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Think Forward

Transportation Infrastructure Right Sizing

presented to

Transportation Asset and Infrastructure Management (TAIM) Conference 2019

presented by

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October 29, 2019

What Is Right Sizing?

A process or set of

procedures, tools and techniques

used to pursue

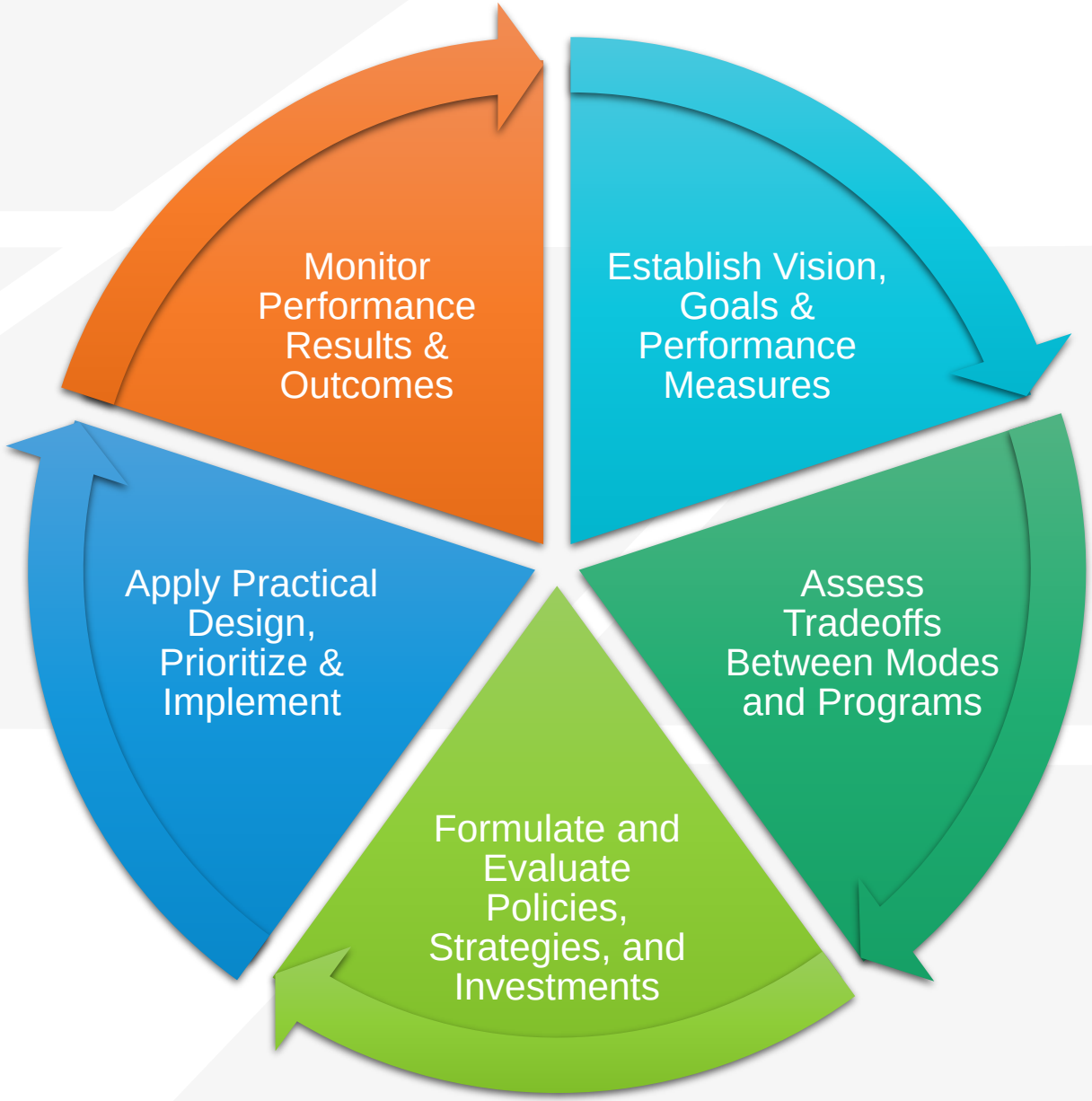
an optimal level of investment

based on functional requirements

Why Right Sizing?

