Performance Management

An Optimized Investment Portfolio

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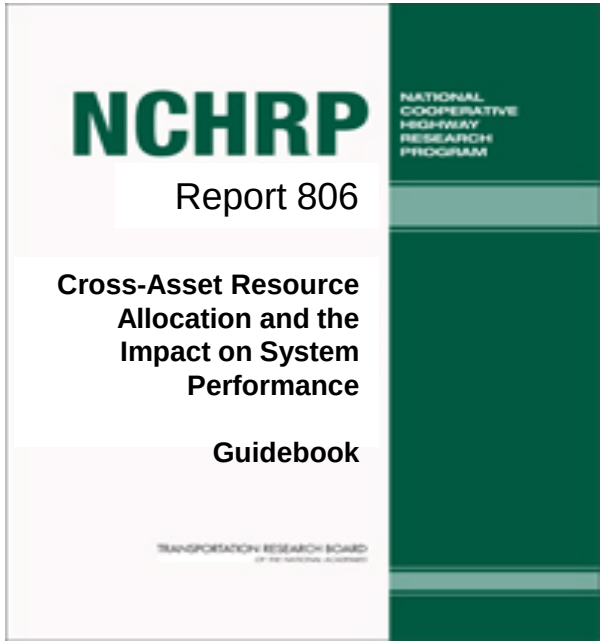

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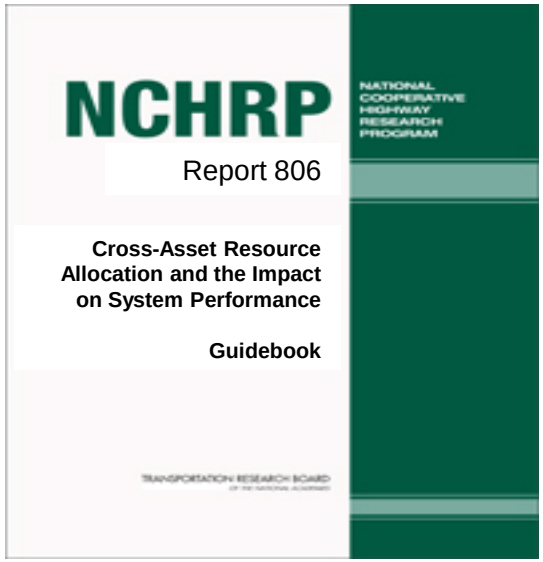
Today

- Current State-of-the-Practice
- Rethinking Resource Allocation
- Performance-based Planning & Programming Framework
- Example Demonstration
- Discussion

