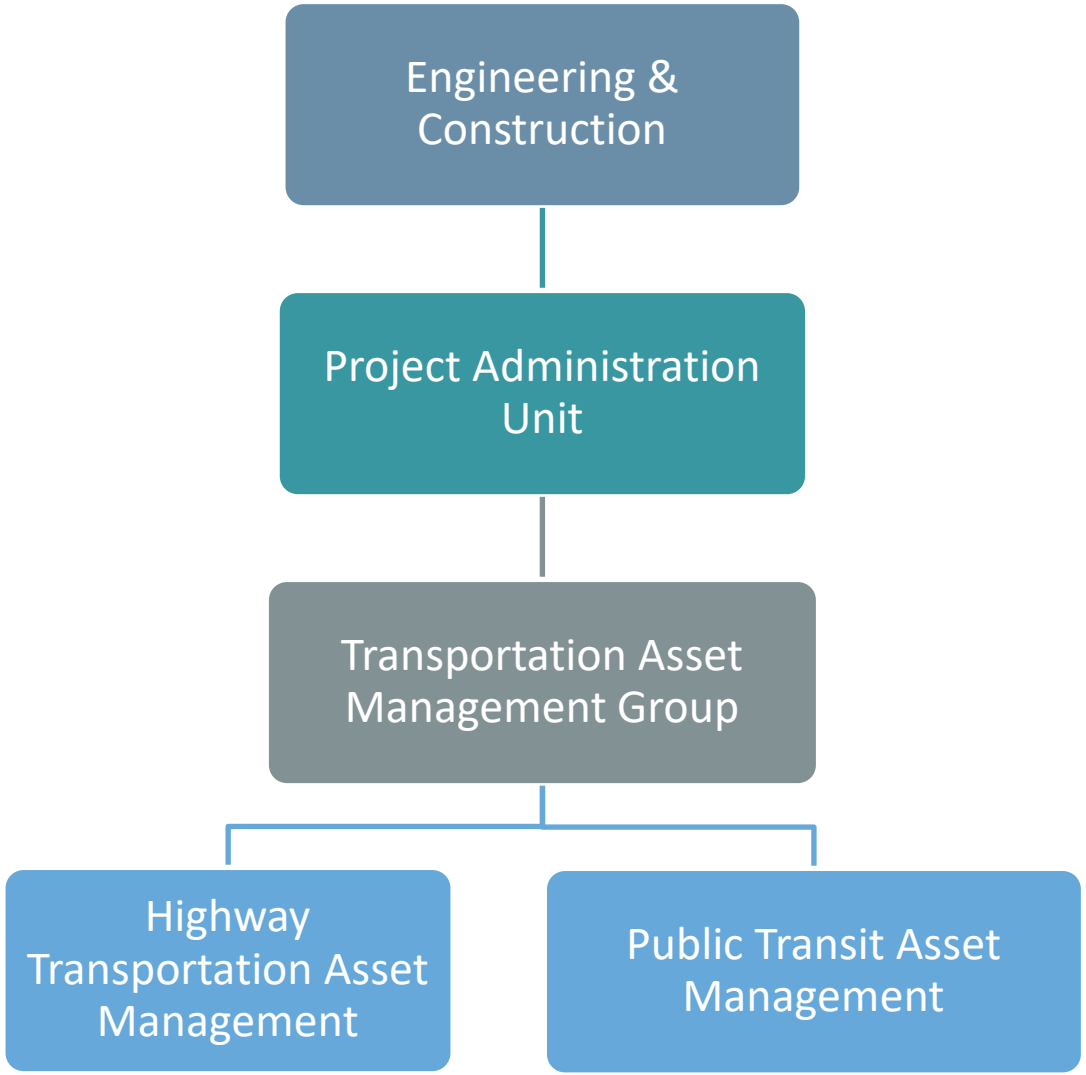
2022

- Bridge
- Pavement
- Traffic Signals
- Signs
- Sign Supports
- Pavement Markings
- Highway Buildings
- Illumination
- Drainage Culverts
- Retaining Walls
- ITS: ATMS

2024

- Bridge
- Pavement
- Traffic Signals
- Signs
- Sign Supports
- Pavement Markings
- Highway Buildings
- Illumination
- Drainage Culverts
- Retaining Walls
- ITS: ATMS
- ADA Curb Ramps
- Fleet
- Noise Walls
- Guiderail

Current Asset Management Structure



Asset Working Group

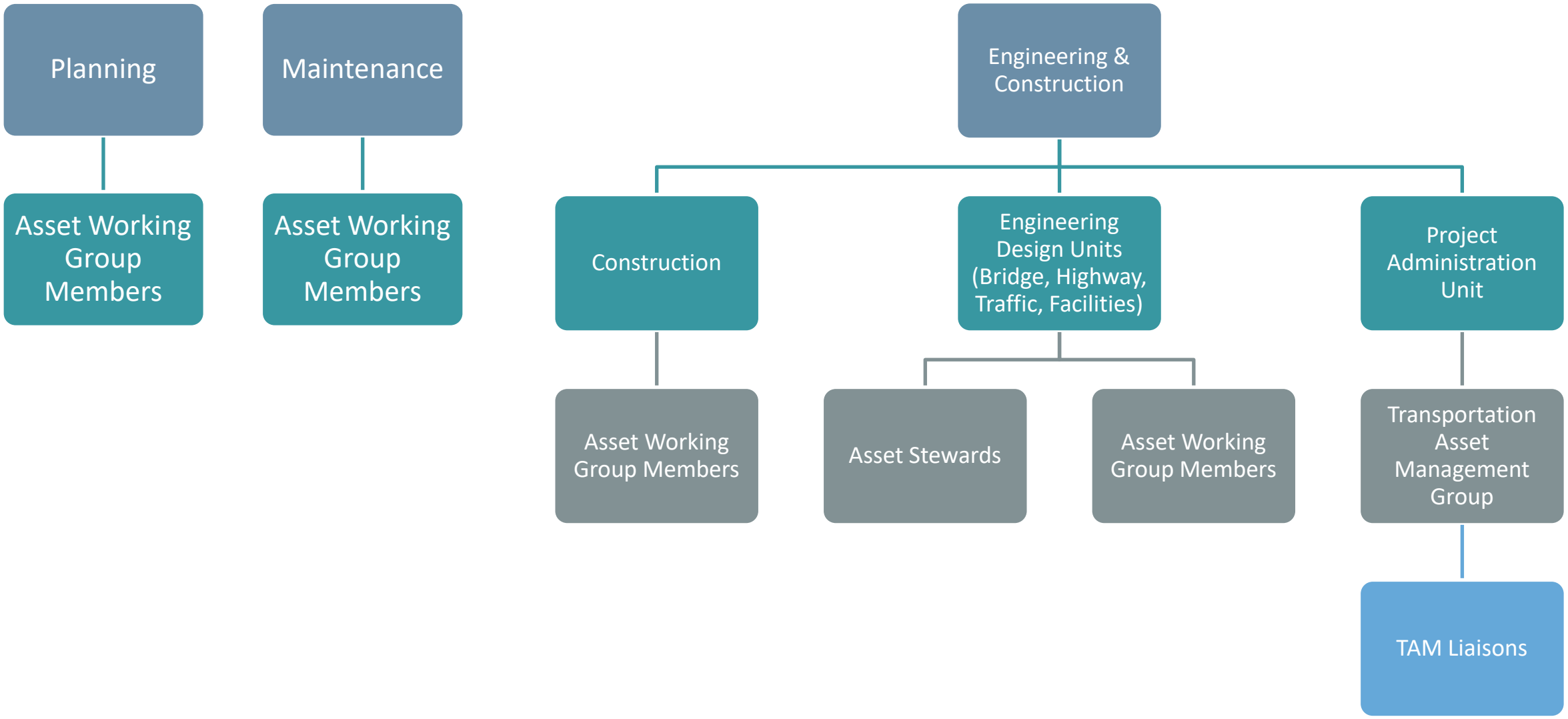
TAM Liaison — One of three engineers on the HW TAM team, drives TAM deliverables and ensures consistency between assets

Asset Steward — Supervising Engineer who selects SOGR projects for the asset

Asset Working Group — Other stakeholders across the department who work closely with asset and its data

CTDOT Assets

Who is Involved?



Asset Deliverables

Annually

- Fact Sheet
- Consistency Performance
- Consistency Financial
- State of the Asset presentations to Chief Engineers

Quadrennially

- TAMP Narrative
- TAMP Projections

Data Collection/Fact Sheets

NHS-NBI Bridge Inventory and Condition

What is the primary year of data collected?	2021
CTDOT NBI Submittal Date?	3/15/2022

		Count (bridges)				Deck Area (sq ft)	
Responsibility	System	Good	Fair	Poor	Total	Good	F
CTDOT-Maintained & Maintained by Others	NHS-NBI	371	1,399	53	1,823	3,749,993	20,881,0
CTDOT-Maintained & Maintained by Others	NHS Non-NBI, Non-NHS NBI, and Non-NHS Non-NBI				3,617		
Maintained by Others	NHS-NBI				14		

CTDOT-Maintained Bridge Inventory and Condition

What is the primary year of data collected?	2021
CTDOT Data Snapshot date?	3/15/2022

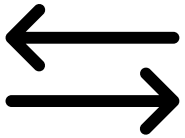
	Count (bridges)

Inventory and Condition | Scenario Projections | Asset Valuation | Expenditures by Work Type | Consistency Review-Financial | C ...

Lessons Learned

Challenges

Larger volume of work



Remaining consistent between assets

Evolving Assets

Challenges: Large Volume of Work

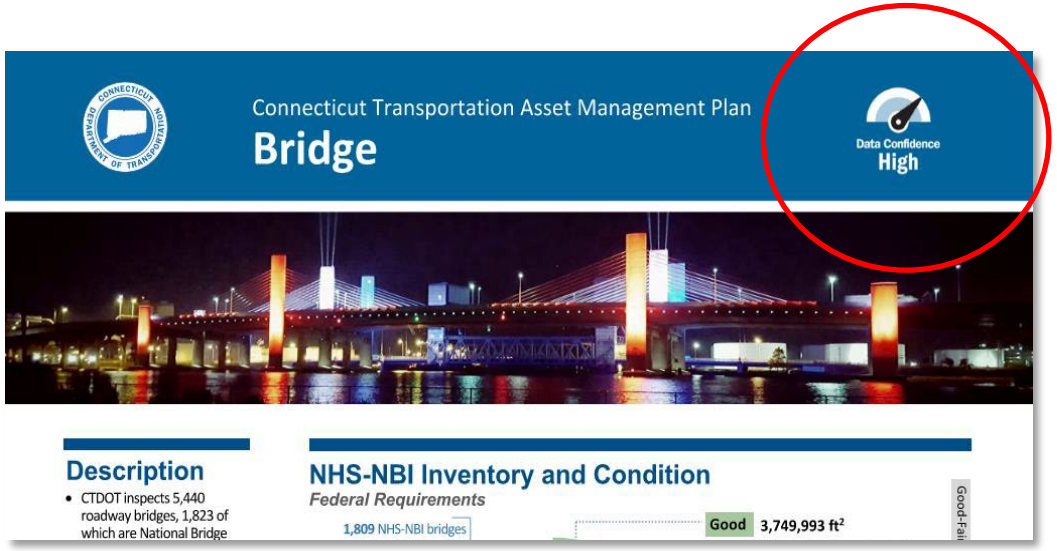
- More data for TAM team to report to FHWA
- 11 asset stewards to coordinate with
- 11 different risk evaluations
- 11 fact sheets to produce annually
- 11 more opportunities for performance gaps