- Aging infrastructure
- Unstable funding
- Changing performance expectations
- Changing agency missions
- Outdated programs
- Outdated analytical tools

Right Sizing Can Be Applied Throughout a DOT's Decision Making Structure



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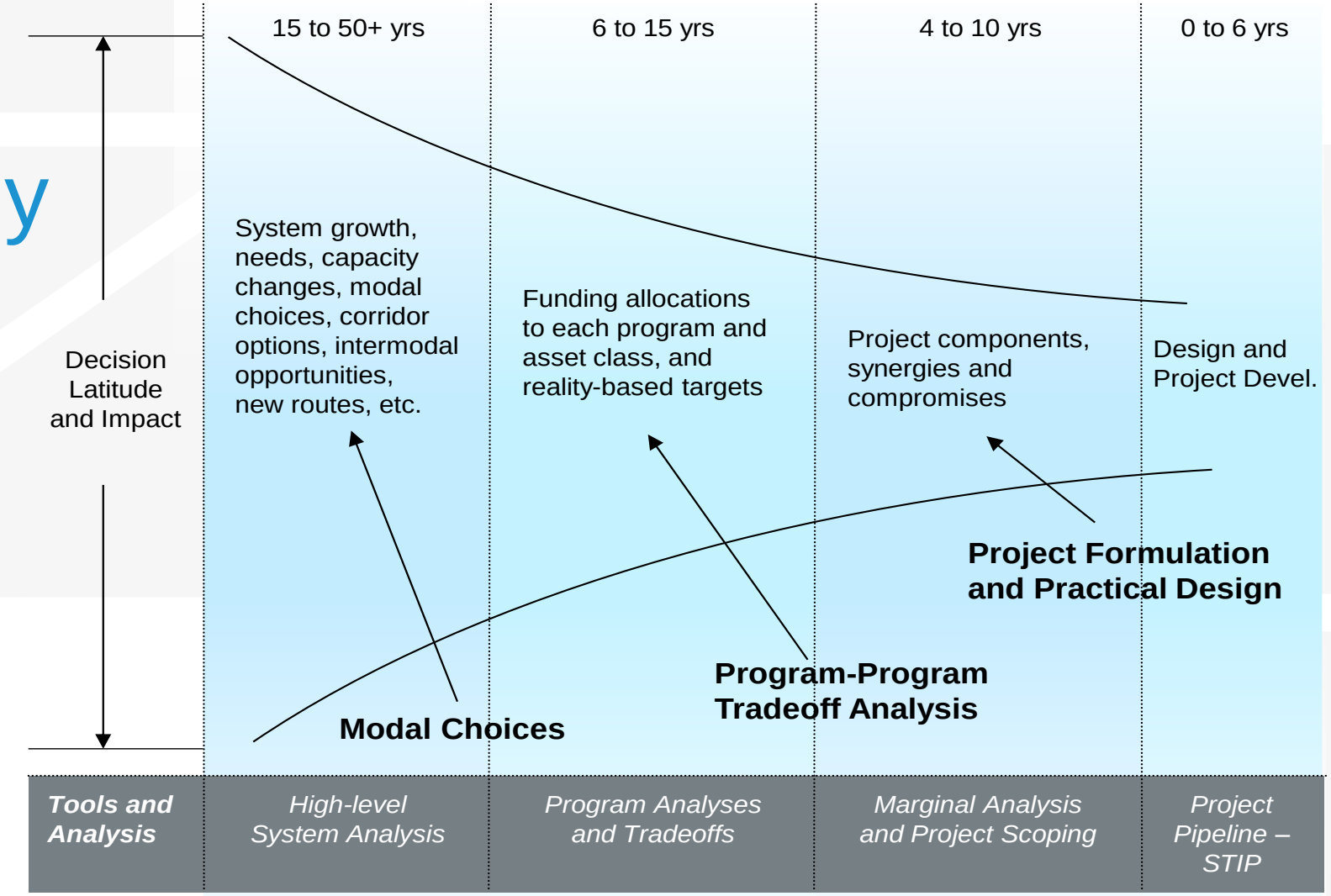
Right Sizing Decisions Apply at Different Timeframes



