

Risk Busters: Unleashing the Power of Effective Organizational Risk Management

Webinar 2 developed from: Identifying & Managing Financial Risks in a Transportation Asset Management Plan (TAMP)



U.S. Department of Transportation
Federal Highway Administration

Disclaimers

- Except for the statutes and regulations cited, the contents of this presentation do not have the force and effect of law and are not meant to bind the States or the public in any way. This presentation is intended only to provide information regarding existing requirements under the law or agency policies.
- This presentation was created and is being co-presented by both the FHWA and outside entities. The views and opinions expressed in this presentation are the presenters' and do not necessarily reflect those of the FHWA or the U.S. Department of Transportation (USDOT). The contents do not necessarily reflect the official policy of the USDOT.

Webinar Approach

- **Webinar 1:** Don't Let Financial Uncertainty Derail Your TAMP: Strategies for Identifying & Managing Financial Risks
 - 5/29/2024
- **Webinar 2:** Risk Busters: Unleashing the Power of Effective Organizational Risk Management
 - 6/24/2024

Learning Outcomes

- Identify the types of financial and organizational risks that impact asset management planning
- Describe the potential impacts that financial and organizational risks can have on TAMP investment strategies
- Compare approaches for managing financial and organizational risks

Webinar 2 Topics

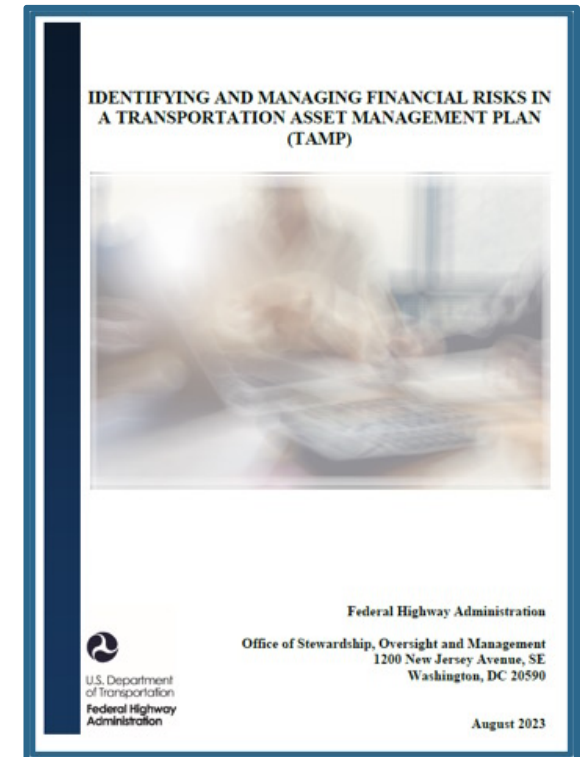
- Project Overview
- Common Organizational Risks
- Indiana DOT Case Study: Organizational Approach to Implementing Asset Management & Managing Risk
 - Louis Feagans
- Minnesota DOT Case Study: Consideration of Risk in Managing Ancillary Assets
 - Trisha Stefanski
- Question & Answer Session

Project Overview

- **The project focused on:**
 - Producing case studies illustrating strategies State DOTs use to manage major funding uncertainty
 - Identifying analysis inputs & methods that can be used by other State DOTs to manage funding uncertainty
 - Showcasing TAM practices that lead to the successful implementation of TAMPs
- **It involved:**
 - Literature review
 - Case study development
 - Summary report development
 - Webinar development & delivery

Resources Available

- **Case Studies on Financial Risks**
 - Florida DOT
 - Michigan DOT
- **Case Studies on Organizational Risks**
 - Minnesota DOT
 - Indiana DOT
- **Summary Report**
 - Identifying & Managing Financial Risks in a TAMP
- **Access these resources on FHWA's website under Asset Management Resources:**
<https://www.fhwa.dot.gov/asset/resources.cfm>



Common Organizational Risks

- **Resource Issues**

- Such as loss of institutional knowledge, skills not keeping pace with industry changes, and supplier workforce adequacy

- **Informational Risks**

- Such as the capacity and reliability of the computer network, delays in adopting new technology, data quality issues, or inadequate/failing business systems

- **Other**

- Such as resistance to change, changes in political or management philosophy, and program delivery issues

Managing Organizational Risks

- Organizational Approach to Implementing Asset Management & Managing Risk – Indiana DOT
 - Louis Feagans, Managing Director of Asset Management
- Consideration of Risk in Managing Ancillary Assets – Minnesota DOT
 - Trisha Stefanski, Asset Management Engineer

Organizational Approach to Implementing Asset Management and Managing Risk

Presented by: Louis Feagans, P.E.
Managing Director of System Performance
and Transportation Policy

Outline

- Background
- Organizational structure
- Aligning programming with TAM
- Asset management tools
- Risk management outcomes
- Next steps



Background

Background - Challenges

- Declining conditions
- Lack of coordination between planning and programming
- Lack of balance between preservation and major treatments
- Project-centric approach
- Outdated project scoping techniques

Background - Opportunities

- MAP-21 and NHPP requirements since 2012
- Next Level Indiana funding bill in 2017
 - Organizational motivation to improve
 - 10-year funding
 - 20-year State of Good Repair targets

Implementation Efforts

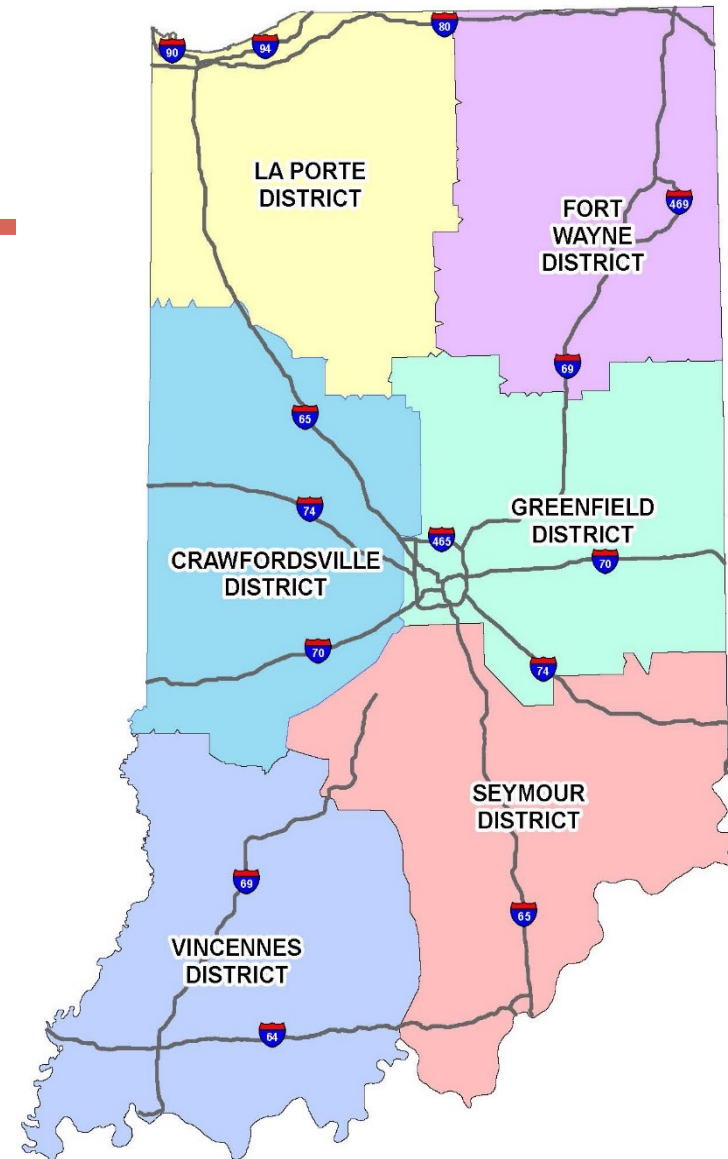
- Re-organization
- Improved program coordination
- New tools to support the process