2023 FHWA Annual Consistency Review
CTDOT Implementation Documentation
Projected and Actual Asset Performance Measures

2023	Inventory (2023 Fact Sheet)	Measure	2022 Fact Sheet Condition	2023 Fact Sheet Condition	Difference Between 2022 FS and 2023 FS	2022 TAMP Year 1 Projected	Difference Between Current and Projected	Comment
CTDOT Maintained								
Bridges	4,054 Bridges	SOGR	96.2%	96.4%	0.2%	97.5%	-1.1%	80 culverts were discovered (including many in poor condition) projections.
Pavement	3,715 Centerline Miles	SOGR	69.4%	70.8%	1.4%	73.5%	-2.7%	The LCMS that measures pavement cracking was upgraded, res detected in 2021, which pushed the cracking metric and overall
Traffic Signals	2,786 Assets	SOGR	61.8%	58.3%	-3.5%	64.1%	-5.8%	Majority of signals were installed in the 90s, so they are hitting transitioning to condition based signal inventory. Preliminary s rating is more pessimistic than the actual condition.
Signs	807,627 SF Extruded Aluminum	SOGR	42.4%	51.5%	9.1%	51.5%	0.0%	
	1,045,448 SF Sheet Aluminum	SOGR	41.1%	51.2%	10.1%	42.9%	8.3%	Improved data created a reduction in total number of sheet alu percentages.
Sign Supports	1,651 Overheads Sign Supports	SOGR	98.5%	98.5%	0.0%	93.1%	5.4%	
Pavement Markings	97,000,000 Linear FT Lines	SOGR	83.8%	58.5%	-25.3%	73.7%	-15.2%	2021-2022 contractors were unable to aquire epoxy due to sho fall of 2022.
	3,400,000 SF Symbols	SOGR	48.2%	34.4%	-13.8%	39.0%	-4.6%	2021-2022 contractors were unable to aquire epoxy due to sho fall of 2022.
Highway Buildings	103 Tier 1 Buildings	SOGR	87.4%	89.3%	1.9%	87.4%	1.9%	Unprogrammmed SOGR upgrades and emergency repairs caus
	93 Tier 2 Buildings	SOGR	100.0%	100.0%	0.0%	100.0%	0.0%	
	149 Tier 3 Buildings	SOGR	61.0%	62.4%	1.4%	60.6%	1.8%	Additional unplanned Tier 3 structures purchased by Maintena projection.
Illumination	23,870 Lights Fixtures	SOGR	84.9%	85.7%	0.8%	86.5%	-0.8%	Construction spending for projects 0173-0504 & 0173-0511 was
Retaining Walls	1,497 Retainings Walls	SOGR	97.9%	96.7%	-1.2%	97.8%	-1.1%	Inventory is still incomplete, targeted evaluations of wall types increased the number of known poor walls.
Drainage Culverts	11,500 Estimated Culverts	SOGR	86.3%	86.5%	0.2%	83.1%	3.4%	Drainage culvert inventory is now approximately 20% complet
ITS: ATMS	548 ATMS Field Devices	SOGR	48.6%	46.7%	-1.9%	38.0%	8.7%	Many quick VMS projects were completed that were not accou replacement VMS within signage projects has been streamline

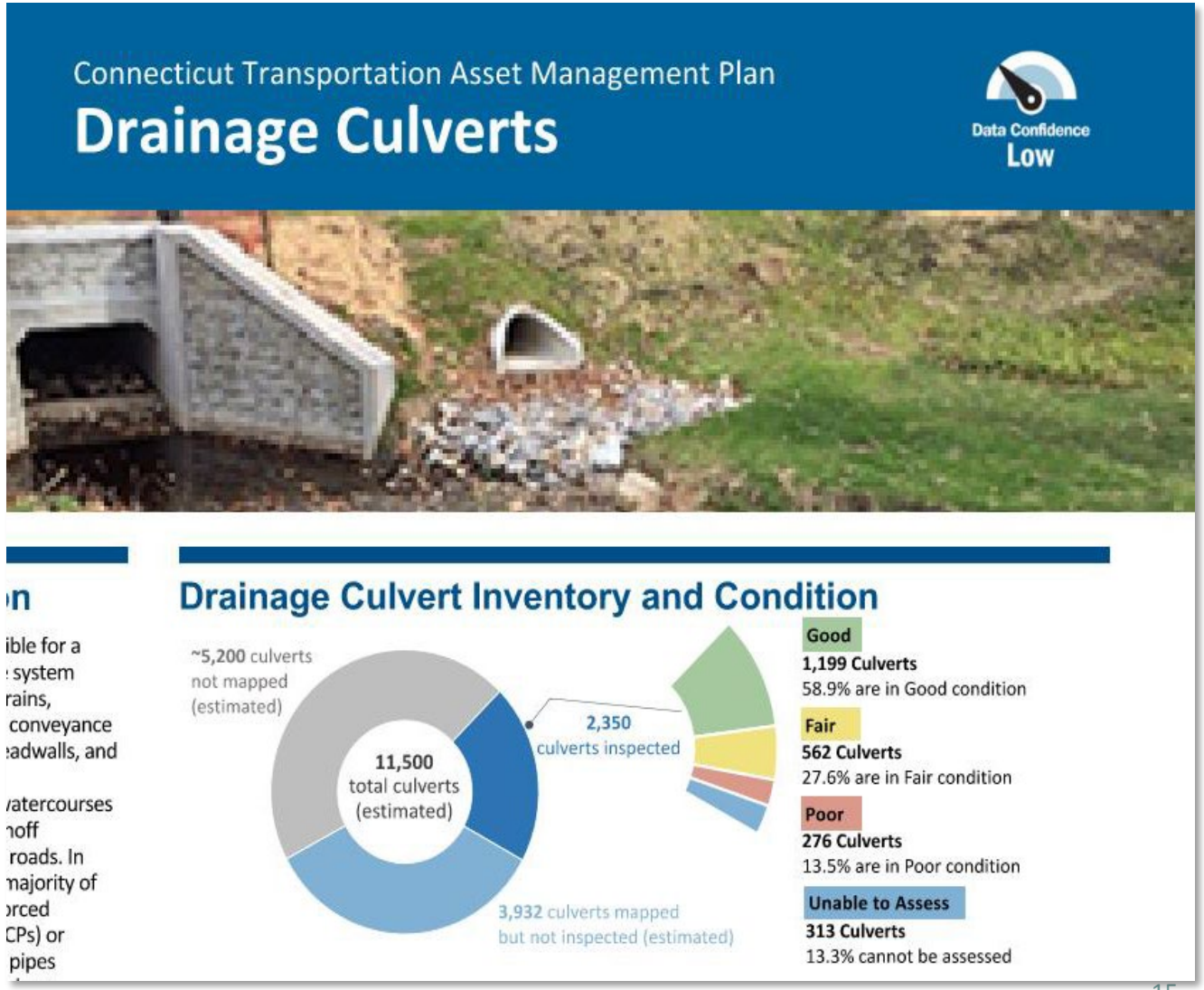
Challenges: Consistency Between Assets

- Bridge data very different from Pavement Markings
- Reporting different assets in similar manner



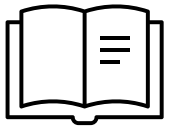
Challenges: Evolving Assets

- Incomplete data sets
- Immature SOGR
- Projections



Benefits

Knowledge of TAM principles throughout CTDOT 



Codify TAM Practices

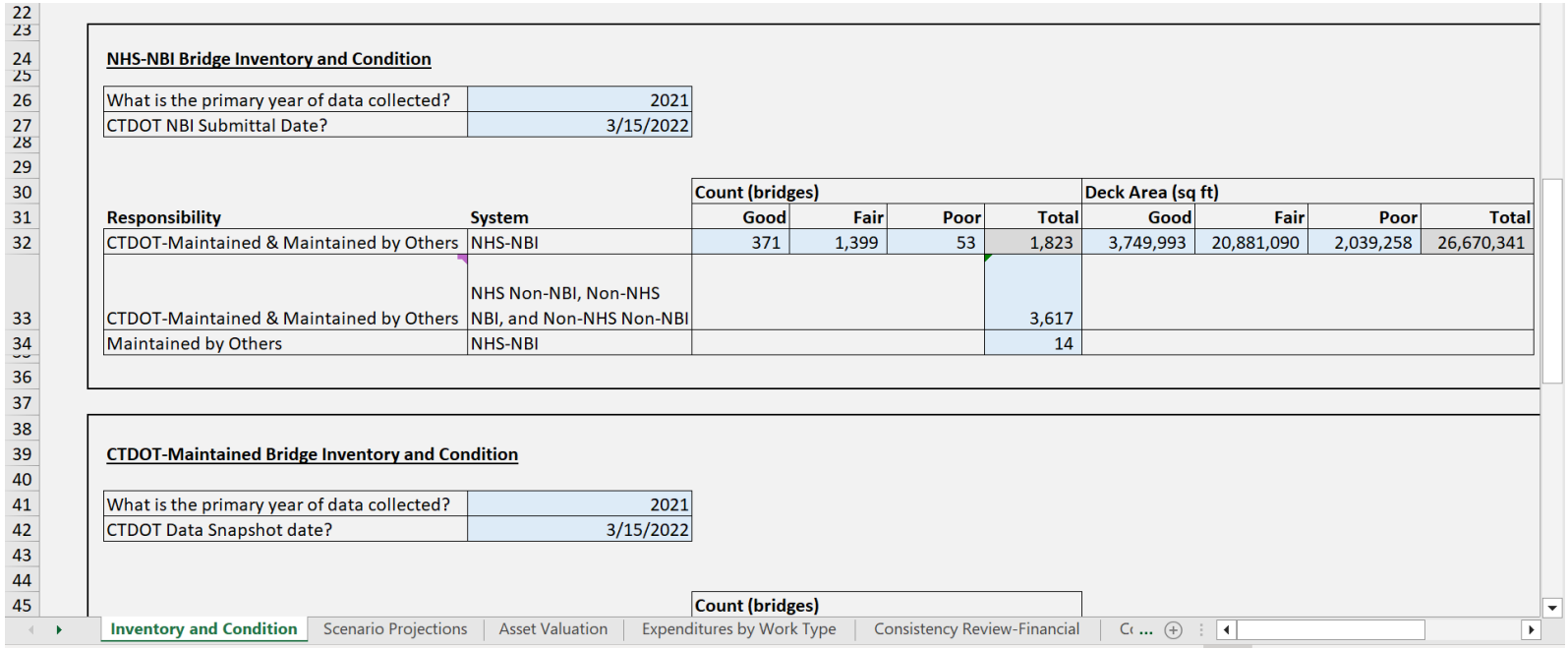
Ability to evolve as asset data improves 

Illuminate Evolving Asset Needs

Potential for future network-based approach 

Benefits: Knowledge of TAM Principals throughout CTDOT

- 11 asset stewards at supervising engineer level
- 11 asset working groups



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	Count (bridges)