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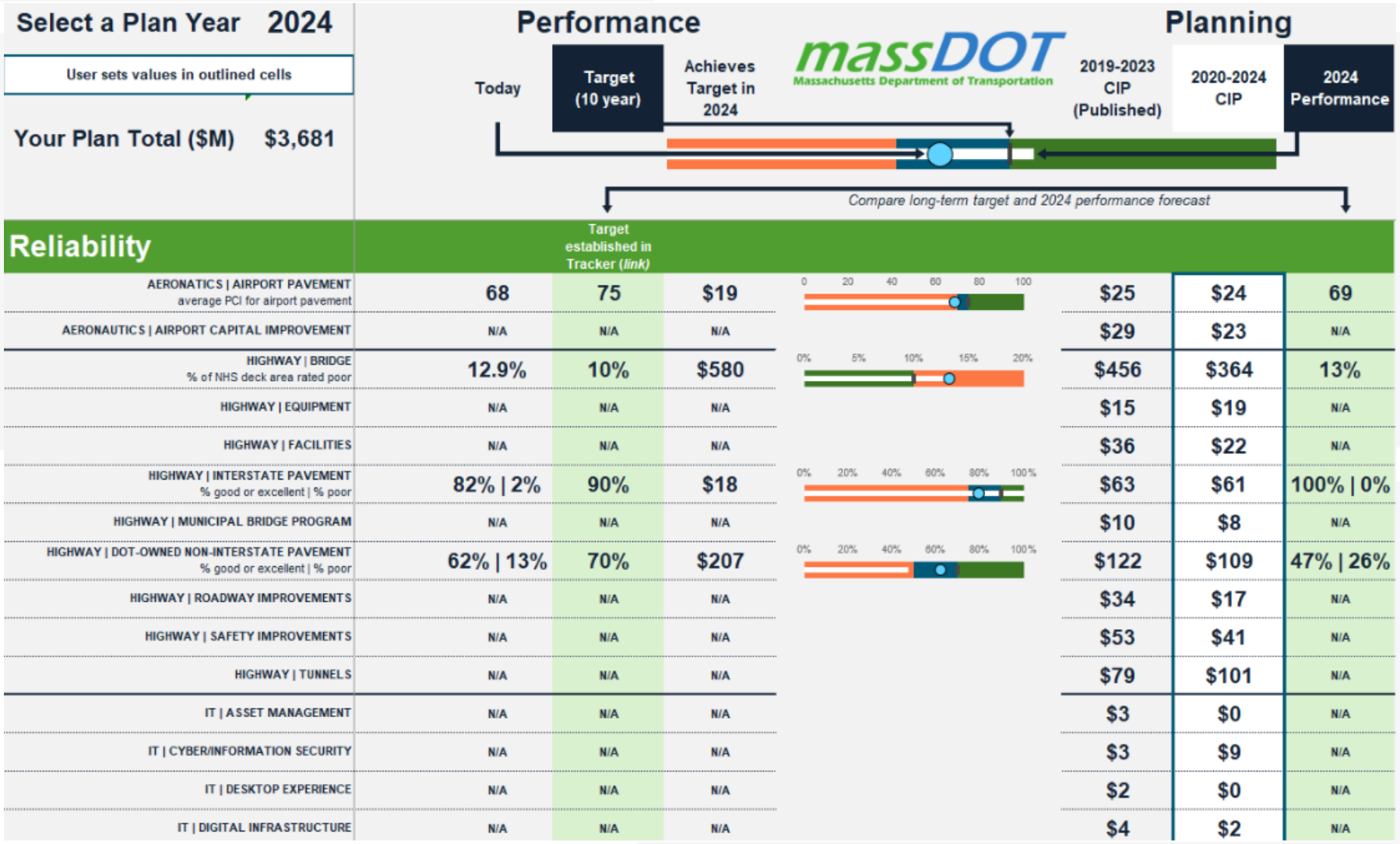
MassDOT's **Planning for Performance** Tool Assists in Capital Investment Program Right Sizing