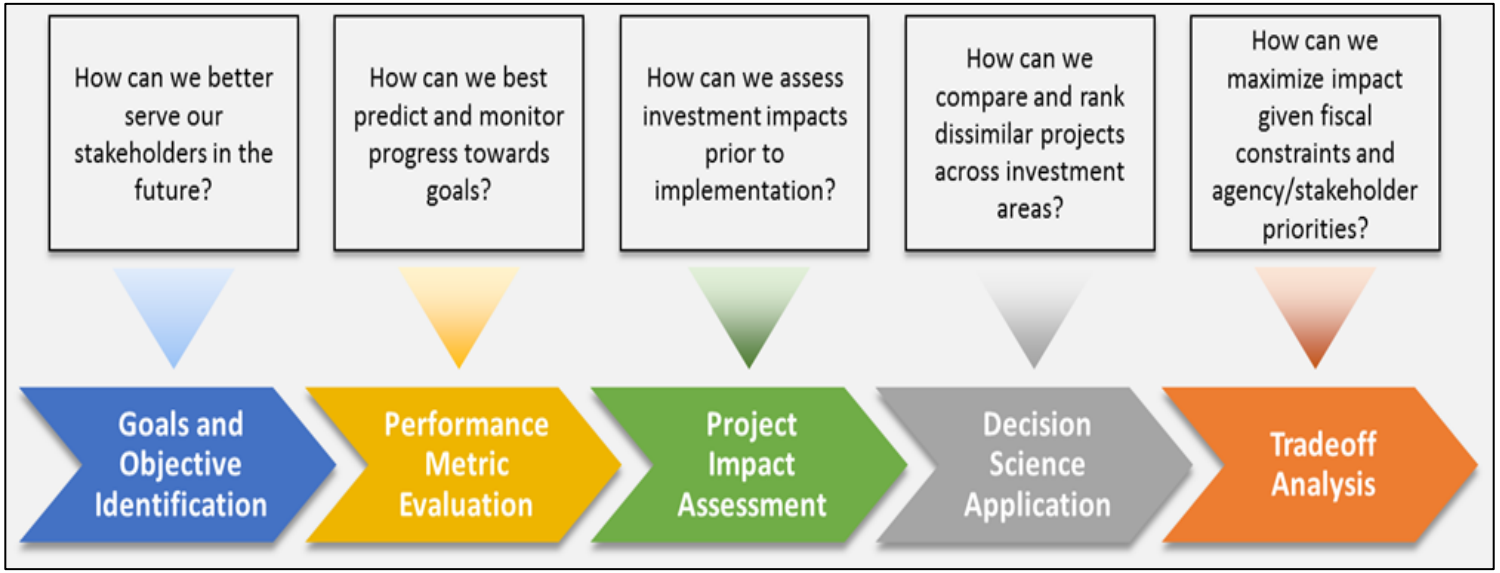
Current State-of-the-Practice

- Oftentimes, allocations based on:
  - historical precedence or
  - formula-driven based on inventory size and % requests
- Typically for statewide programming:
  - Regions submit rank-ordered project list,
  - Central Office validates and use largely manual-driven processes to finalize project selection based on equity and funding eligibility
- Trends have shown:
  - States moving towards performance-based principles but focus more on reporting than predicting
  - Increased legislative pressure and demands for transparency