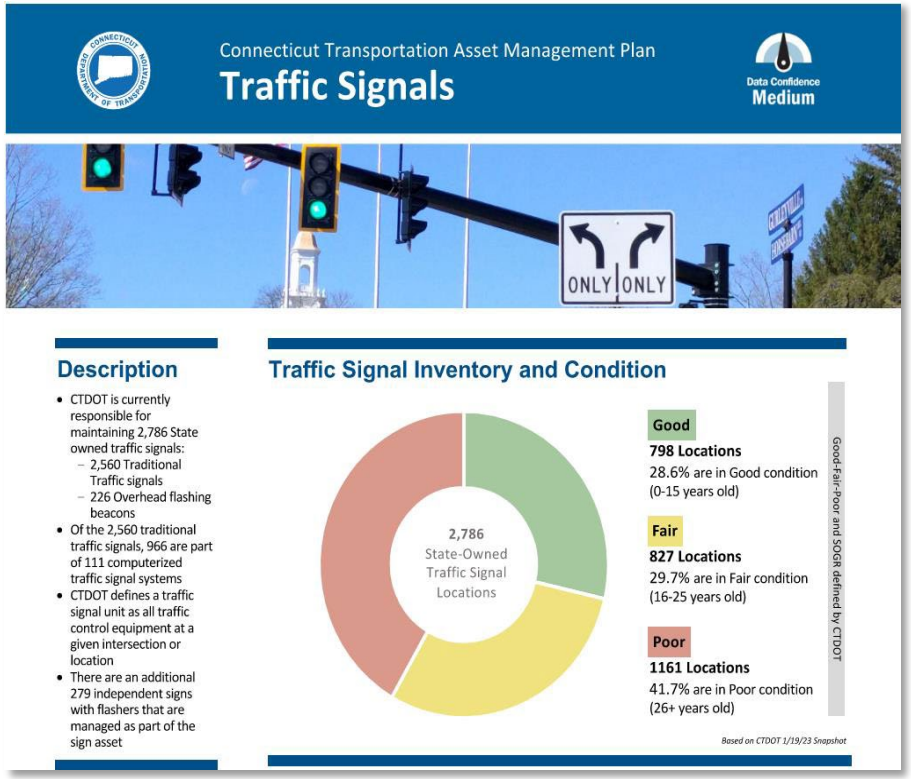
Inventory and Condition | Scenario Projections | Asset Valuation | Expenditures by Work Type | Consistency Review-Financial

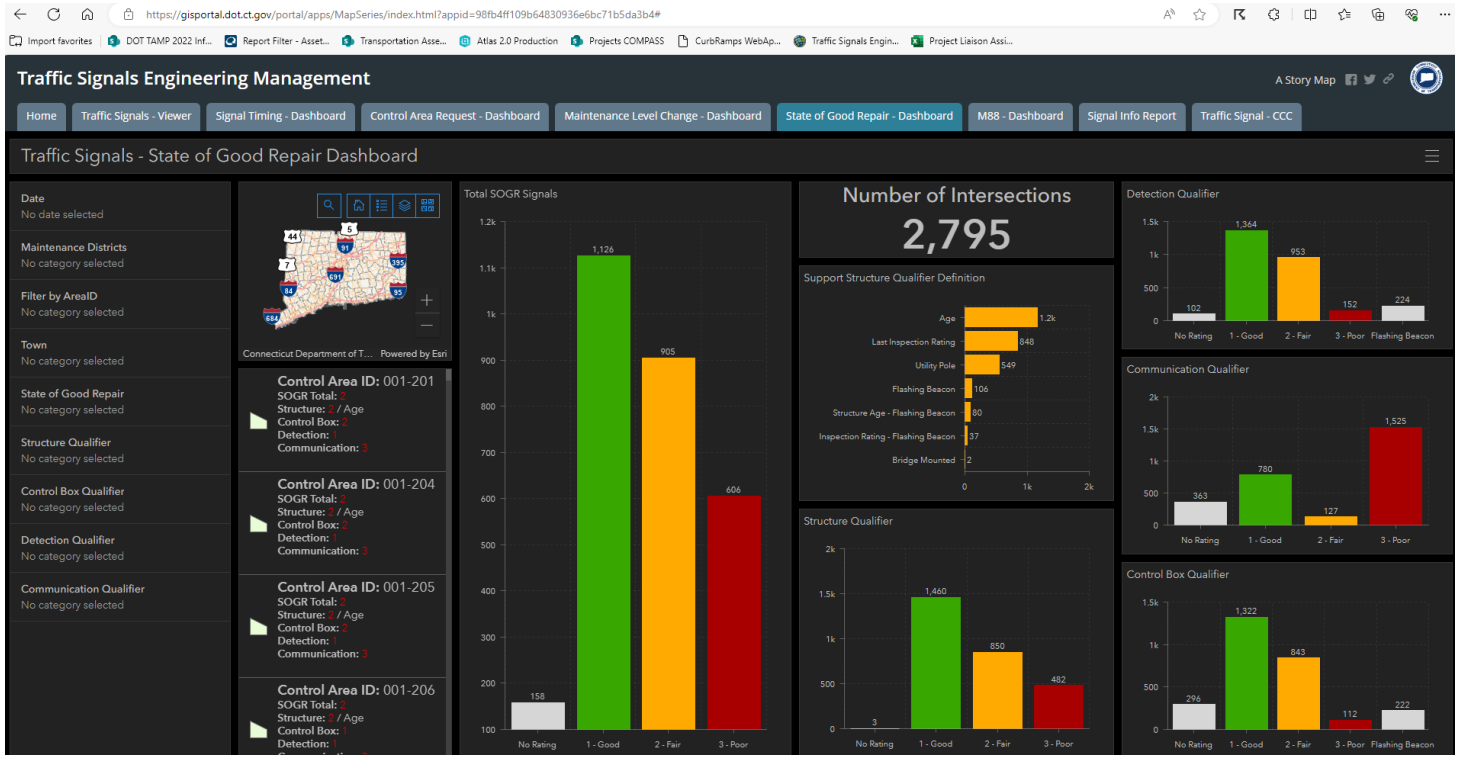
Benefits: Codify TAM Practices

- Supportive leadership
- Spreading TAM awareness through CTDOT culture
- Supportive FHWA division

Benefits: Ability to Evolve as Asset Data Improves

- Traffic Signal SOGR was age based
- 2024 will be component based





Benefits: Illuminate Evolving Asset Needs

Connecticut Transportation Asset Management Plan

Drainage Culverts

Data Confidence
Low

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roads. In
majority of
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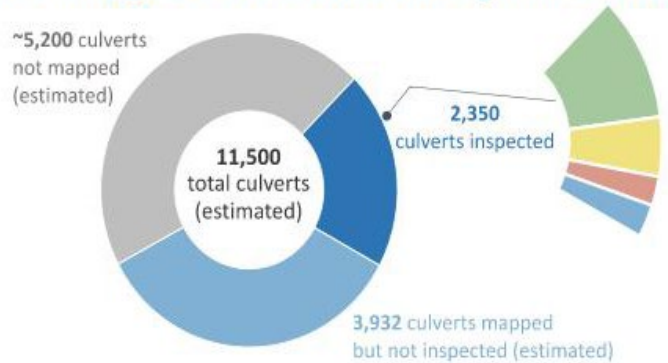
CPs) or
pipes

Drainage Culvert Inventory and Condition



Good
1,199 Culverts
58.9% are in Good condition

Fair
562 Culverts
27.6% are in Fair condition

Poor
276 Culverts
13.5% are in Poor condition

Unable to Assess
313 Culverts
13.3% cannot be assessed

Benefits: Potential for Future Network-Based Approach

Summary

- Adding assets to the network has been a net positive experience
- Adding evolving assets to TAM program can increase visibility and drive improvement
- Brief communication materials are essential for summarizing information

Fact Sheet Link: https://enhanced-ctdot-factsheet.herokuapp.com

Questions?

stephanie.shippee@ct.gov

Fact Sheet Link: https://enhanced-ctdot-factsheet.herokuapp.com

TAMS HydInfra (Hydraulic Infrastructure) Overview

8/15/2023

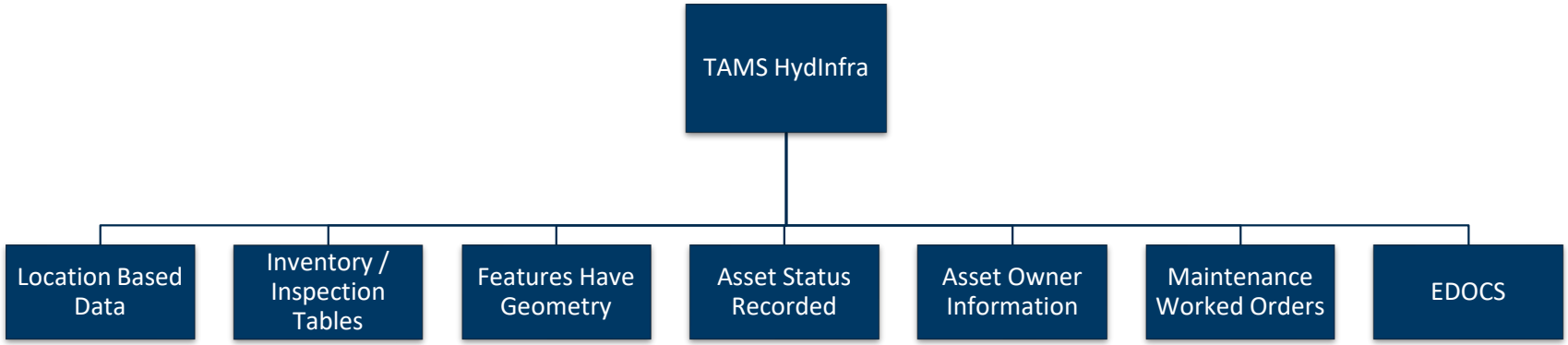
DEPARTMENT OF TRANSPORTATION

mndot.gov

Background

- 1994 District Hydraulic Engineer Group lobby for funding of Hydraulic Automation Unit in the Bridge Office (2FTE filled in 1995).
- 1995-1997 – HydInfra (inventory and inspection) created to improve drainage design and maintenance.
- Mid 2000's – Metro District MS4 Permit Requirements
- Mid 2000's – Gopher State One Call Requirements
- 2006 – Tracking Metro Maintenance Repairs
- 2008 – 2 Centerline Culvert Performance Measures (Inventory, Condition)
- 2017 – TAMS HydInfra

TAMS HydInfra



Data Captured

Asset Types – 235113 In Place Features in TAMS*

Pipes (142278)

- Storm Sewer
- Culverts (Non- Bridge)
  - Highway
  - Local Road
  - Entrance
  - Other

Hydraulics Structures (77716)

- Catch Basins, Manholes, Drop Inlets, Deck Drains, Control Structures
- Structural Pollution Control Devices
- Special Structural Features

Ponds (1511)

- Ponds (Wet, Dry, Unknown)
- Basins (Filtration, Infiltration)
- Wetlands (Natural/ Mitigation)

Deep Stormwater Tunnels (8)