Organizational Structure

INDOT Districts

- Six district offices and a central office
- 29,140 total roadway lane miles
- 5,771 INDOT owned and maintained bridges
- Impacts cities, towns, and communities in all 92 Indiana counties
- Connects people, drives economic growth, and improves quality of life



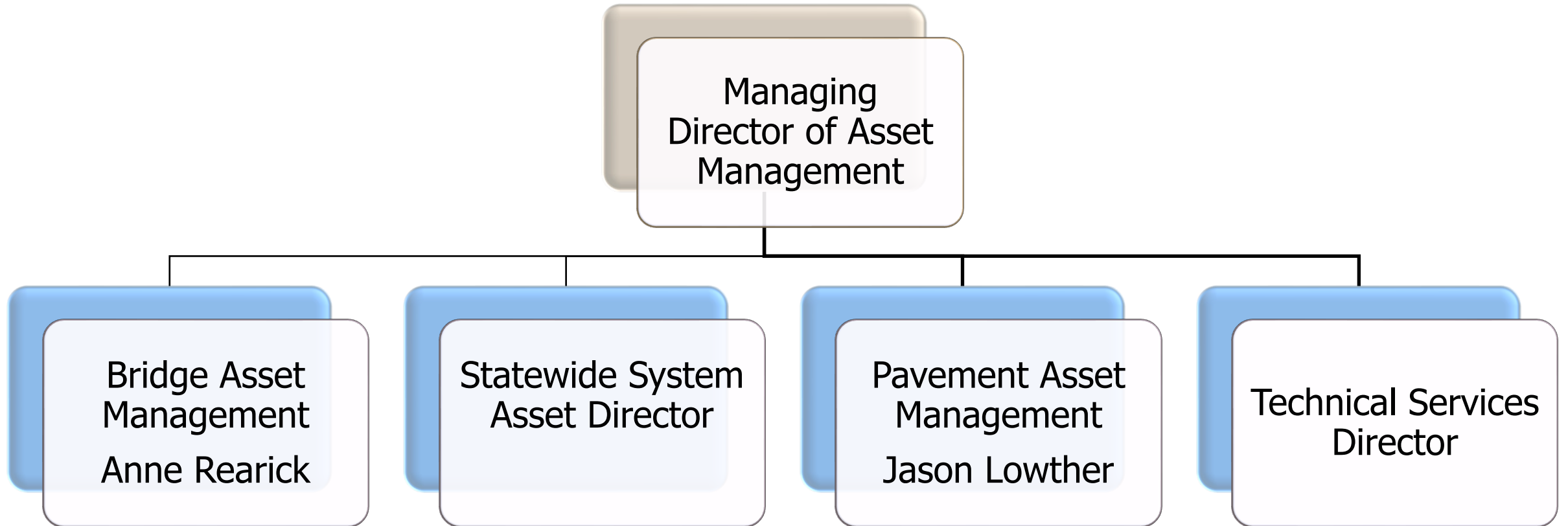
Challenges Prior to 2017

- Undefined roles and authorities
- Independent procedures and objective
- Only Asset awareness of Federal requirements
- Uncoordinated project development process
- Lack of consideration for programmatic implications
- No Rules or long range goals

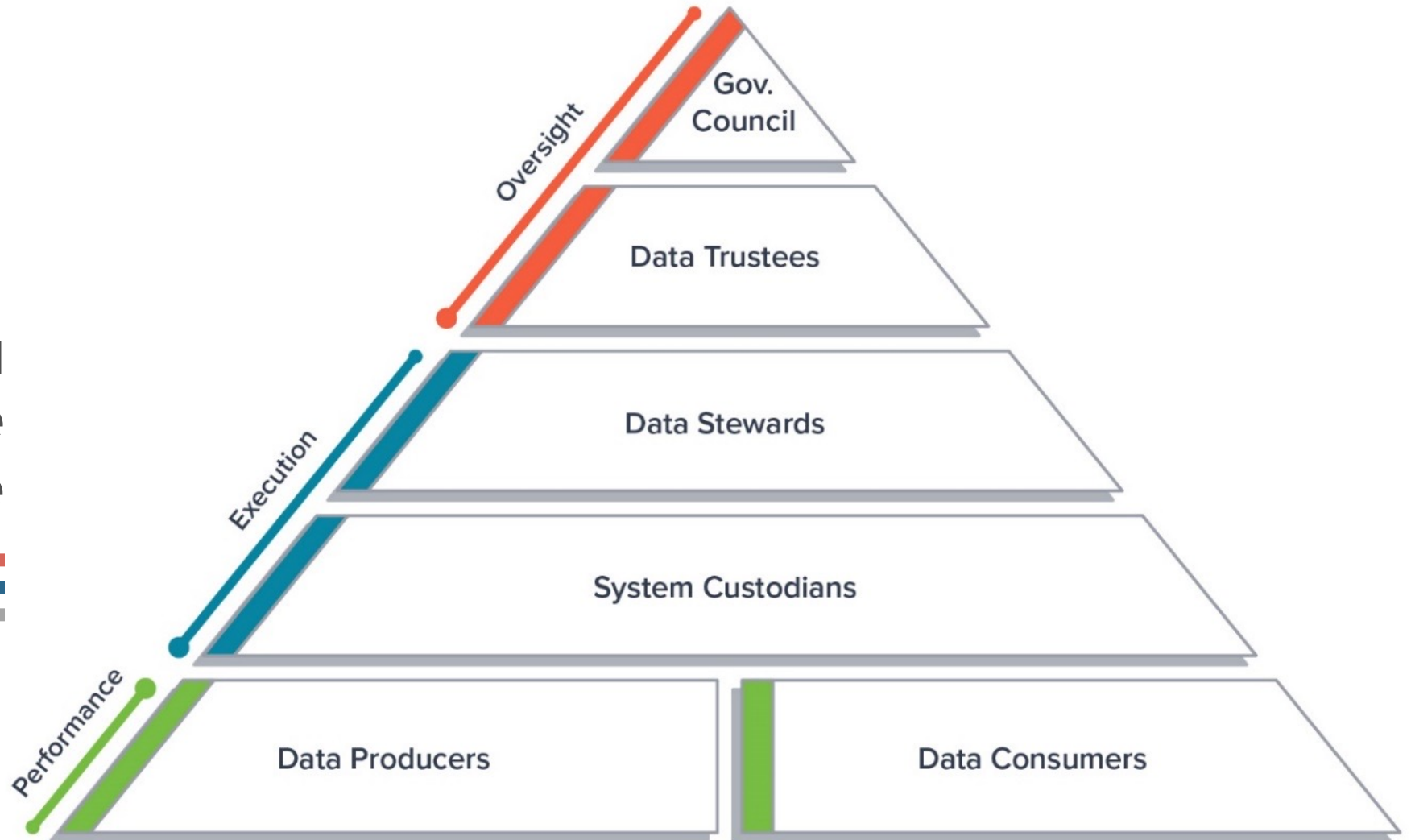
Established in 2017

- Develop life-cycle strategies
- Provide project and treatment recommendations
- Support project scoping/Single scope
- Track implications of project-level decisions on program-level outcomes