Rethinking Resource Allocation

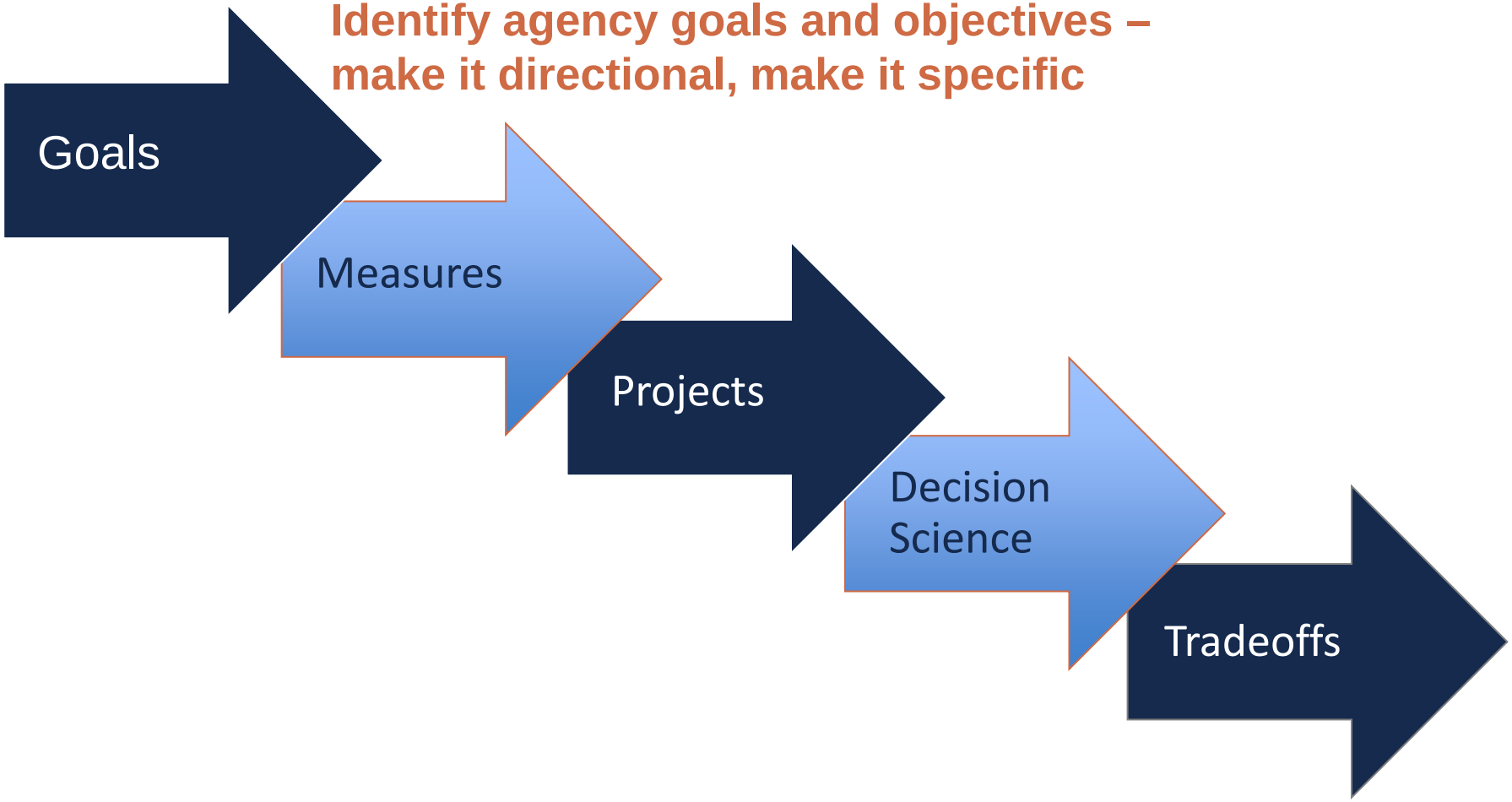


- Links planning to programming
- Recognizes cross-asset impacts
- Flexible to support any criteria
- Accommodates management systems
- Supports target setting