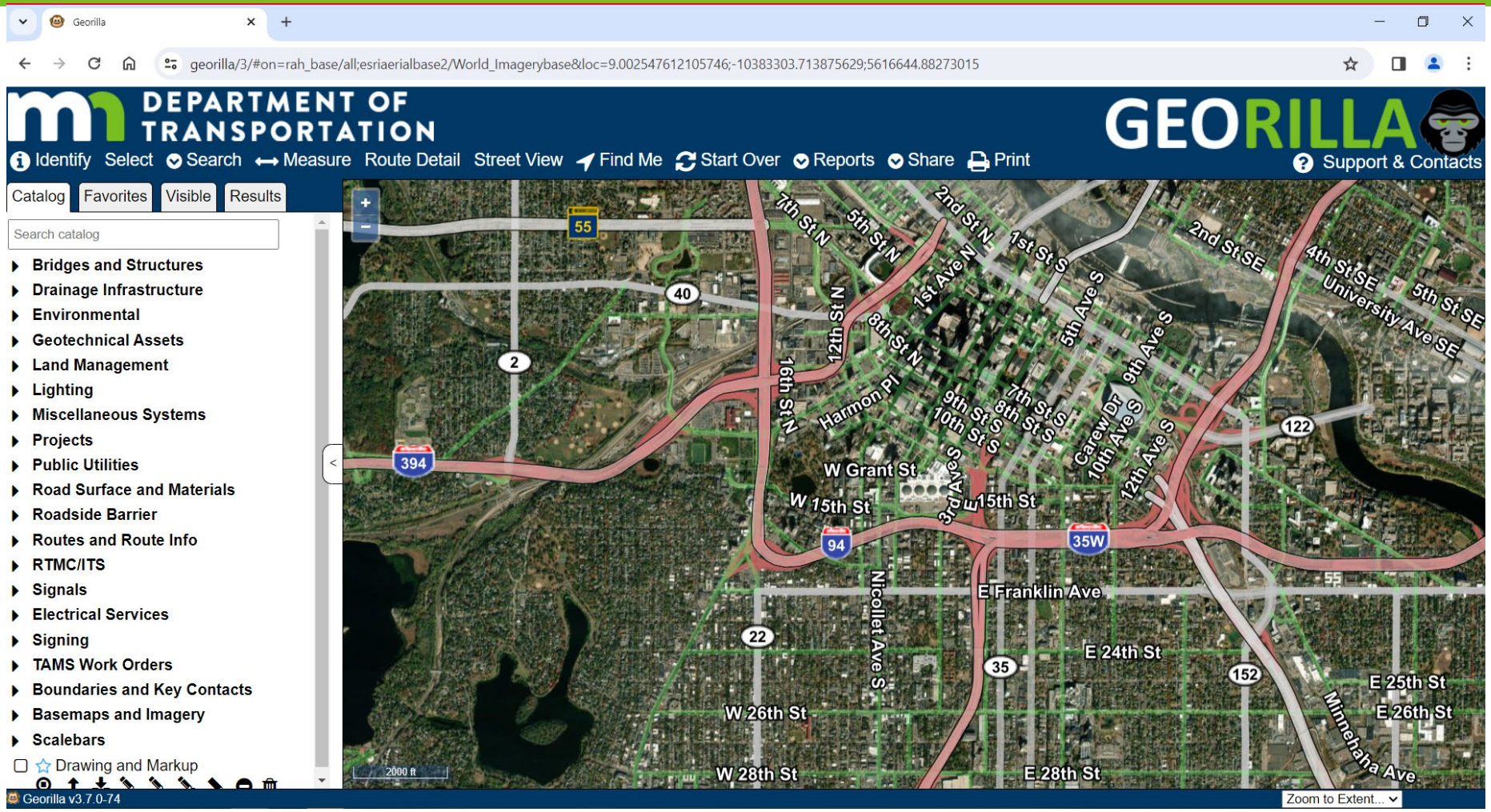
- Metro District Only

* As of 1/3/2023

Data Usage

MnDOT Statewide	District Hydraulic Design	District Maintenance
• Capital Planning • Performance Measures • TAMP • Gopher State One Call • Design Standards • Design Guidance • MS4 Permit • Research	• Project Selection • Scoping • Design Plan Aid • Drainage Permit Reviews • Data Requests	• Drainage System Maintenance Planning • Spill Response • Flood Response

Data Access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DEPARTMENT OF TRANSPORTATION
GEORILLA
Identify
Select
Search
Measure
Route Detail
Street View
Find Me
Start Over
Reports
Share
Print
Support & Contacts
Catalog
Favorites
Visible
Results
Search catalog
Bridges and Structures
Drainage Infrastructure
Environmental
Geotechnical Assets
Land Management
Lighting
Miscellaneous Systems
Projects
Public Utilities
Road Surface and Materials
Roadside Barrier
Routes and Route Info
RTMC/ITS
Signals
Electrical Services
Signing
TAMS Work Orders
Boundaries and Key Contacts
Basemaps and Imagery
Scalebars
Drawing and Markup
7th St N
5th St N
2nd St N
1st St S
2nd St SE
4th St SE
University Ave SE
5th St SE
1st Ave N
5th Ave S
9th Ave S
12th St N
8th St N
16th St N
Harmon Pl
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E 28th St
55
40
2
394
94
35W
22
35
152
122
2000 ft
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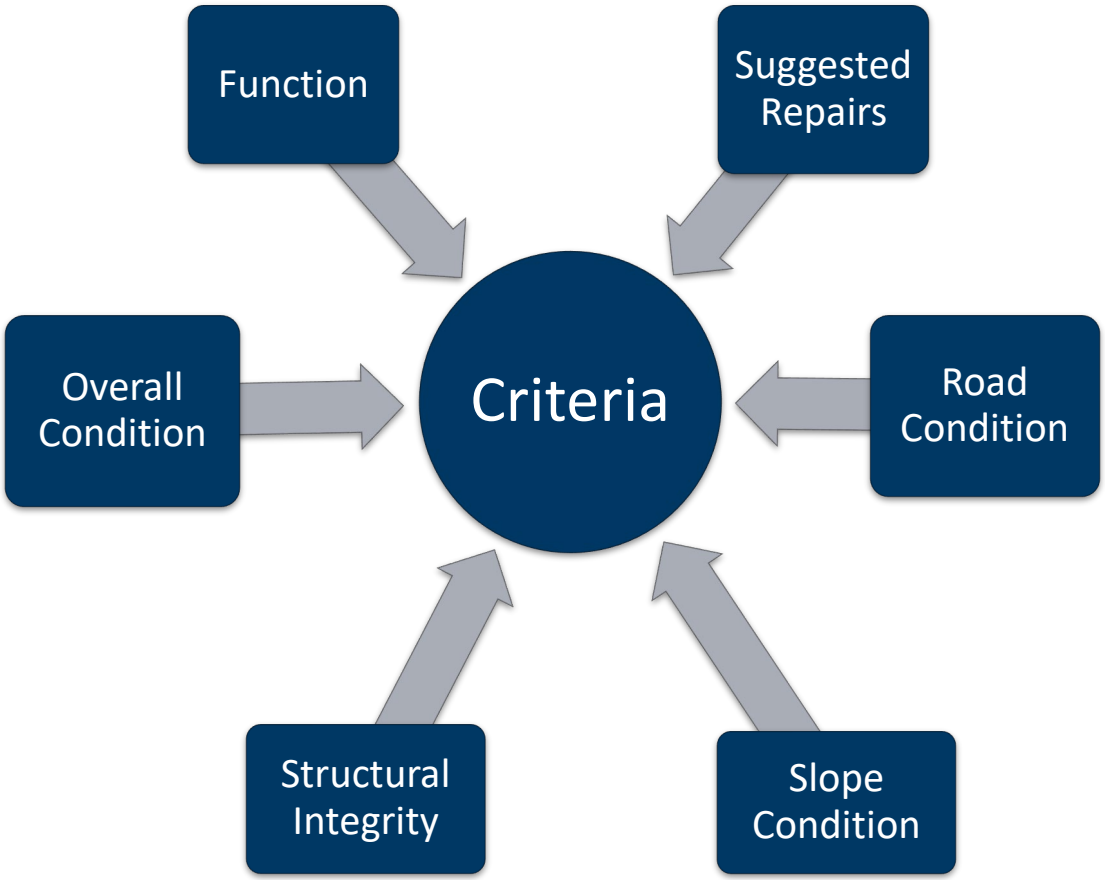
Zoom to Extent...

Data Collection

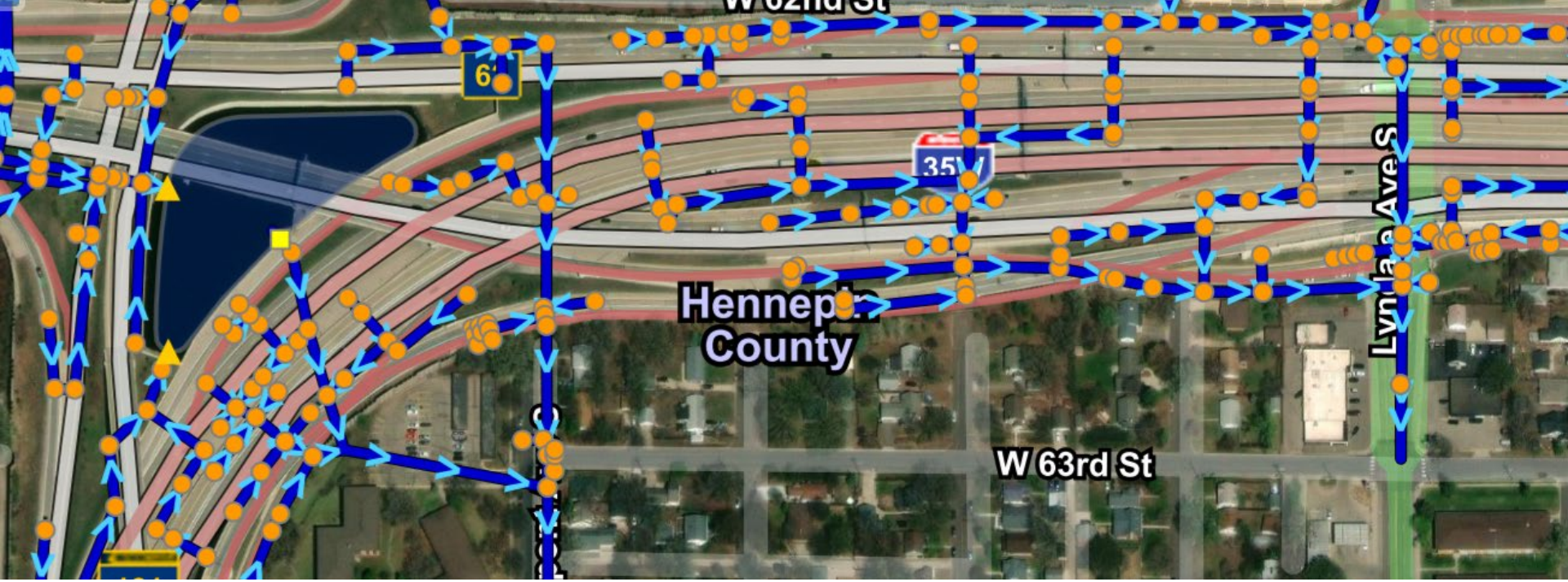
- Data Capture
- Software
- Equipment
- Collectors

Inspection Criteria



Challenges

- Data quality / consistency
- Data completeness
- Collection Applications
- Data Uses



Thank You!