Asset Team

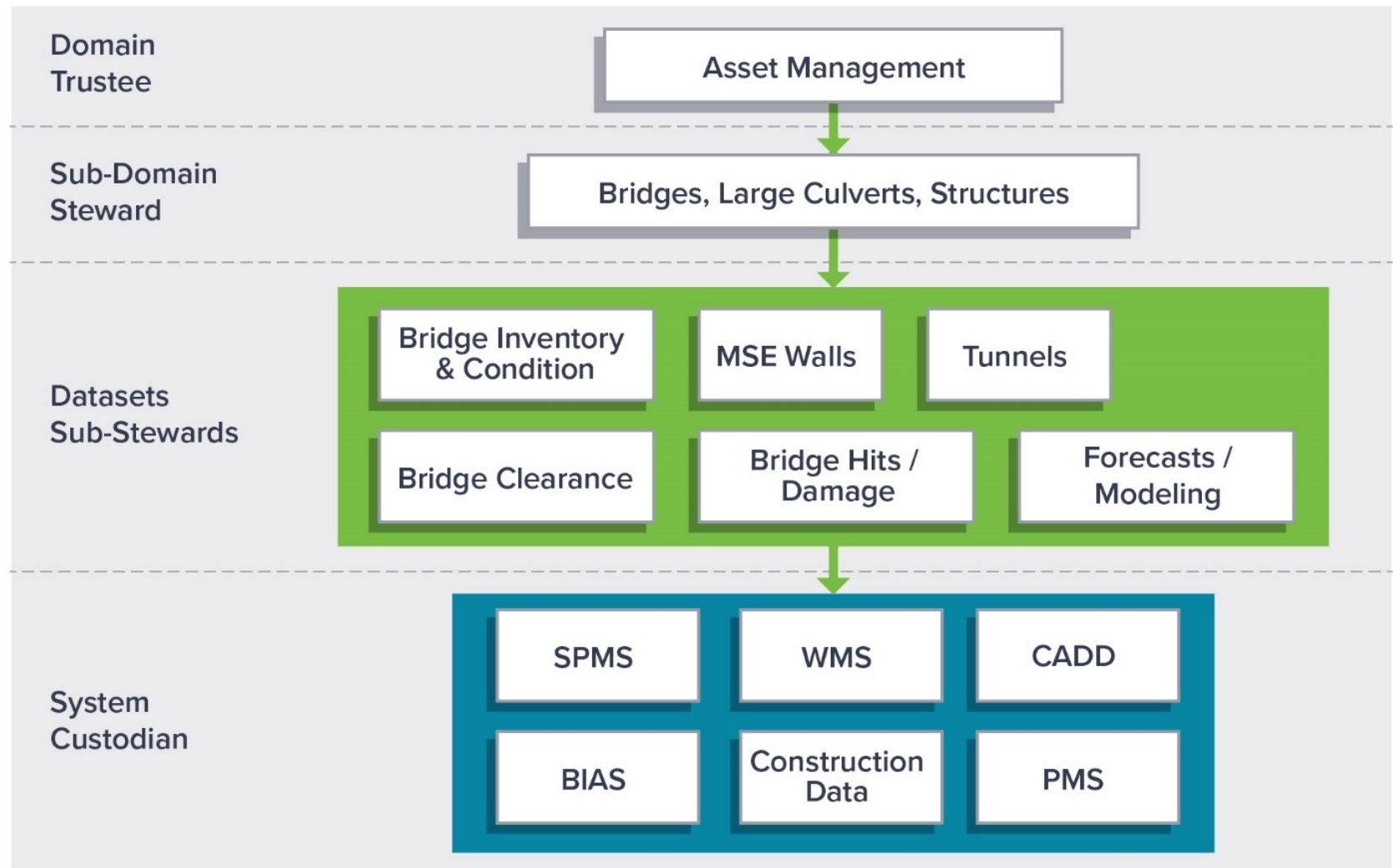


Data Governance Structure



Source: Indiana DOT

Flow of Data Governance Model



Source: Indiana DOT



Aligning Programming with TAM

20-Year Life-Cycle Strategies

- Provide an overview of life-cycle planning and investment decisionmaking processes
- Document the business rules and considerations used to determine treatment strategies
- Identify the various treatment types for consideration
- Consider both capital and operating expenditures
- Evaluate the costs associated with investment options

Project Scope, Prioritization, and Program

- Manage scope throughout project development
- Prioritization and program
 - Pavement programming
 - Bridge programming

Project Bundling

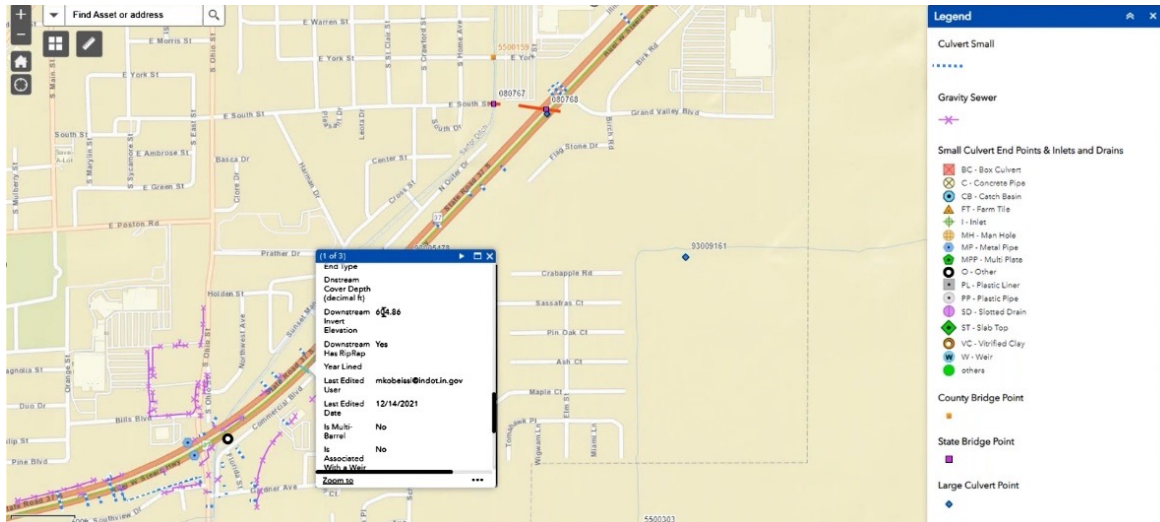
- Machine learning algorithm in 2017 working FORGO and EDC
 - Identify erroneous assumptions
 - Calculate a district rating sheet (scorecard)
- Benefits
 - Reduces customer impact, construction costs, and internal manpower limitations
 - Reduces inconvenience for the traveling public
 - Improves public perception of the agency
 - Reduces costs. INDOT study showed the project cost was 8.5 to 9 percent higher than if it had been bundled
- Approaches
 - Geographic
 - Corridor
 - Work type