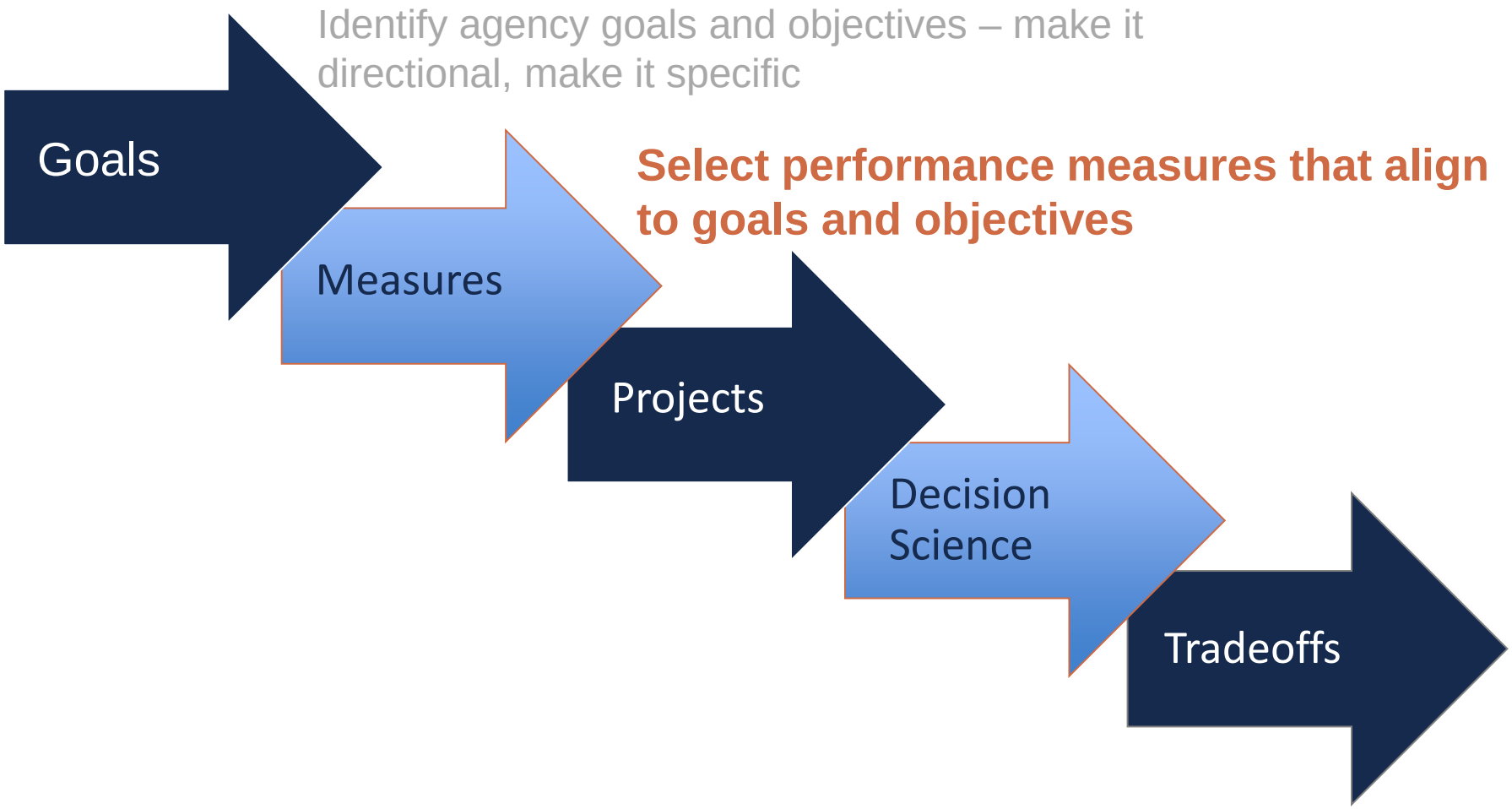


Rethinking Resource Allocation

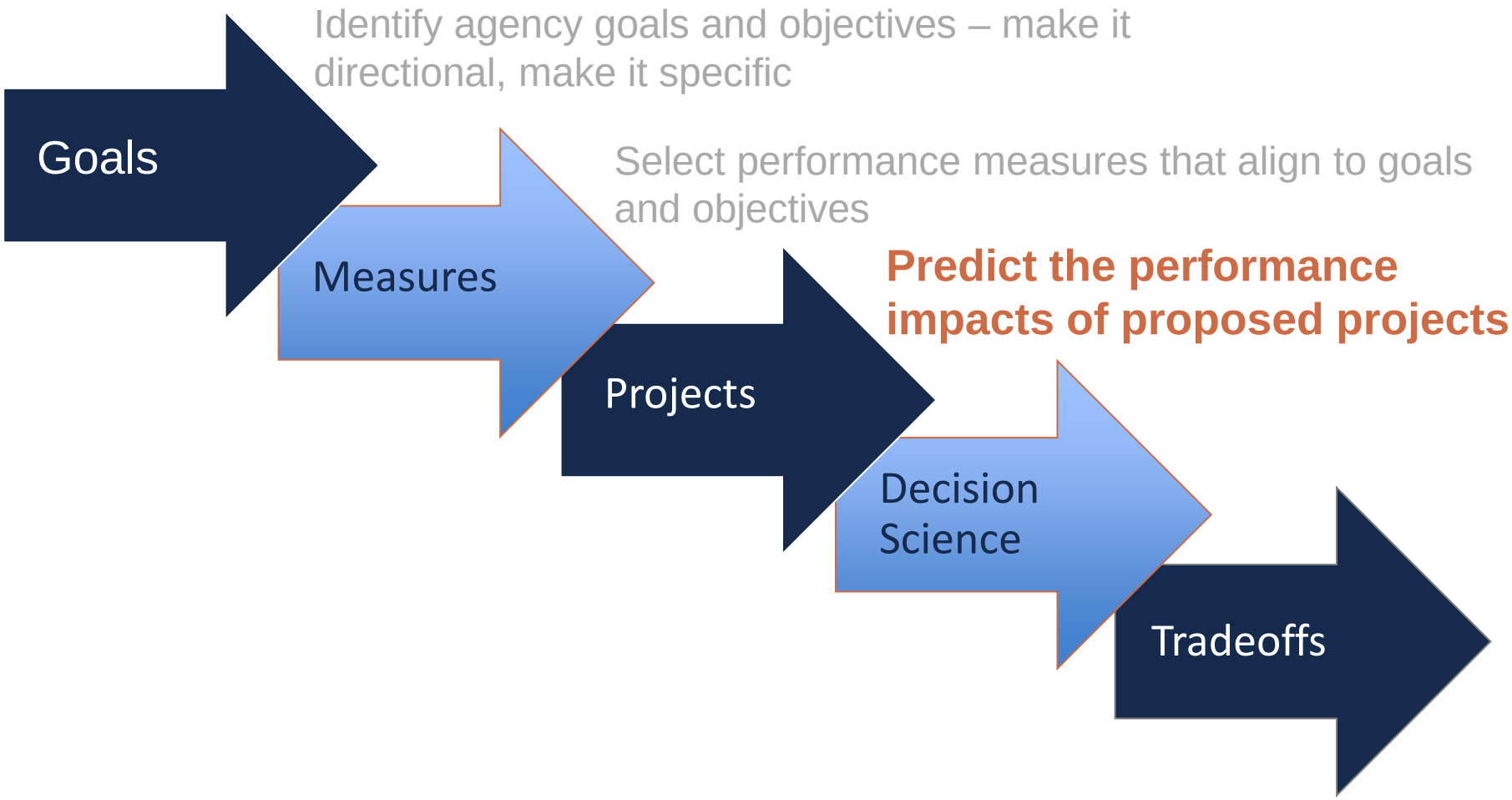
Identify agency goals and objectives – make it directional, make it specific