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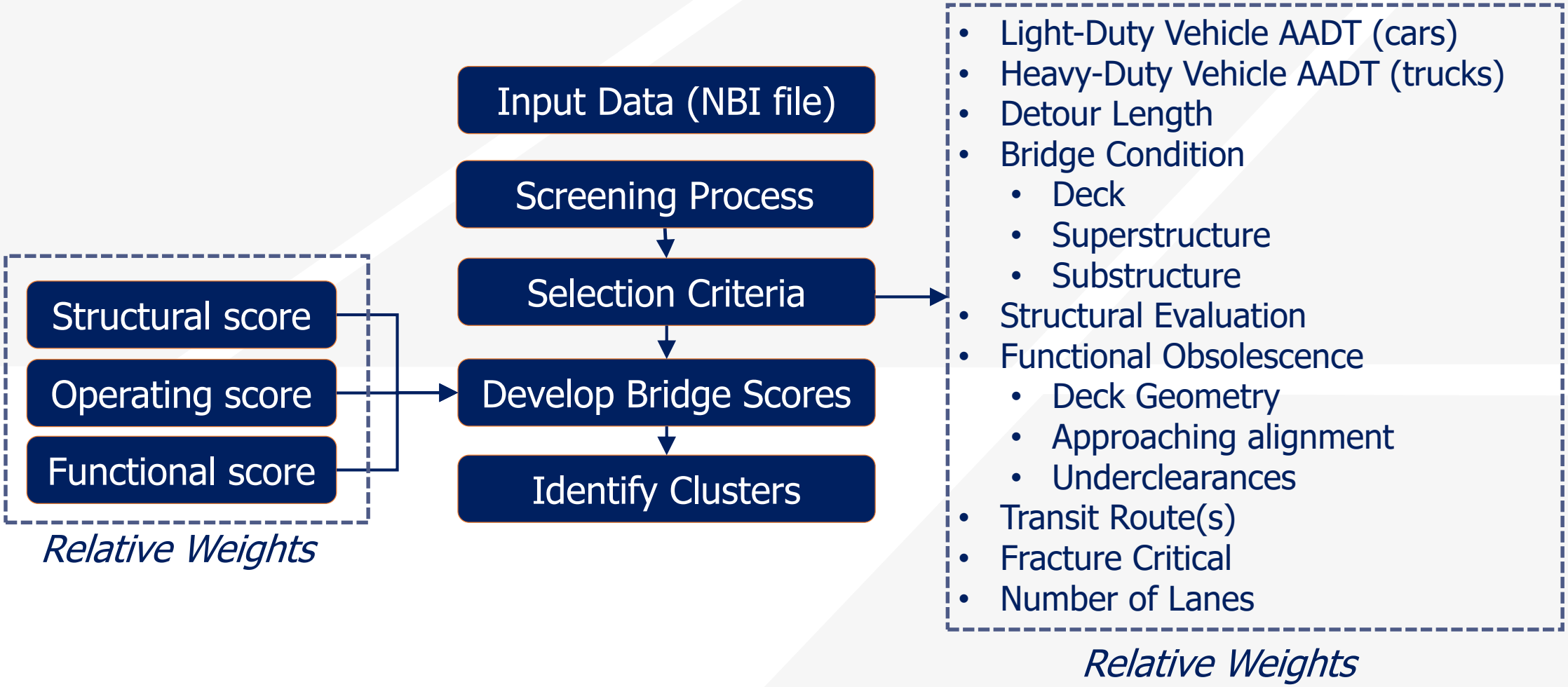
Genesee Transportation Council Identified Candidates for Bridge Decommissioning Using Network Scale Analysis