Tools to Support Asset Management

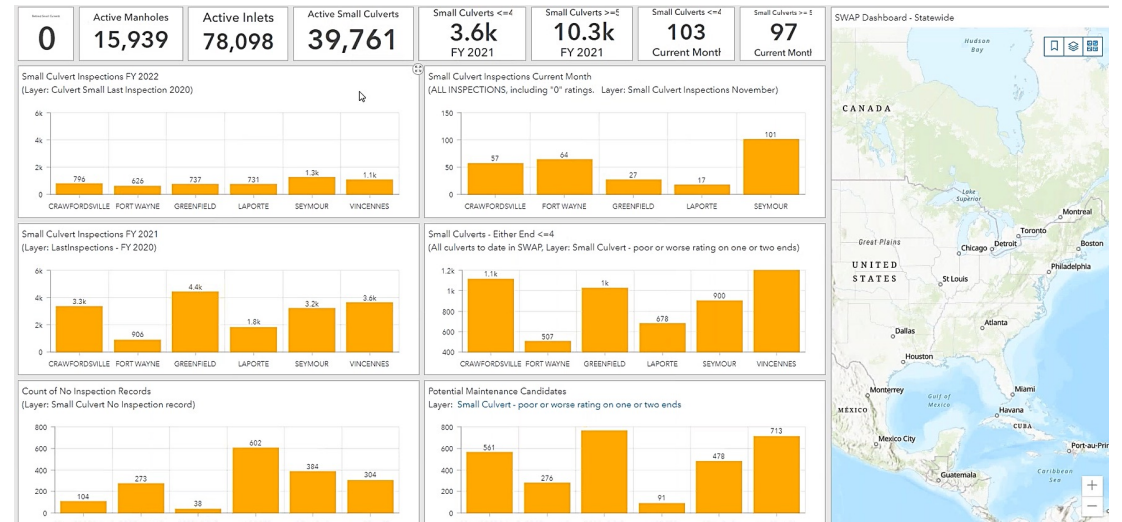
Drainage Asset Viewer

(a) map view



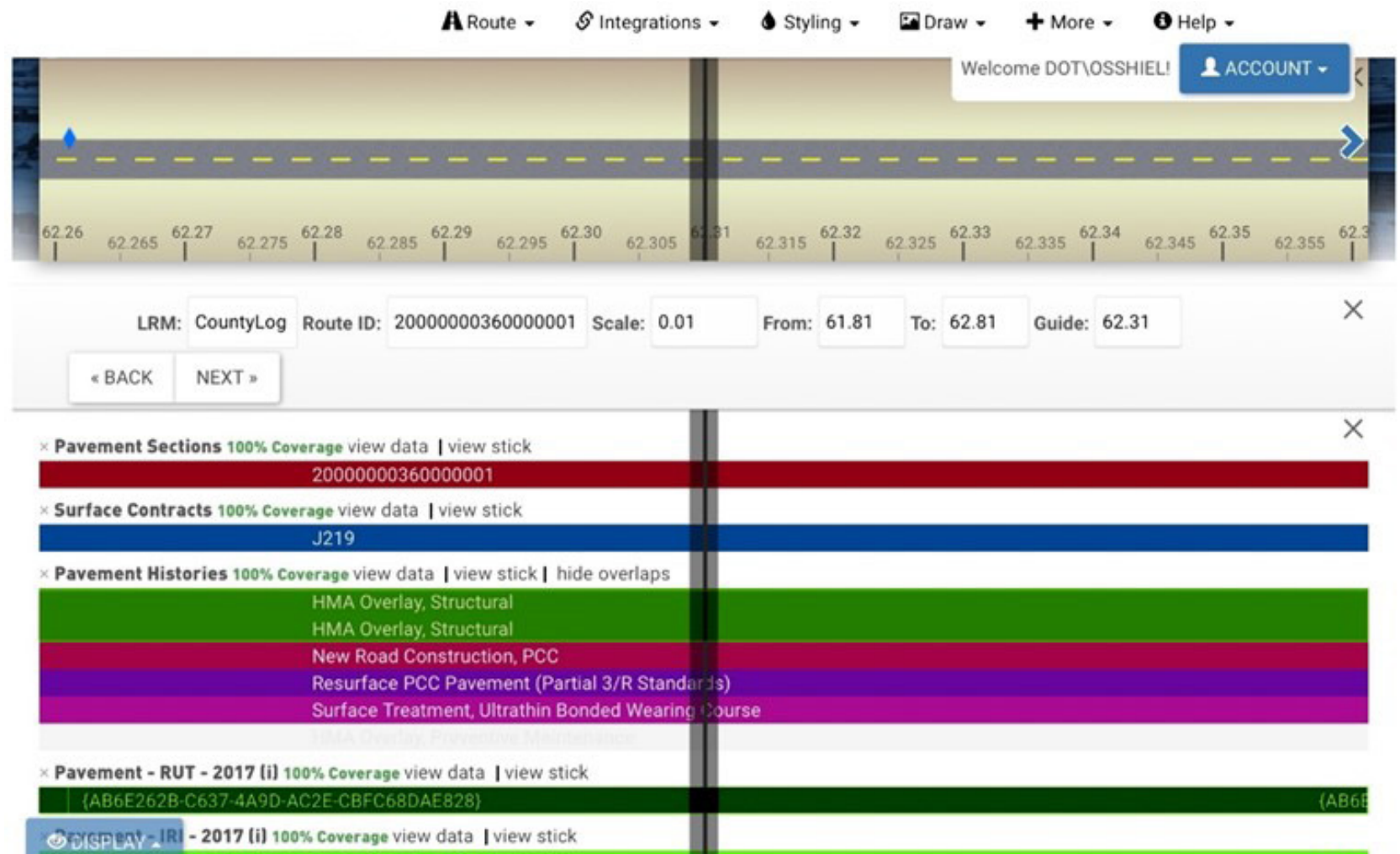
Source: Indiana DOT

(b) summary



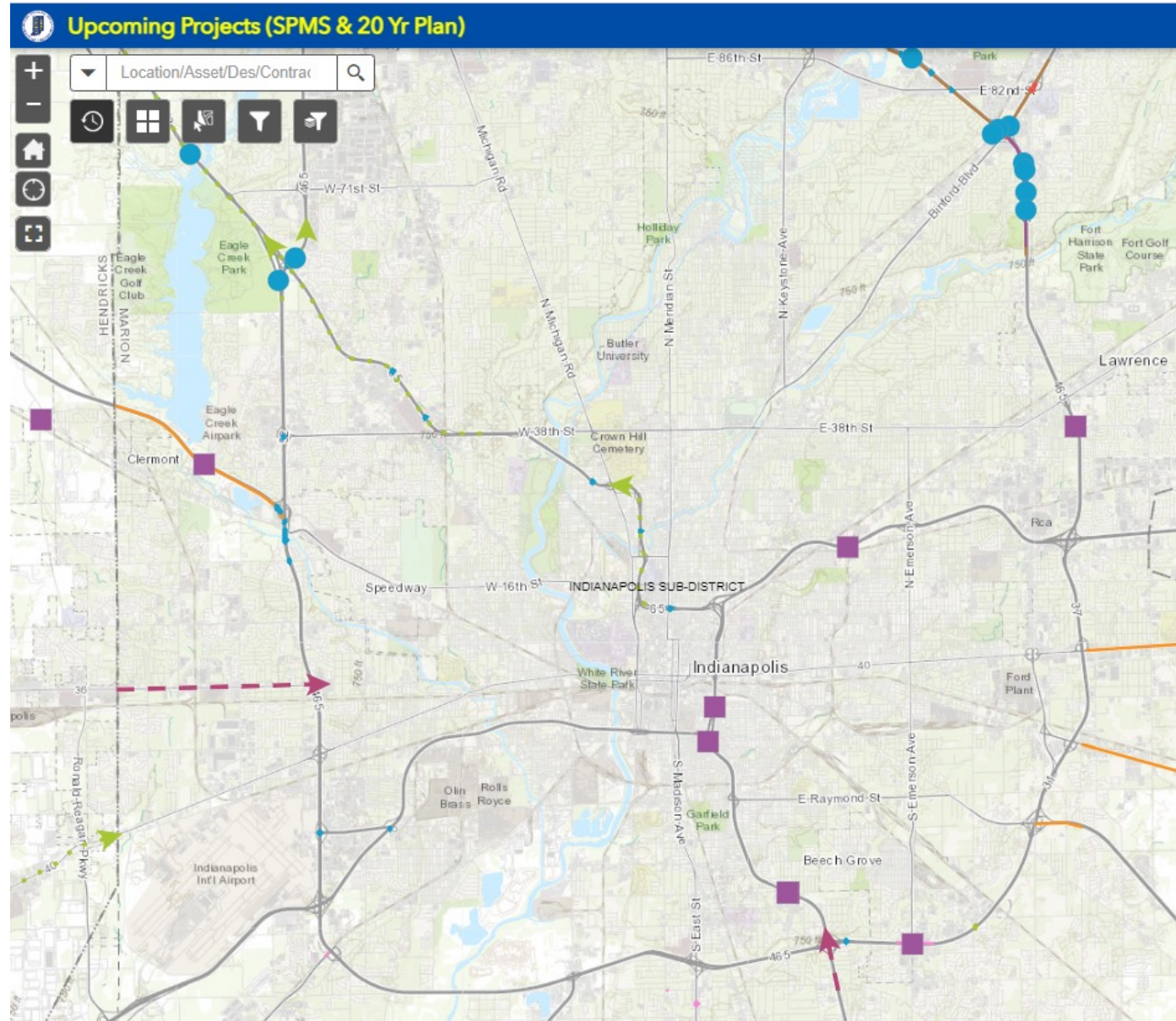
Source: Indiana DOT

Straight Line Diagram Analysis Tool




Source: Indiana DOT

20-Year Plan Editor



Source: Indiana DOT

Project Scoping Application


Indiana Department of Transportation
INDOT Project Scoping Application
Bridge / Large Culverts Information

[Home](#) / [Field Edit 080336](#) / [Bridge 8938](#)

Not Started
In Progress
Prepared
Signed
Approved
Retracted

Details
Purpose and Need
Recommendations and Costs
Additional Comments and Signatures

Bridge Scoping Application, model run date "7/27/2020"

Last Edited Date	2/12/2020	Work Type
Last Updated By	System, [redacted]	Work Category
Proposed FY	<input type="text" value="2025"/>	Score
Record ID	10585	NBI #
Call Status	Interfaced to SPMS Call	

Bridge Project Details

CN Cost [redacted]		CN Cost Modified
Year [redacted]		Year Modified
WorkType [redacted]		Work Type Modified

Bridge Attributes

AADT	9,605	AADT Truck
On NHS	1 - Is on the NHS	Functional Class
District	VINCENNES	Sub
County	14 - Daviess	Route
Reference Post	83	Offset
Latitude	38.899	Longitude
Existing Structure	I69-083-09444 SB	
		Structure Type

Source: Indiana DOT

Scheduling and Project Management System (SPMS)































Work Area Maintenance - Scheduling Project Management System - Google Chrome

spms.indot.in.gov/spms/CapitalBudgeting/CallWorkArea/WorkAreaMaintenance/?id=1102&cwaid=1040&name=Asset%20Team&yr=2026

Crawfordsville	\$88,224,240.00	\$88,224,240.00	\$0.00	\$0.00
Fort Wayne	\$58,241,409.00	\$58,241,409.00	\$0.00	\$0.00