Rethinking Resource Allocation



Rethinking Resource Allocation



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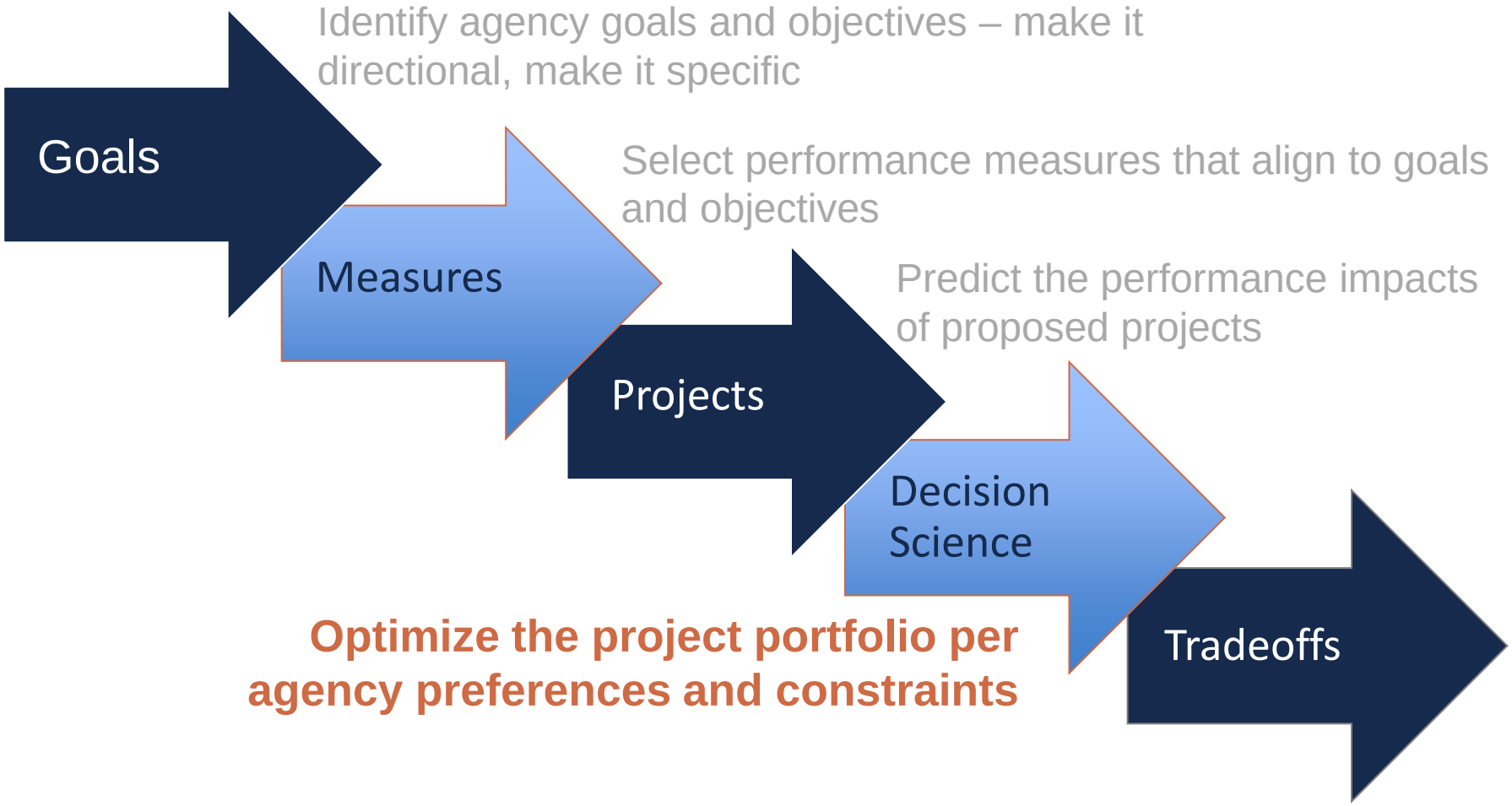
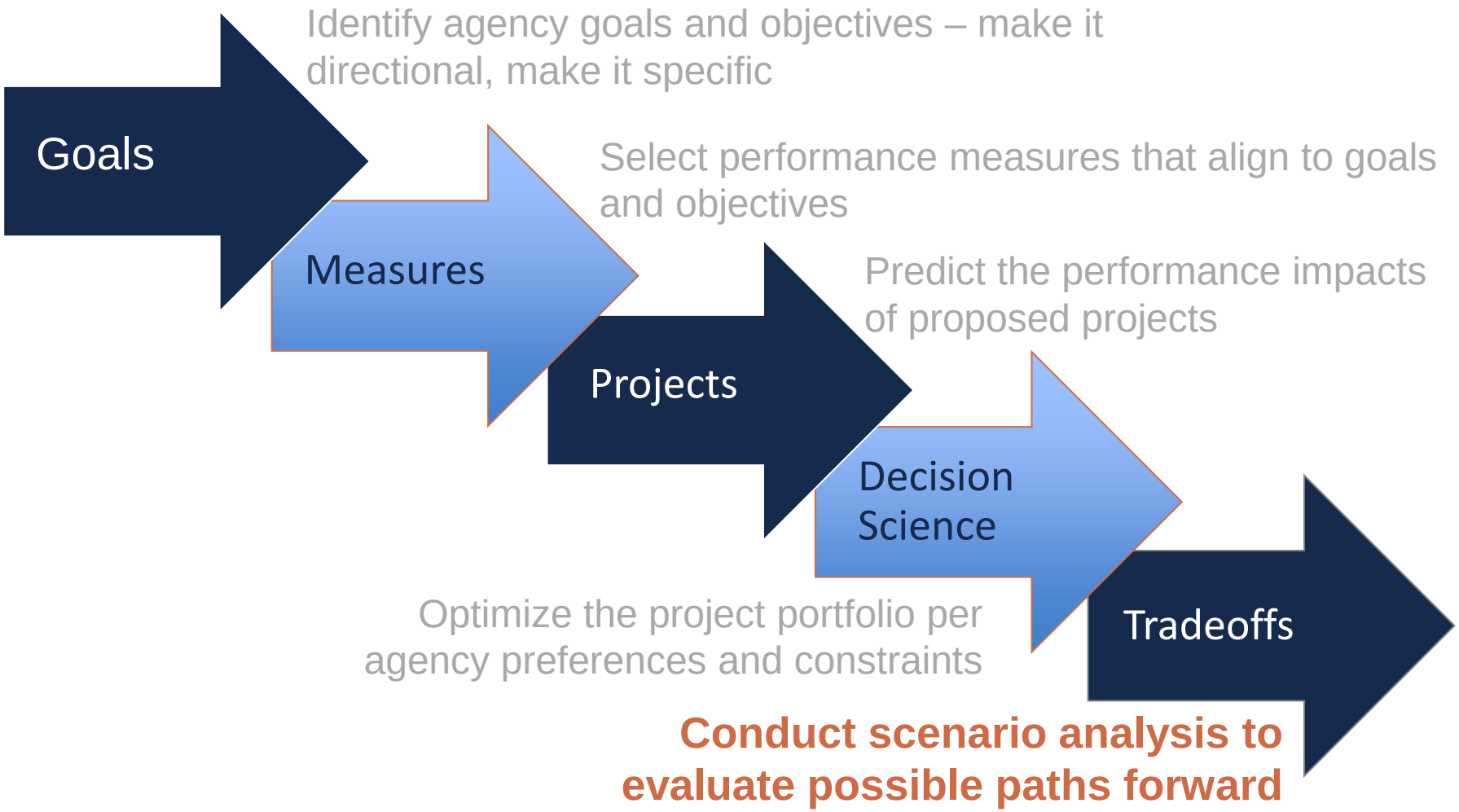