Kellie Thom, TAMS HydInfra Coordinator

kellie.thom@state.mn.us

612-322-0564

DEPARTMENT OF TRANSPORTATION

ASSET MANAGEMENT BEYOND PAVEMENT AND BRIDGES

MICHAEL JOHNSON
STATE ASSET MANAGEMENT ENGINEER
CALIFORNIA DEPARTMENT OF TRANSPORTATION

DEC 2023

Caltrans Asset Management Approach

- Our approach evaluates 30+ objectives in a fiscally constrained performance management framework
- The total available funding is distributed across all objectives
- This approach provides the clearest visibility into the trade-offs an agency is making

Sample of Performance Objectives

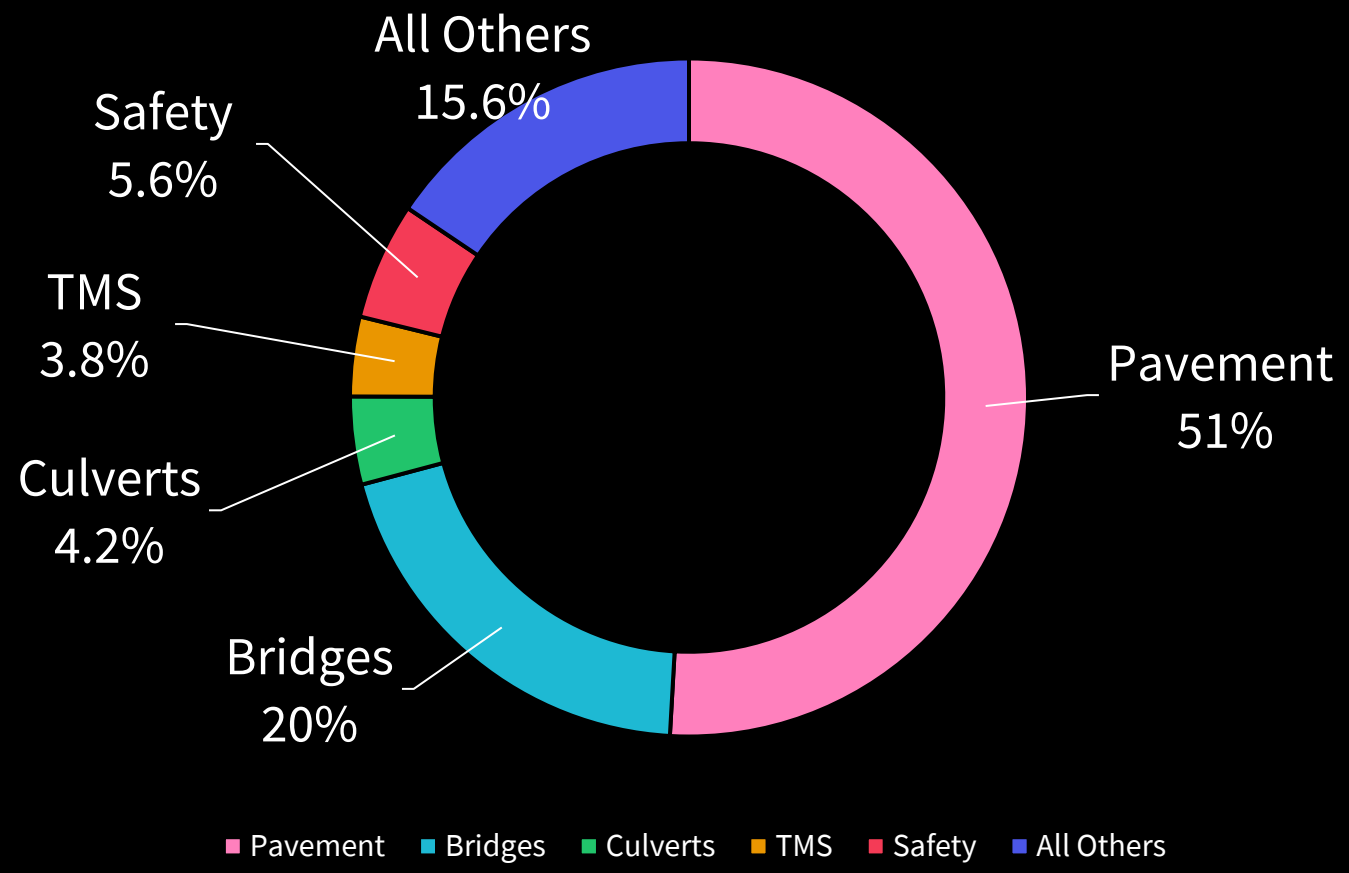
Physical Assets

- Pavement (3 classes)
- Bridges
- Culverts
- Transportation Management Systems
- Bike and Pedestrian Facilities
- Facilities (5 types)
- WIM Scales
- Pumps, overhead signs, roadside rest areas, sign panels, lighting…

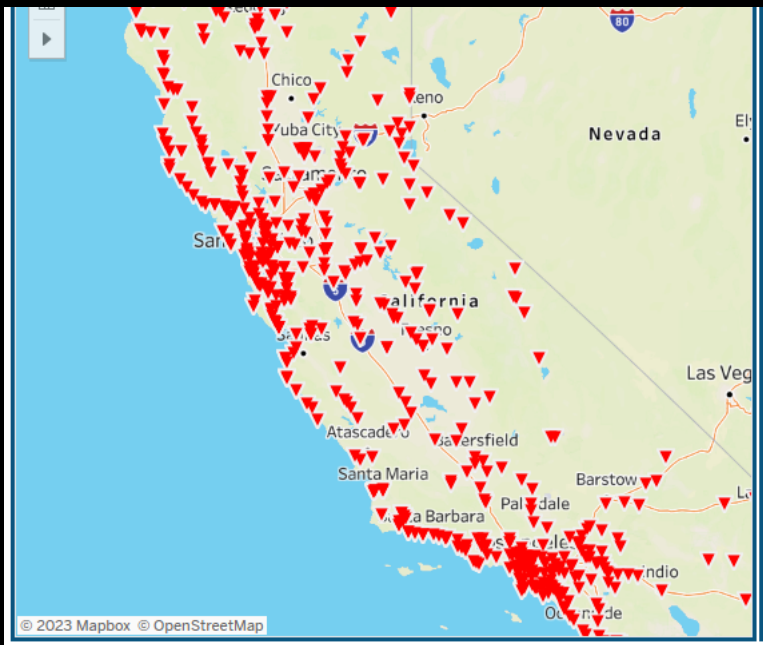
Deficiencies

- Safety
- Operational Improvements
- System Vulnerabilities
- Climate Adaptation Needs
- ADA Needs
- Fish and Wildlife Crossing Needs
- Stormwater Mitigation
- Seismic and Scour
- Protective Betterments

Annual Funding Breakdown



Physical Asset Projects are multi-objective



south of Humboldt Road/Enderts Beach Road. Rehabilitate pavement and upgrade signs, guardrail, and Transportation Management System (TMS) elements.

Status	Fiscal Year (FY)
In Design	24-25

Primary Work	Primary Scope
Pavement	50.1 Lane mile(s)

Activities

Asphalt Pavement Minor Rehab
Guard Rail
High Friction Surface Treatment (HFST)
Miscellaneous Drainage Work

Contact Information

District 1 - Eureka
Street Address: 1656 Union Street
Eureka, CA 95501
Mailing Address: P.O. Box 3700
Eureka, CA 95502-3700
Phone Number: (707) 445-6600
E-mail: district.1.pio@dot.ca.gov

District Project Portal	Project Details Link
Go to District Project Portal	

Google Map
Go to Google Map

2024 SHOPP Draft Projects

SHOPP ID	EA	District	County	Route	Begin Mile	End Mile	Primary Work	Program Code	Project Description	Carryover or New?	Regular or Long Lead?	Fiscal Year (FY)	Project Cost ($K
20247	0J210	1	Del Norte	101	R2.6	23.8	Pavement	201.121	Near Klamath and Crescent City, from 1.4 miles south of Klamath River Bridge to 0.1 mile south of Humboldt Road/Enderts Beach Road. Rehabilitate pavement and upgrade signs, guardrail, and Transportation Management System (TMS) elements.	Carryover	Regular	24-25	$42,56

Activities	Units	Quantity
Guard Rail	Linear Feet	15,116
High Friction Surface Treatment (HFST)	Square Yard	13,820
Miscellaneous Drainage Work	Each	19
Proactive Safety Improvements	Annual Fatal & Seriou..	1.91
	Fatal/Serious Injury C..	38.2
Repair/upgrade or new curb ramp	Each	2
Roadside Weather Information Station	Each	2
Rumble Strips	Linear Feet	149,600
Sign Panel Replacement	Each	57
Signing	Each	256
Transportation Management Systems (TMS)	Each	2
Upgrade/New Detectable Warning Surface	Square Feet	27
Worker Safety - Vegetation Control	Locations	34

Conclusion

- Caltrans looks at the complete spectrum of competing work when making asset management tradeoff decisions
- This approach relies on developing a relationship between investment and performance outcomes for all objectives.
- We believe this provides the most transparent picture of the competing needs and impact of investment decisions

Email: michael.b.johnson@dot.ca.gov


VDOT
Virginia Department of Transportation

DATA & TECHNOLOGY DRIVEN
TRAFFIC ASSET MANAGEMENT IN VIRGINIA

-

Ning Li, PHD, PTOE, PMP – Traffic Asset Program Manager
Virginia Department of Transportation

December 20th, 2023

Traffic Asset in Virginia

Critical to the Safety and Operation of Highway System

1 Million+ Signs

34,000+ Traffic Ancillary Structures

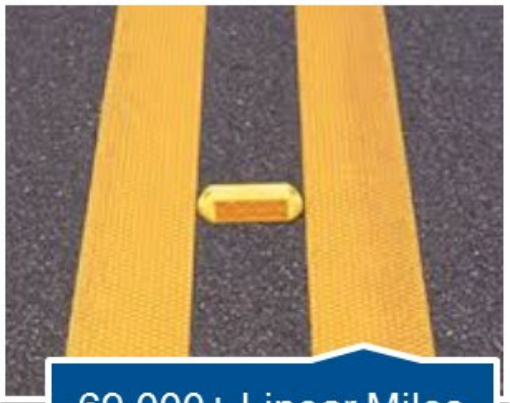
7,400+ Miles of Guardrail

3,000+ Signalized Intersections

50,000+ Roadway Lighting Fixtures

711,000+ Pavement Markers

137,000+ Pavement Messages



69,000+ Linear Miles of Pavement Markings

Traffic Assets Uniqueness and Challenges

What is Unique About Traffic Operation Assets?

- Touch every one's life every day
- Dynamic, diverse, electrical-powered, technology-driven
- Diverse geographical locations

Challenges for Managing Traffic Assets

- Large quantities and relatively low unit value
- Not required in FHWA Transportation Asset Management Plan
- Significant efforts to keep inventory up to date due to large quantities
- No or limited information on inventory and condition for traffic assets

Challenge is a Catalyst for Innovation

ADA Challenge in 2014:

- 80,000 curb ramps and 4,100 miles of sidewalks
- DOJ mandate on improvements in alteration projects
- **No inventory and condition**
- ADA Transition Plan past due
- High litigation risk
- Quality of life for vulnerable users

How Would You Bring VDOT to Compliance?

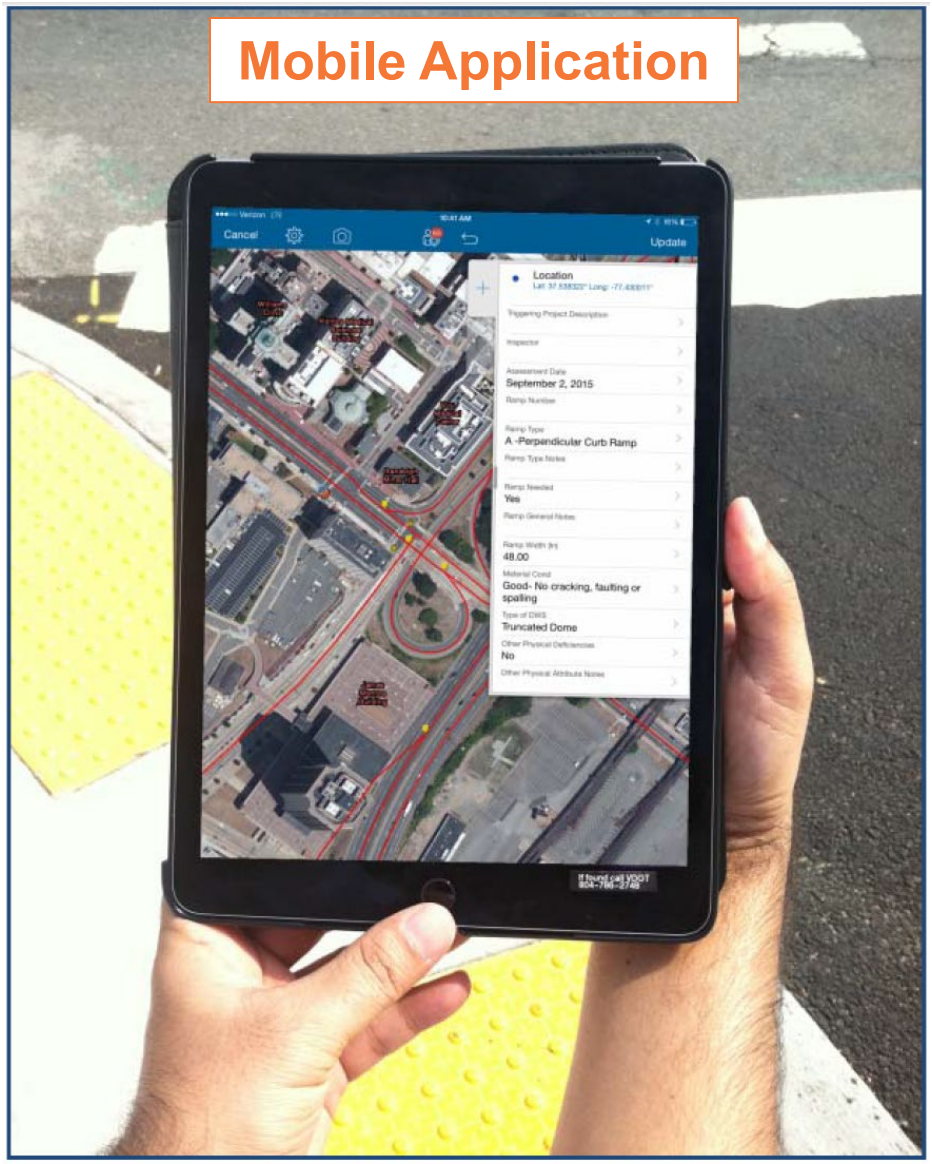
Guardrail Challenge in 2016:

- 7,400 miles of rail, 150k terminals
- **No inventory and condition**
- New MASH design standard
- High Congressional, public & media interest in outcome
- High litigation risk
- Keep Virginians safe
- Limited funding for GR improvement

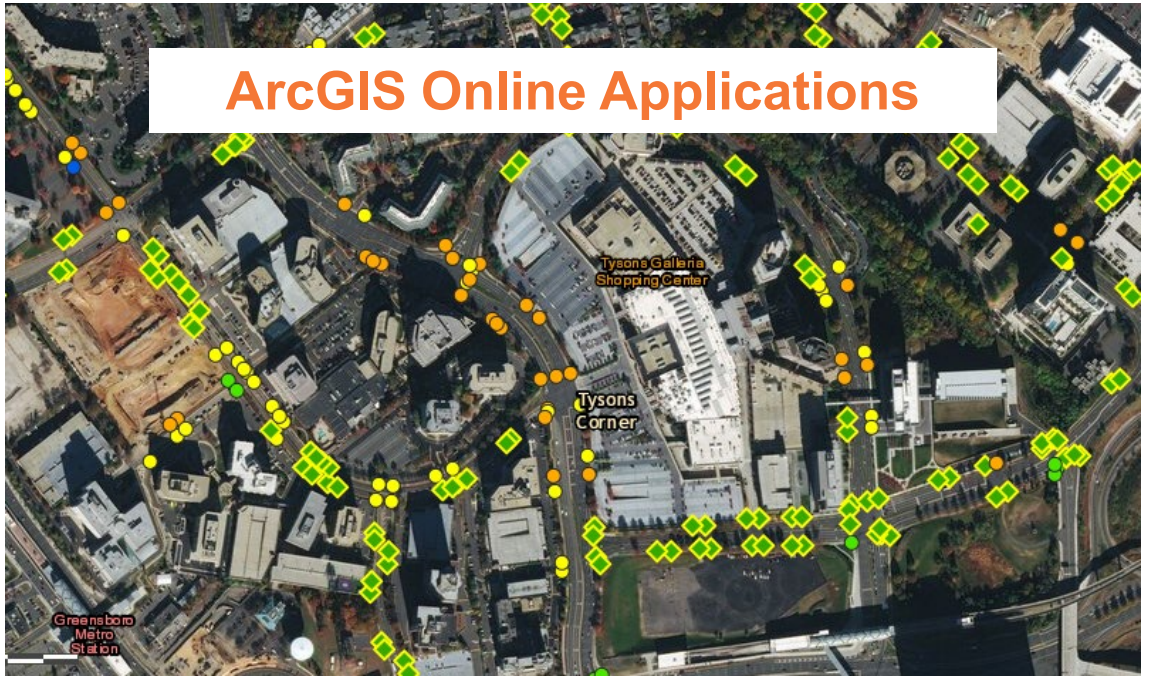
How Would You Improve Management of the Asset?

New ADA Curb Ramp Program Innovations

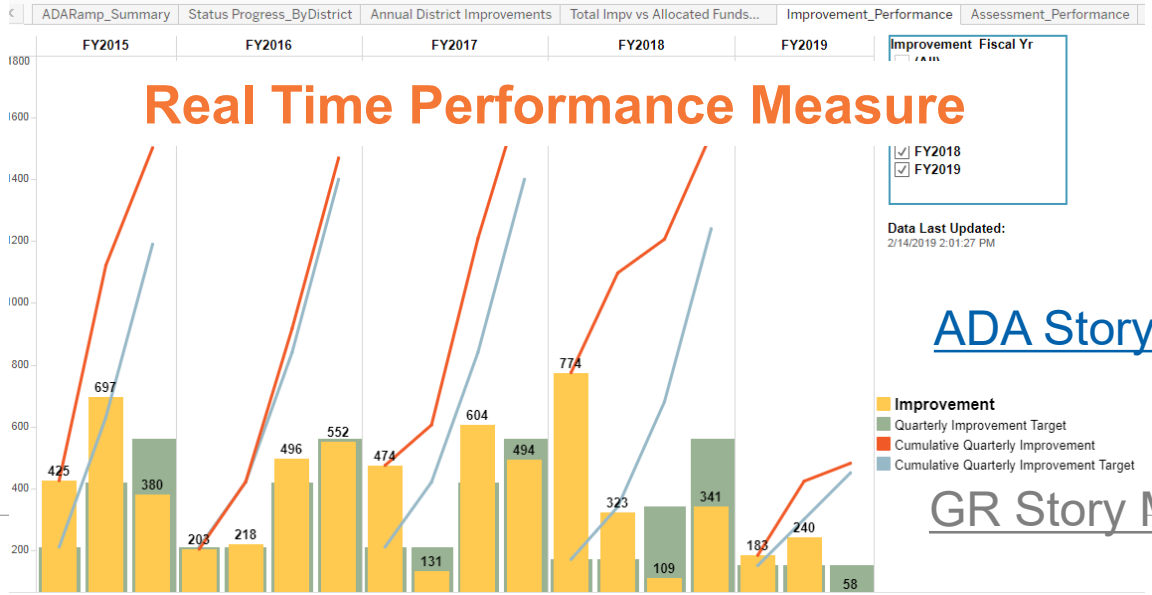
Mobile Application



ArcGIS Online Applications



Real Time Performance Measure



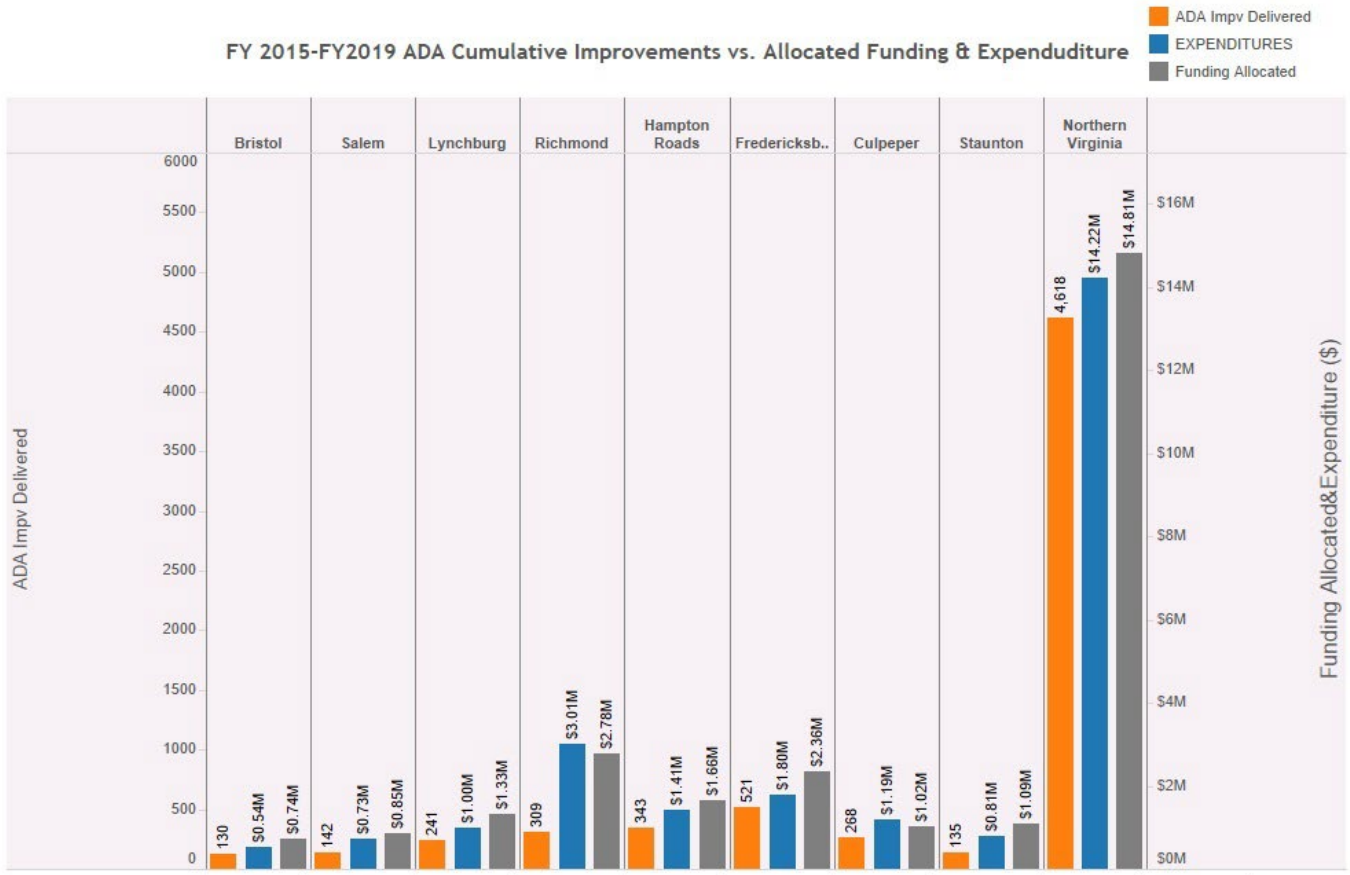
[ADA Story Map]

[GR Story Map]

ADA Curb Ramp Program Progress

	BEFORE With Traditional Method	AFTER With Innovation & Technology
Improvement	Sporadic through isolated projects	Systematic with dedicated funding
Performance & Tracking	No tracking to prove compliance	Real time tracking with performance measure, starting from CR SharePoint DB
Inventory & Condition	No inventory and condition of Barriers	Complete statewide Inventory of Barriers map in the cloud
Information Sharing	No Improvement information shared to general public	Proactive public outreach and stakeholder engagements
Efficiency & Oversight	Manual, inaccurate, and inconsistent reporting with very limited oversights	Real Time Mobile & Cloud ; 50%+ staff hours reduction; Enhanced program quality and oversight; QAQC
Litigation Risk	High Risk- not demonstrating commitment to ADA/DOJ requirements	Low Risk- Solid program in place to ensure compliance