Greenfield	\$48,719,361.00	\$48,719,361.00	\$0.00	\$0.00
LaPorte	\$111,865,991.00	\$111,865,991.00	\$0.00	\$0.00
Seymour	\$116,643,289.00	\$116,643,289.00	\$0.00	\$0.00
Vincennes	\$60,036,534.00	\$60,036,534.00	\$0.00	\$0.00
Multiple Districts	\$0.00	\$0.00	\$0.00	\$0.00

Save & Refresh Summary

Work Area Projects Team Selected:113, Not Selected:0 CPM Team Selected:113, Not Selected:0 Check All Uncheck All

AT Include Project In Total	CPM Include Project In Total		Des #	Contract #	NBI #	Structure #	Route Name	Location	District
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	    	2100165				US 421	S. Jct of SR 14 to N. Jct of SR 14	LaPorte
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	    	2100166	43942			SR 44	0.45 mi W of US 27 W junct (WCL Liberty) to US 27 W junct	Greenfield
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	    	2100167	43967			I 64	3 Culvert Locations on I64; 0.17 mi E. SR 145, 4.51 mi E. SR 145 and 4.54 mi. E. SR 145	Vincennes
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	    	2100168	43995			SR 64	From 1.01 mi E. of US 41 (Brown St) to 2.88 mi E of US 41 (Lake Road)	Vincennes
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	    	2100169	43979			SR 66	From 2.52 mi W. US 231 (W. City Limits Rockport) to 1.19 W. of US 231	Vincennes
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	    	2100170	43746			SR 60	2.86 miles W of SR 335 to SR 335	Seymour

Source: Indiana DOT



Outcomes & Next Steps

Risk Management Outcomes

Prior to 2017

- Uncertainty regarding the roles different organizational units played in addressing these issues
- Uncertainty related to project scopes, schedules, and costs
- Uncertainty about how individual projects supported achievement of broader network goals