Rethinking Resource Allocation

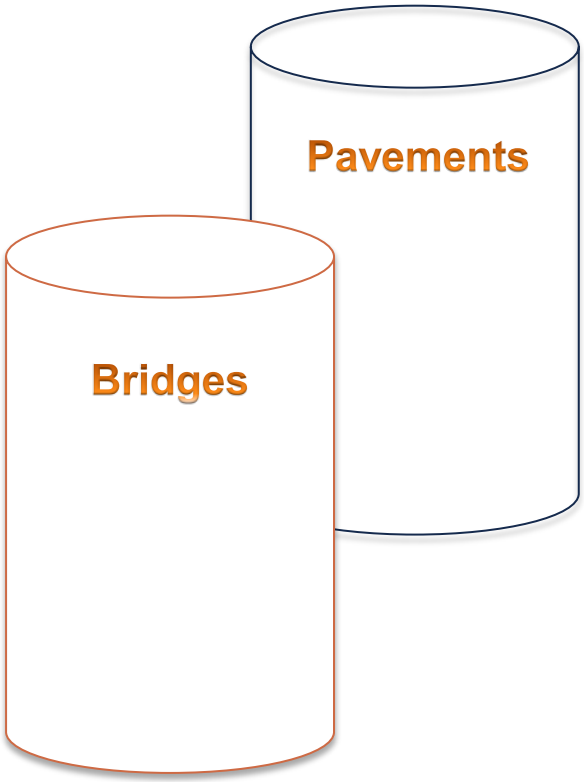


Applying the Framework

Move beyond the siloes…

If there were one more dollar to spend, where should it go?

- Put project value above historic programmatic allocation
- Allow performance to drive project selection
- Select the next best project that optimizes resources while considering project schedules, dependencies, and constraints
- Make your case for increased funding flexibility



Applying the Framework

Goals

The agency's Strategic Plan and/or LRTP can provide goals for project selection.

However, create a specific "decision goal" to ensure the decision problem is consistently understood across all stakeholders, e.g.,:

Develop TAMP using MAP-21 performance criteria to meet federally-mandated targets

Recommend freight projects using criteria collected in state freight plan development

Develop 5- & 10-year capital program priorities using strategic plan goals and objectives

Applying the Framework

Measures

MAP-21 rulemaking identifies NHS measures; additional state and local measures and criteria should be included to round-out a performance-based process.