Enhanced Program Management Through Data & Technology



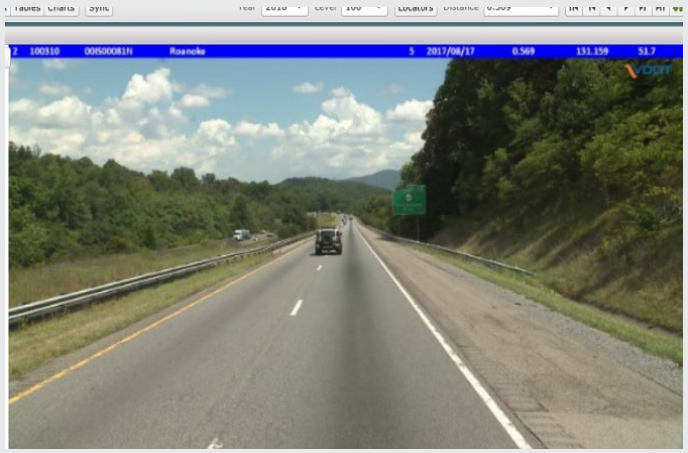
	Bristol	Salem	Lynchburg	Richmond	Hampton Roads	Fredericksb..	Culpeper	Staunton	Northern Virginia	Grand Total
Improvements Delivered	130	142	241	309	343	521	268	135	4,618	6,707
Funding Allocated	$736,729	$847,958	$1,334,340	$2,781,990	$1,658,878	$2,363,880	$1,024,515	$1,089,268	$14,807,857	$26,645,415
EXPENDITURES	$544,154	$731,275	$998,195	$3,009,147	$1,409,907	$1,795,792	$1,187,678	$808,595	$14,218,403	$24,703,147
Funding Remaning	$192,575	$116,683	$336,145	-$227,157	$248,971	$568,088	-$163,163	$280,673	$589,454	$1,942,268

- **Efficiency Improvement**
  - One cloud based statewide inventory
  - Reduced 5 FTE staff to 2 (NOVA)
- **Enhanced Oversight on Program schedule, cost and quality**
  - When and where money was spent
  - Before & After Photographs
  - Real Time Monitoring
  - Identify issues early and intervention
  - Effective Planning

Traffic Asset Program Innovations

Virtual Inventory and Condition Collection

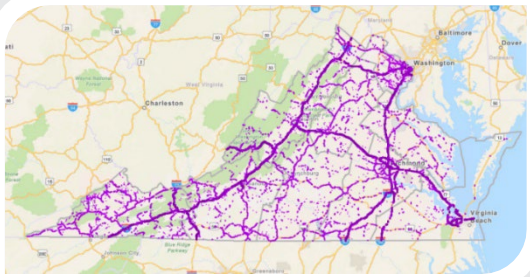
System-wide high-definition imagery from pavement assessments



Guardrail field identification manual to guide product identification

GIS tool to integration location and product information

- Boots-on-the-ground data collection takes years and millions of dollars
- Virtual collection takes a few months and a small fraction of the cost



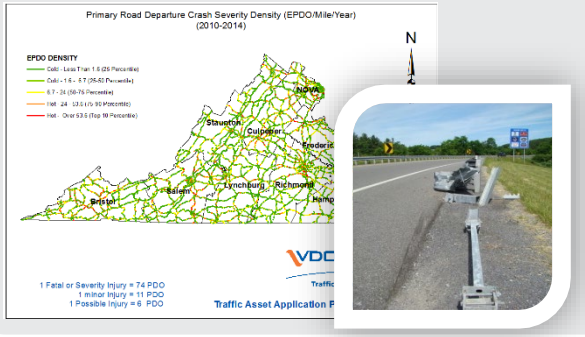
Guardrail Improvement Benefit Factor

Based on

- Guardrail condition

- Nearby pavement condition

- Crash Priority



Guardrail Improvement Benefit Factor (BF) (by Guardrail Condition, Crash Risk and Pavement Condition)						Crash Priority (and CPF)				
						Lowest	Low	Medium	High	Highest
						0.50	0.75	1.00	1.25	1.50
Guardrail Condition (and Guardrail Condition Factor)	Condition A (Fully Functional)	0.10	Pave Condition (and PCM)	Very Poor	1.00	0.05	0.08	0.10	0.13	0.15
				Poor	1.00	0.05	0.08	0.10	0.13	0.15
				Fair	1.00	0.05	0.08	0.10	0.13	0.15
				Good	1.10	0.06	0.08	0.11	0.14	0.17
				Excellent	1.10	0.06	0.08	0.11	0.14	0.17
	Condition B (Adequate)	0.50	Pave Condition (and PCM)	Very Poor	1.00	0.25	0.38	0.50	0.63	0.75
				Poor	1.00	0.25	0.38	0.50	0.63	0.75
				Fair	1.00	0.25	0.38	0.50	0.63	0.75
				Good	1.10	0.28	0.41	0.55	0.69	0.83
				Excellent	1.10	0.28	0.41	0.55	0.69	0.83
	Condition C (Deficient)	1.50	Pave Condition (and PCM)	Very Poor	1.00	0.75	1.13	1.50	1.88	2.25
				Poor	1.00	0.75	1.13	1.50	1.88	2.25
				Fair	1.00	0.75	1.13	1.50	1.88	2.25
				Good	1.10	0.83	1.24	1.65	2.06	2.48
				Excellent	1.10	0.83	1.24	1.65	2.06	2.48
	Condition D (Obsolete)	2.00	Pave Condition (and PCM)	Very Poor	1.00	1.00	1.50	2.00	2.50	3.00
				Poor	1.00	1.00	1.50	2.00	2.50	3.00
				Fair	1.00	1.00	1.50	2.00	2.50	3.00
				Good	1.10	1.10	1.65	2.20	2.75	3.30
				Excellent	1.10	1.10	1.65	2.20	2.75	3.30

Managing the Life Cycle of Traffic Asset

Guardrail Inspection

Assessing a Terminal Strike for ISPE

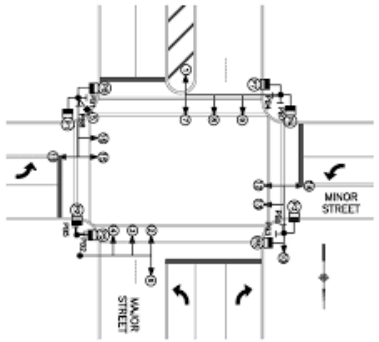
Field GR Tracker Mobile Application Users

Installing a New Guardrail Asset

[GR Story Map]

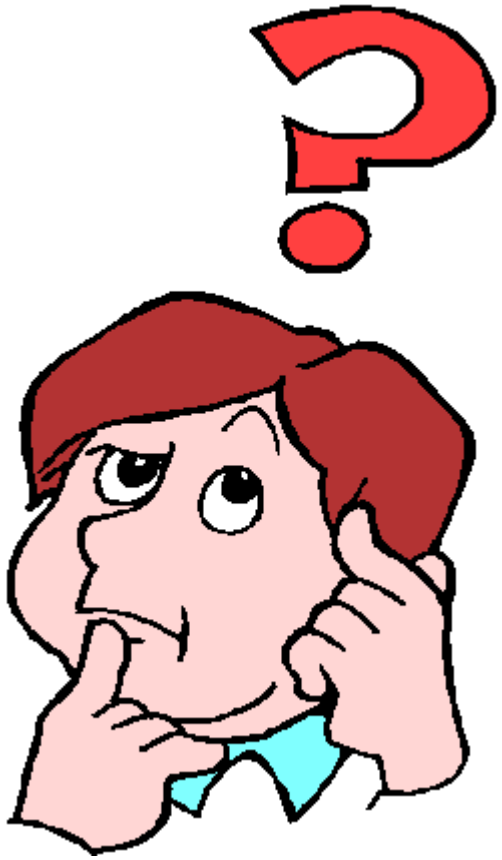
Signal Life Cycle Management Using HMMS

Signal Planning	Signal Engineering Design	Construction	Signal Maintenance	Signal Retirement
HMMS Document At signal location (Warrant Study, etc)	HMMS Document At signal location (Plan sheets)	• Signal Add into HMMS Assets	• HMMS Signal Maintenance Work Orders	• Signal Stored in HMMS but no longer active



Summary and Conclusions

- **Data Driven Asset Management dramatically improved the quality and efficiency of traffic asset management in Virginia**
- **Nationally recognized with**
  - 2016 AASHTO Vanguard Award for Innovation
  - 2019 FHWA National Road Safety Award
  - 2019 AASHTO Presidents Award
  - 2021 VDOT Commissioner Award
- **Low Cost and Scalable Solution**
  - Widely available tools and product (ArcGIS online and BI tools)
  - In house development by business unit with no IT project support



Ning Li, PhD, PTOE, PMP

Traffic Asset Program Manager

Traffic Operations Division

Virginia Department of Transportation

Ning.li@vdot.virginia.gov

COLORADO
Department of Transportation

CDOT Buildings and Other Assets

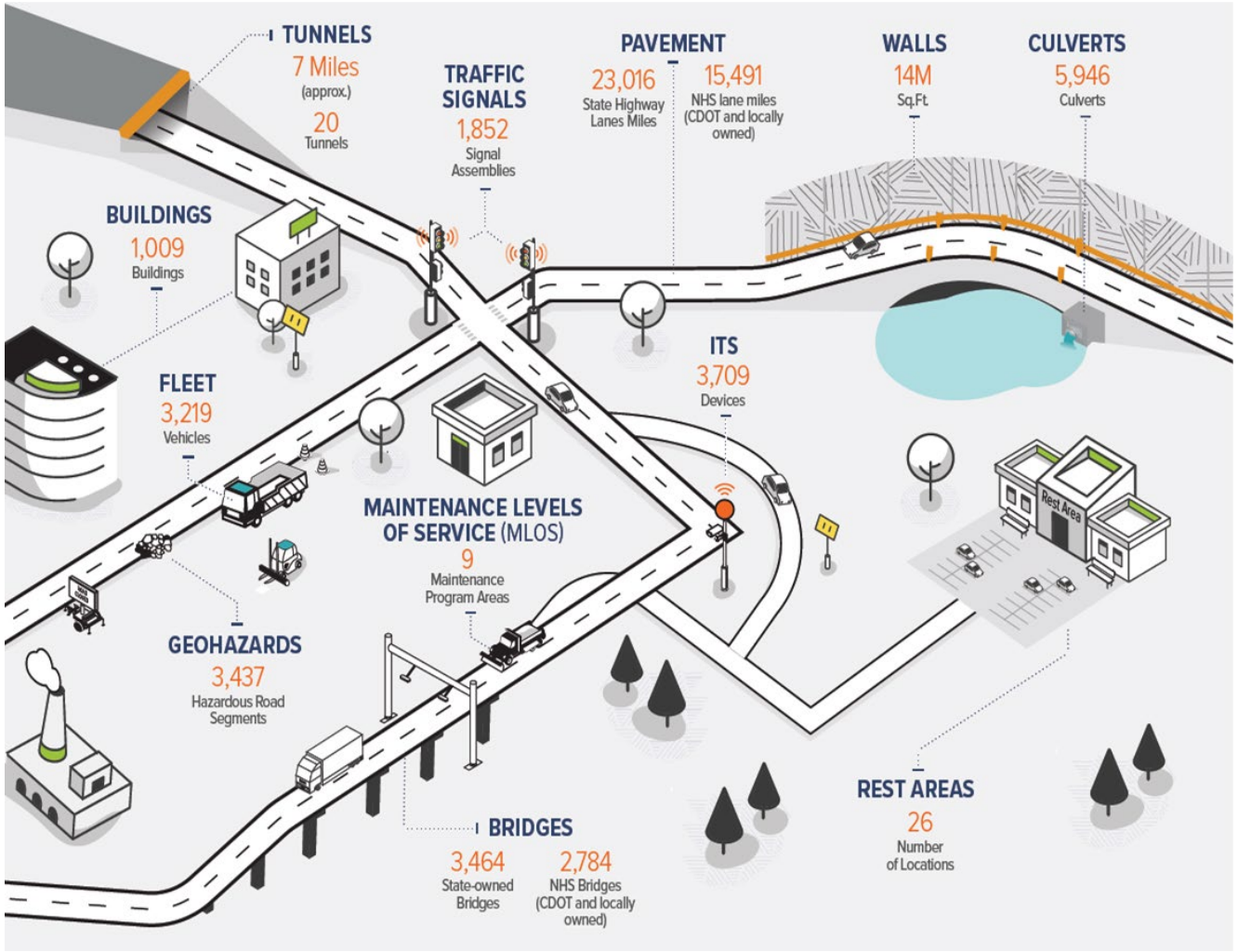
Hope Wright and Toby Manthey

12/20/23

Asset Management at CDOT

TAM Program

- Began in 2012 to implement more data and performance-driven asset investments.
- Absorbed asset programs with dedicated annual funding allocation (e.g., pavement, bridge, maintenance, ITS).
- Also incorporated other asset classes that typically requested ad hoc funding from Transportation Commission.
- Maintains executive oversight and working committees.