Since 2017

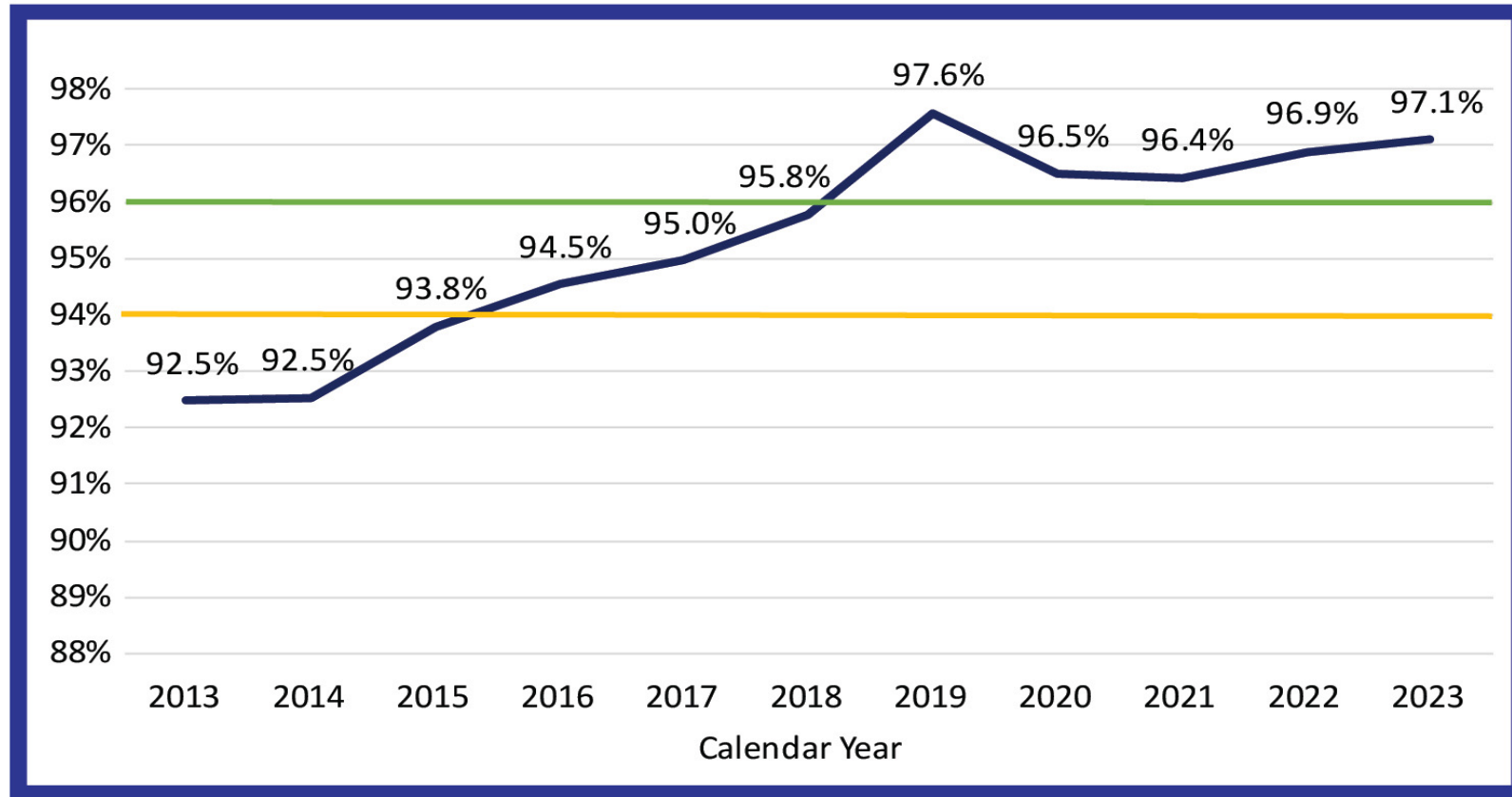
- Clarified roles and responsibilities
- Relied on data governance and documented processes
- Documented 20-year life-cycle strategies
- Improved transparency and accountability for staff and external stakeholders
- Improved consistency in decisionmaking and full access to needed data
- Included collaboration of the area engineers with district staff

Next Steps

- Move beyond pavements and bridges and include other assets in performance-based management
 - Start with large culverts which has a comprehensive inventory of these assets, including condition and performance modeling
 - Several minor assets can be effectively managed without one or more of the key data sets for asset management
- Address uncertainty and variability related to funding
- Establish forward-looking needs-based budgets to balance expenditures across multiple programs
- Include multi-objective decision analysis process

Conditions – Bridges

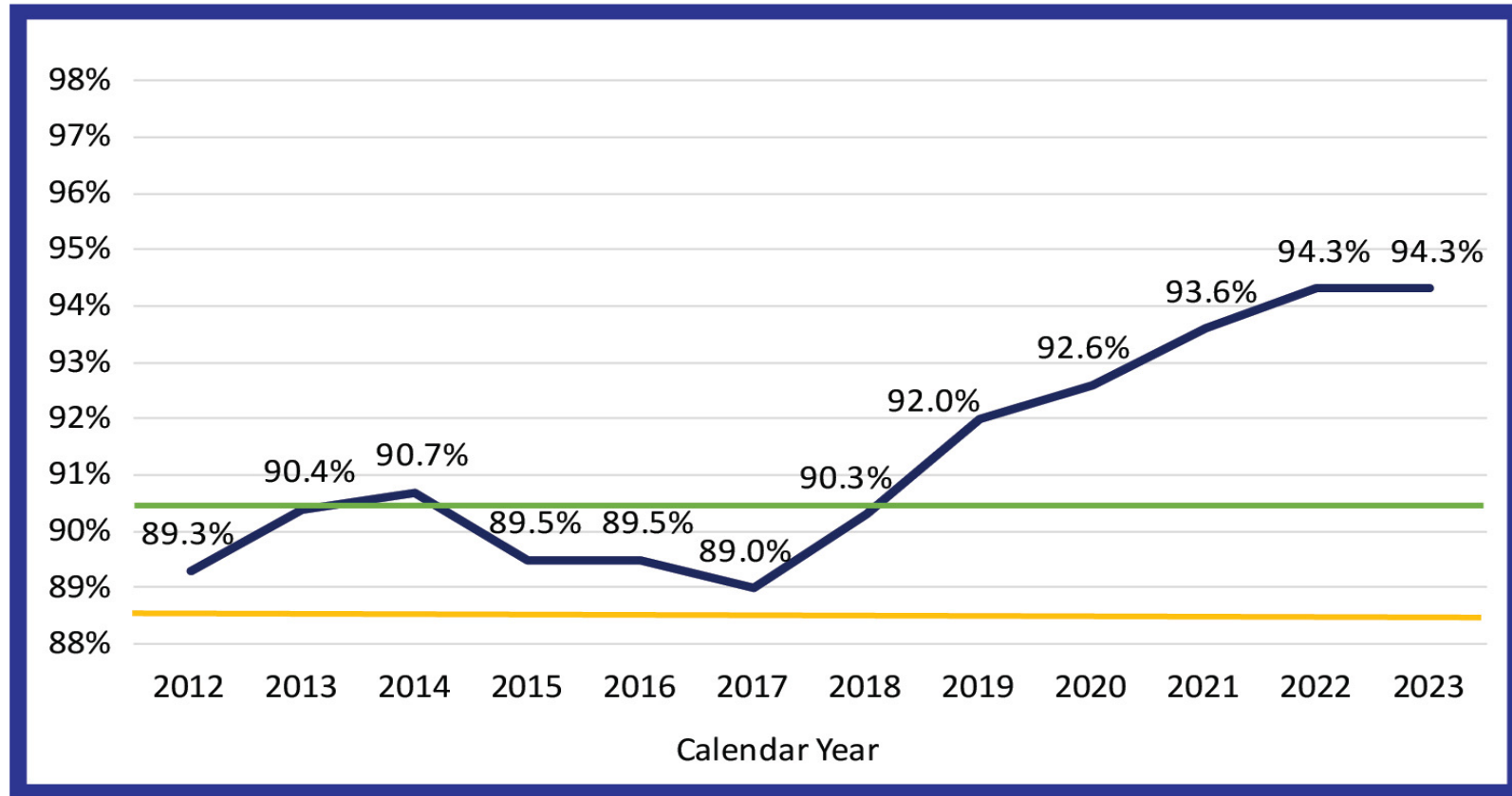
Well-Maintained Bridges



Percentage of bridges with all elements (deck, superstructure, substructure, wearing surface, and culvert) rated at 5 or above on the Federal Highway Administration NBIS bridge rating scale, reported cumulatively.