Many Agencies Use Performance-Based Practical Design to Right-Size Projects

- **Principle:** Overinvestment in one location effectively removes resources and availability for other potential projects and reduces overall system performance now, and in the long term
- **Practice:** Establish Project Purpose and Need, consider project and system goals (short-term and long-term), apply practical engineering and design approaches to optimize projected outcomes relative to goals and targets
  - Consider non-capital solutions
  - Use life cycle costs analysis (LCCA)
  - Reconsider assumption that a single asset must either be repaired as-is or replaced, reconsider timing, and look at the corridor/system

What Challenges Do We Face?

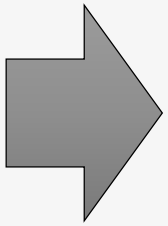
- Enabling input from stakeholders, and communication to them
- Developing processes that are:
  - Straightforward and usable by state transportation agencies
  - Applicable, replicable, and consistent across these agencies
- Allocating resources across transportation modes, programs, and asset classes, and geographically
- Improving project formulation and optimizing projects and strategies systemically, at a corridor scale, and for specific locations
- Diagnosing and correcting systemic defects (such as in design standards)
- Properly aligning outcomes with overall agency goals through active performance management

How Can Right-Sizing Address Risk?

- Some areas of the country have more transportation capacity than needed, and not enough resources to maintain
  - Bridge and highway decommissioning becoming more politically acceptable
- Lessons learned being integrated into planning resources and design manuals to inform project formulation and design
- There is uncertainty regarding implications of shared, electric, automated and connected vehicles on travel demand
  - Infrastructure requirements
  - Repurposing existing infrastructure
  - Economics (user costs and benefits)

NHDOT Has Investigated its Risks and Approaches to Manage/Reduce Them

RISK:
Pavement damaged by overweight vehicles



ASSET MANAGEMENT SOLUTION:
High-strength pavement used in acceleration/deceleration lanes with high freight traffic

Caltrans Has Begun to Assess Projects Based on Projected Impacts on Performance Goals

- Crash reduction benefits from pavement management treatments:

04-Alameda-Var 1481B 0414000357	In Alameda County, on Routes 80, 84, and 880 at various locations; also in Contra Costa County on Routes 24 and 680 at various locations. Install High Friction Surface Treatment (HFST) at spot locations to enhance wet pavement conditions.	1J780 2020-21	R/W: Const:	$10 $6,311	PA&ED: PS&E: R/W Sup: Con Sup:	$1,118 $1,274 $104 $1,534	18-19 19-20 19-20 21-22	PA&ED: R/W Cert: RTL: Begin Con:	10/1/2019 3/1/2021 6/1/2021 2/1/2022
			Subtotal:	$6,321		$4,030			
			Total Project Cost:			**$10,351**			

New

Program Code 201.015 Collision Severity Reduction
Performance Measure 24 Collision(s) reduced

Some States Are Integrating Risk with Asset OR Performance Management

Agency requirements for successful integration:

- Staff training, organization, and culture (**people**)
- Procedures and documentation (**processes**)
- Data and tools supporting integration (**technologies**)

Key Takeaways from NCHRP 08-113

- Personnel & Skills:
  - Multi-disciplinary staff and cross-silo cooperation
  - Modern technology, data, statistical systems and practices
  - Knowledge transfer between consultants and agency staff
- Policy & Agency Structure:
  - Integration champion
  - Modified organizational structure and documentation to support integration
- Resource Requirements:
  - Combined budgets for integrated management areas
  - Flexible program planning to account for funding variability

Key Takeaways from NCHRP 08-113

- Data Needs:
  - Institutionalized data governance
  - Visualization and interactive dashboards to empower leadership to engage with technical staff
  - Intentional acquisition, management of high quality asset, financial data
  - Continual improvement of data, sophisticated modeling to account for missing data and uncertainty

THANK YOU

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