Asset Requirements

PD 1609.0 describes program principles and requirements.

Since the beginning of the program, assets must meet the following requirements:

- Maintain an inventory.
- Maintain a performance metric (e.g., “Good,” “Fair” and “Poor” condition ratings for bridges, or letter grades for buildings.)
- Provide a performance target.
- Maintain an asset model.
- Fund annual maintenance, preservation, rehab, and replacement activities — ***not*** expansion.

COLORADO
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Managing Buildings at CDOT

Hope Wright

12/20/23

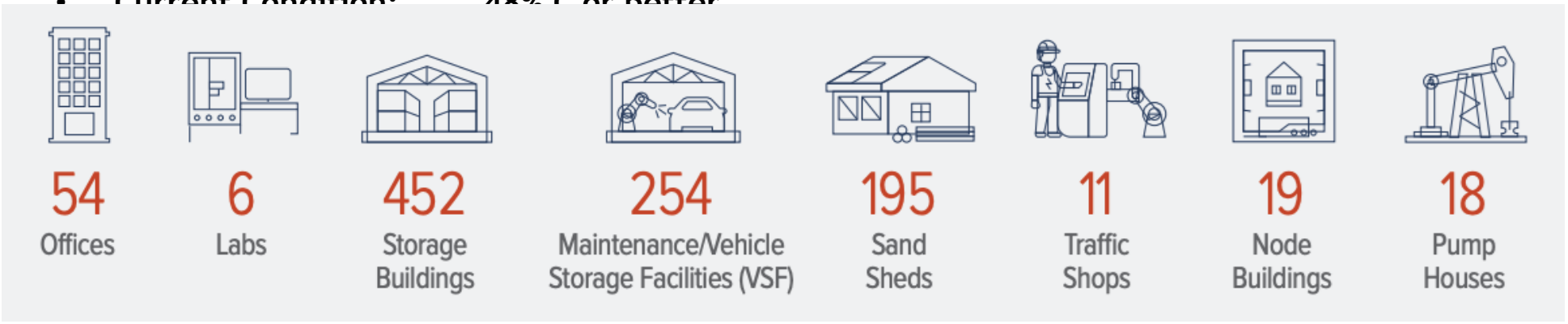
Buildings Inventory, Metric and Target

Inventory:

- About 1,009 structures.
- 520 structures in model: Sand sheds, maintenance/traffic buildings, and offices/labs.

Metric and Target:

- Condition scored using building and component condition, performance and expected life cycle
  - Metric: Letter grade (A to F)
  - Target: ≥ 85% of buildings C or better
  - **Current Condition: 48% C or better**



Buildings: Asset Overview

Only 30% of Maintenance and Traffic Buildings are Functional

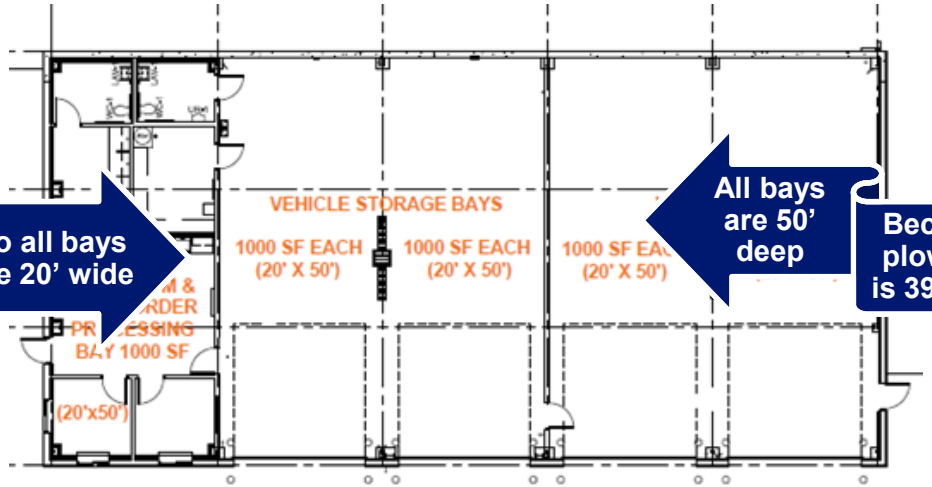
Functional buildings allow patrols to store plow truck with front and side plows, which:

- ★ Expedites snow event response
- ★ Slows deterioration of essential equipment
- ★ Increases worker safety and efficiency
- ★ Increases staff morale

Building Condition = Functionality

A plow truck is 17' wide

So all bays are 20' wide



All bays are 50' deep

Because a plow truck is 39.5' long

Buildings: Risk of Funding Shortfalls

Building Functionality Impacts Operations

- Decreased level of service
- Shortened equipment Life
  - Harsh elements and UV exposure
- Employee turnover
  - From unsafe working conditions
- Workplace injury
  - Lack of serviceable space to work on equipment
- Fewer plows on the road
  - Employee turnover and equipment reliability

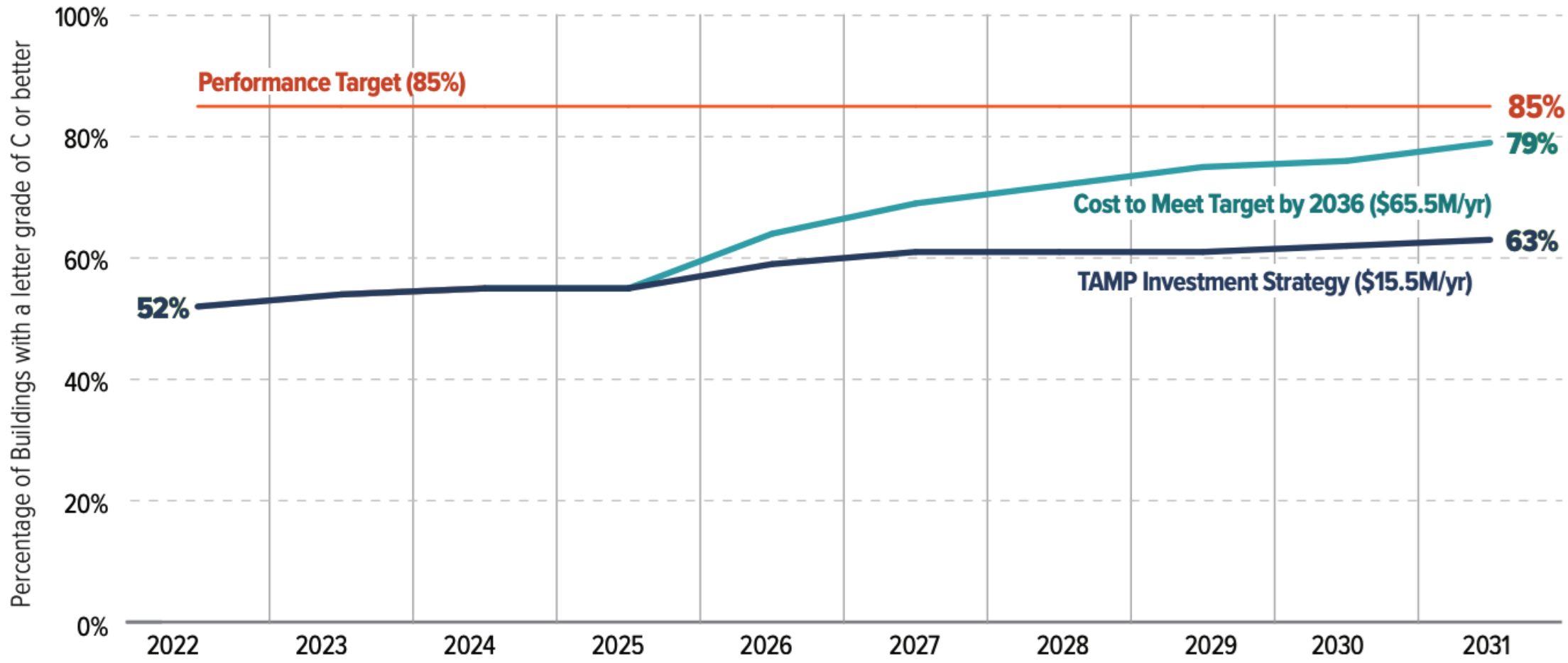
Buildings: Performance and Budget

FY14-FY27 Buildings Planning Budgets (in Millions)													
FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
$12.0	$17.0	$12.9	$21.4	$17.5	$20.2	$17.6	$18.1	$16.7	$17.8	$17.0	$15.5	15.5	15.5

Historical Performance % of Buildings Letter Grade C or better							
2015	2016	2017	2018	2019	2020	2021	2022
80%	74%	83%	80%	80%	55%*	49%	48%

*Evaluation criteria updated to accurately reflect integrity and functionality

Buildings Forecast



Project-Selection Process

Transportation Commission adopts Asset Management Planning budgets

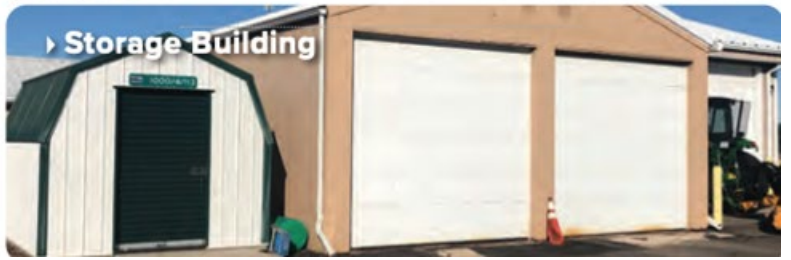
Projects are prioritized for the **Annual Property Plan** through model recommendations.

Asset Manager creates **Annual Property Plan**

- 15-20% **Preventative Maintenance**
- 1-2% Code Review
- 78-84% **Projects**

Annual Property Plan distributed to Regions

Annual Property Plan



Overcoming Challenges

CHALLENGES

- **IMMEDIATE NEEDS CAN TAKE PRECEDENCE OVER ASSET MANAGEMENT:**
- Backlog of poor or non-functional assets (Buildings and Rest Areas) can lead to replacements over rehabs.
- Leadership priorities

INFLATION/CONSTRUCTION COSTS INCREASES

- 14% increase FY20 to FY21
- 53% increase FY21 to FY22
- Supply chain issues, labor shortages and raw material costs increases
- Unable to predict future costs

AFFORDABLE EMPLOYEE HOUSING

- Strategy to assist with employee recruitment and retention
- Adds inventory and projects outside of asset model

GREENING OF STATE GOVERNMENT

- Energy contracting
- LED retrofits
- High-Performance Certification Program

Questions?

Thank you!

Q&A and Discussion

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