Conditions – Roads

State-Controlled Roads in Fair or Better Condition



Percentage of state-controlled roads in fair condition or better, based on International Roughness Index, which measures pavement roughness in inches per mile, reported annually.

Question & Answer Session



Consideration of Risk in Managing Ancillary Assets

Presented by: Trisha Stefanski, P.E.
Asset Management Project Office

Outline

- Background
- Risk analysis
- Recommendations
- Risk management outcomes
- Next steps

The background features a large, dark blue, curved shape on the left side, resembling a stylized letter 'C' or a partial circle. This shape is set against a light yellow background. Several thin, curved lines in blue and red are scattered around the main blue shape, adding a sense of motion or design. The word "Background" is written in a bold, white, sans-serif font, centered horizontally within the dark blue area.

Background

Background – Ancillary Assets

- Long history of going beyond minimal Federal requirements
 - 6 assets in 2014 TAMP
 - 12 assets in 2019 and 2022 TAMPs
- Implementation of enterprise asset management
- Integration with existing planning processes

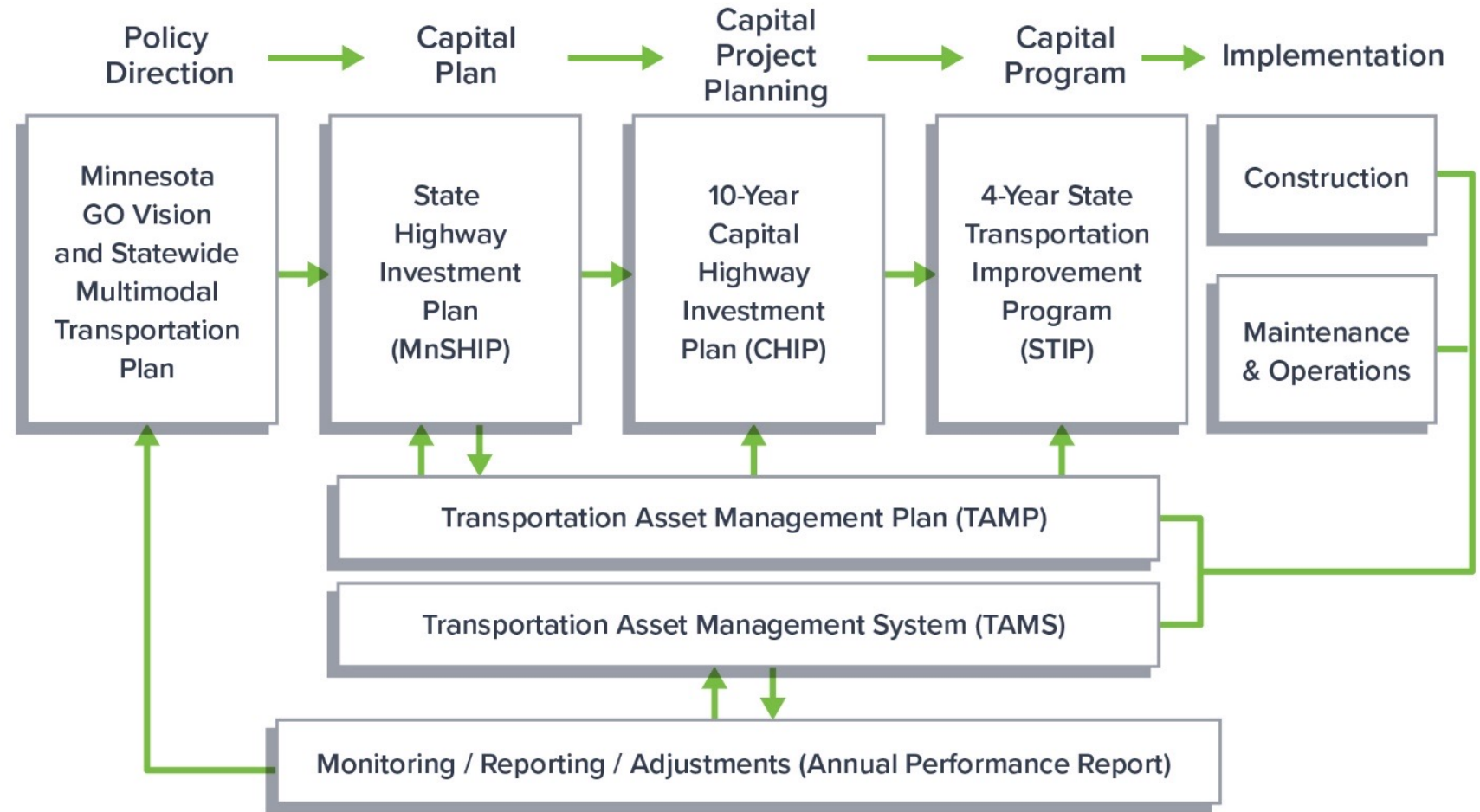
2022 TAMP includes the 12 asset classes:

- Pavements
- Bridges
- Culverts
- Deep Stormwater Tunnels
- Overhead Sign Structures
- High-Mast Light Tower Structures
- Noise Walls
- Signals
- Lighting
- Pedestrian Infrastructure
- Buildings
- Intelligent Transportation Systems

Background – Objectives

- Balance the resources required to determine risks and return on investment for assets
- Improve the ability to evaluate trade-offs between investment options in a consistent and transparent way
- Integrate asset management into agency culture through effective communication and a skilled workforce

Background – Coordination with Planning Efforts



Source: Minnesota DOT (2022)



Risk Analysis

Potential Risks

- Higher life-cycle costs and lower service of assets
- Unpredicted failures due to limited inventory and condition data
- Increases in long-term cost of system preservation
- System inefficiencies due to lack of well-defined roles and responsibilities
- Inconsistencies between the planned and implemented investment strategies
- Underestimation of maintenance and operational needs negatively impact the agency's credibility with stakeholders

Formation of Working Groups

- **Matrix Development** – Establish a prioritized approach based on agency practice, relative importance, and the associated risks
- **Geotechnical Assets** – Evaluate options to manage geotechnical assets in compliance with a State legislature
- **Pavement Preservation** – Establish a plan to increase the preventive maintenance treatments to reduce the life-cycle costs
- **Communication** – Suggest ways to build support for asset management program through outreach activities to familiarize and promote asset management practices
- **TAMP Implementation** – Provide recommendations for TAMP changes that improve consideration of life-cycle management techniques, enhance usefulness, and strengthen relationships and dependencies with MnSHIP

Asset Tiers

- Tier 1: Bridges, pavements, rest areas, radio towers, intelligent transportation systems (ITS), and signal systems
- Tier 2: ERS, culverts, high-mast tower lights, and frontage roads
- Tier 3: Deep stormwater tunnels, weigh stations, pavement markings, and roadway lighting
- Tier 4: Concrete noise walls, snow fences, trees, and storage sheds

Maintenance Approaches for Ancillary Assets

Approach	Definition
Condition-Driven Plus (Optimal)	Actions are taken proactively and reactively to optimize the asset life cycle through minimum life-cycle cost, maximum benefit, maximum life-cycle length, or similar
Condition-Driven	Actions are taken to manage the long-term performance of the asset or asset's impact on system performance
Cyclical-Driven Plus	The asset is inspected and maintained on a cyclical basis where condition data is required
Cyclical-Driven	The asset is maintained on a cyclical basis where condition data is not required
Reactive	Inventory is maintained , but there is no regular condition data collection and no maintenance performed to slow or address damage or deterioration
Minimal Maintenance	No inventory or condition data are collected or maintained. Maintenance is performed when assets are identified as having an unacceptable defect

Source: Minnesota DOT

Data Needs Determination

Question	Minimal Maintenance	Reactive	Cycle-Driven	Cycle-Driven Plus	Condition-Driven	Condition-Driven Plus
Does it require an asset inventory?	-	X	X	X	X	X
Does it require an asset maintenance cycle?	-	-	X	X	X	X
Does it require asset condition data?	-	-	-	X	X	X
Does it require long-term performance management?	-	-	-	-	X	X
Are there strategies to optimize its life cycle?	-	-	-	-	-	X

Source: Minnesota DOT

Recommendations

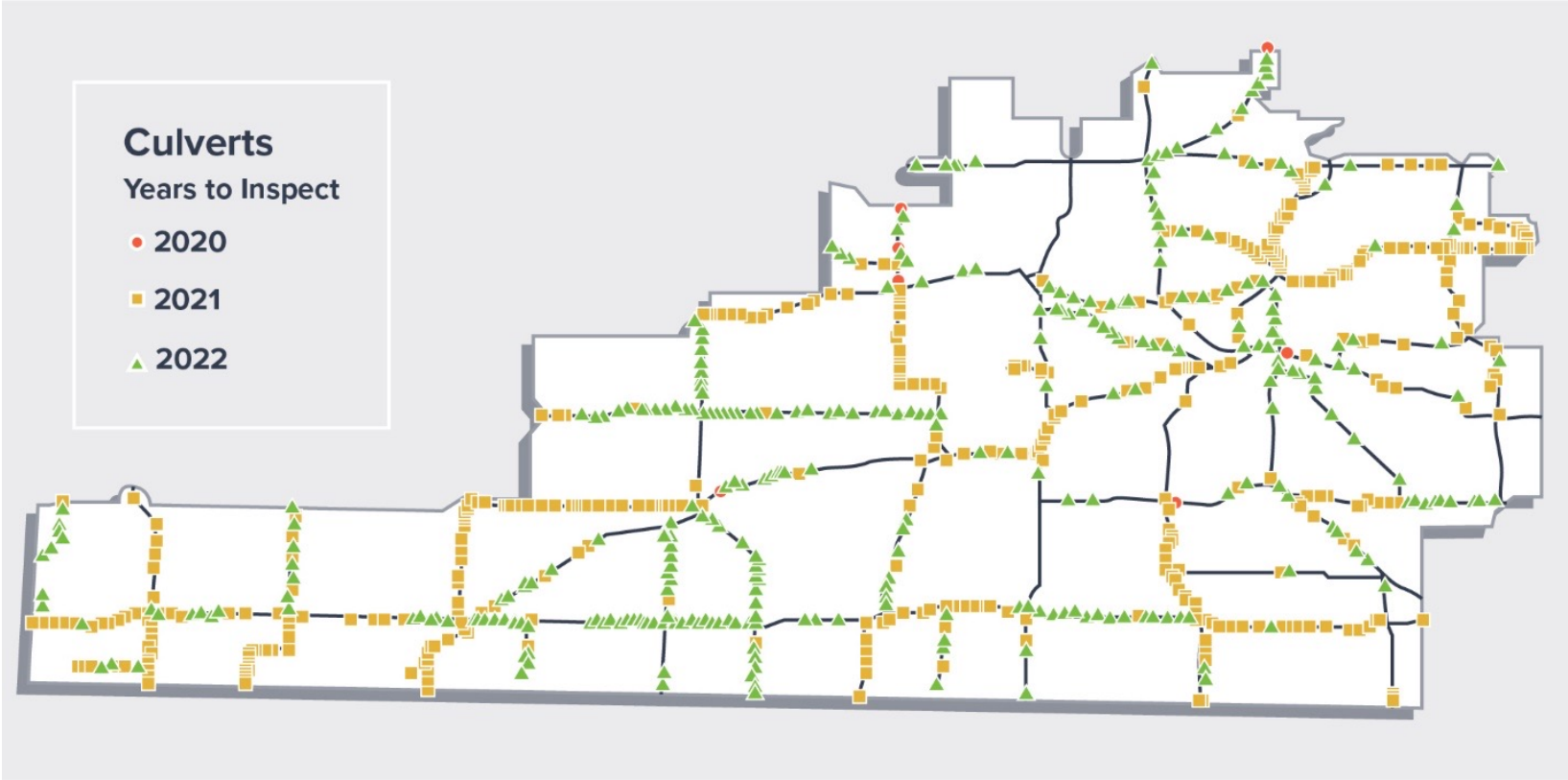
Recommendations – Working Groups

- Discontinue investment in data collection for mowing, embankments, curb and gutter, gravel shoulders, billboards, and roadway ditches
- Continue the current data collection processes for pavements and bridges, highway culverts and stormwater tunnels, weigh stations, and freeway management systems
- Develop inventories for signs and mainline culverts to reduce the risks associated with data gaps
- Address other identified data-related needs to support asset management as resources allow

Strategies Identified – Working Groups

- Asset attribution value exercise
- Communicating asset management roles and responsibilities
- Improved project scoping and work planning
 - Estimate repair costs for projects outside the Statewide Transportation Improvement Program (STIP)
 - Identify high-priority repairs
- Performance monitoring
- Damage restitution revenue
- Research and technology initiative

Culvert Inspection Plan



Source: Minnesota DOT



Outcomes & Next Steps

Risk Management Outcomes

- Reduces inefficiencies and uncertainties in planning
- Better understanding of operational needs
- Compliance with State legislative requirements
- Better understanding of asset risks
- Lower life-cycle costs
- Improved communication and collaboration within agency

Next Steps

- Continue outreach activities to build interest and engagement in asset management
- Monitor the status of the AMSIP recommendations
- Use the priorities established in the asset matrix and add additional ancillary assets to the TAMP
- Continue to advance the use of data to achieve the agency's vision
 - Demonstrate the applicability of Metro District's Action Plan in other districts
 - Initiate and monitor results for managing electrical services to generate information on preventive maintenance
 - Develop additional screening information with district assistance, such as a Resiliency Improvement Priority

Question & Answer Session