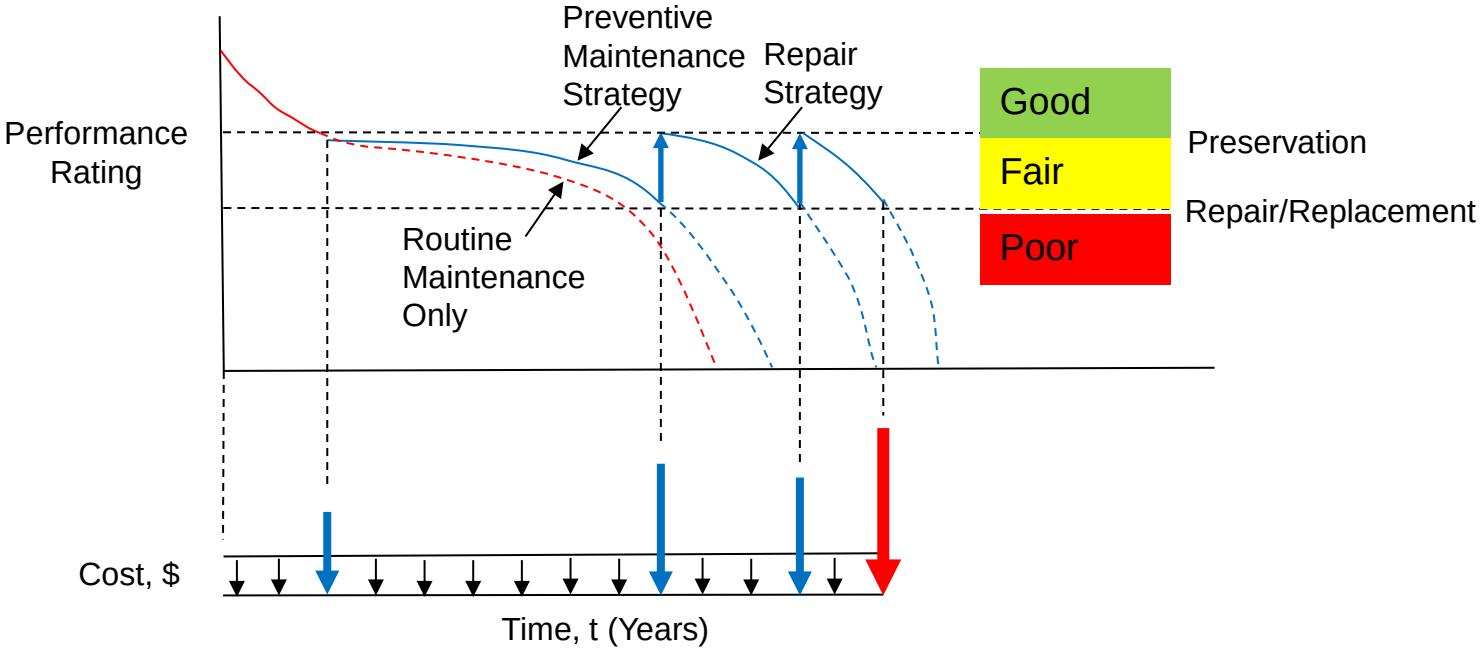
- Portfolio Goal: Prioritize Projects, Optimize Capital Assets Program, and Evaluate Tradeoffs
  - Safety
    - Substantive Safety
      - Reduction in Fatal and Serious Injury Crashes
      - Reduction in Fatal and Serious Crash Rates
      - Societal Cost Savings
    - Nominal Safety
      - Impact on Geohazard Risk
      - Design Element Sufficiency
  - Preservation
    - Bridge
      - Impact on Structural State-of-Repair (Bridge Health Index)
      - Impact on Functional State-of-Repair (Bridge NBI Deck Geometry Rating)
      - Deck Area Improved
    - Pavement
      - Impact on Structural State-of-Repair (Pavement Condition Index)
      - Impact of Functional State of Repair (Pavement IRI)
  - Mobility
    - Congestion Relief
      - Annual Hours of Delay Savings
      - Change in Reliability Index
      - Reduction in Criteria Pollutant Emissions
    - Connectivity and Accessibility
      - Intermodal Facility Connectors
      - Increase in Access to Employment
      - Increase in Access for Environmental Justice Populations
  - System Criticality
    - Network Classification
      - Highway Network
      - Freight Network
    - System Usage
      - AADT
      - % Trucks
    - Regional Importance
      - Impact on Economic Development Plans
      - District Priority Score

Applying the Framework

Projects

What is a project? And what will it buy us?

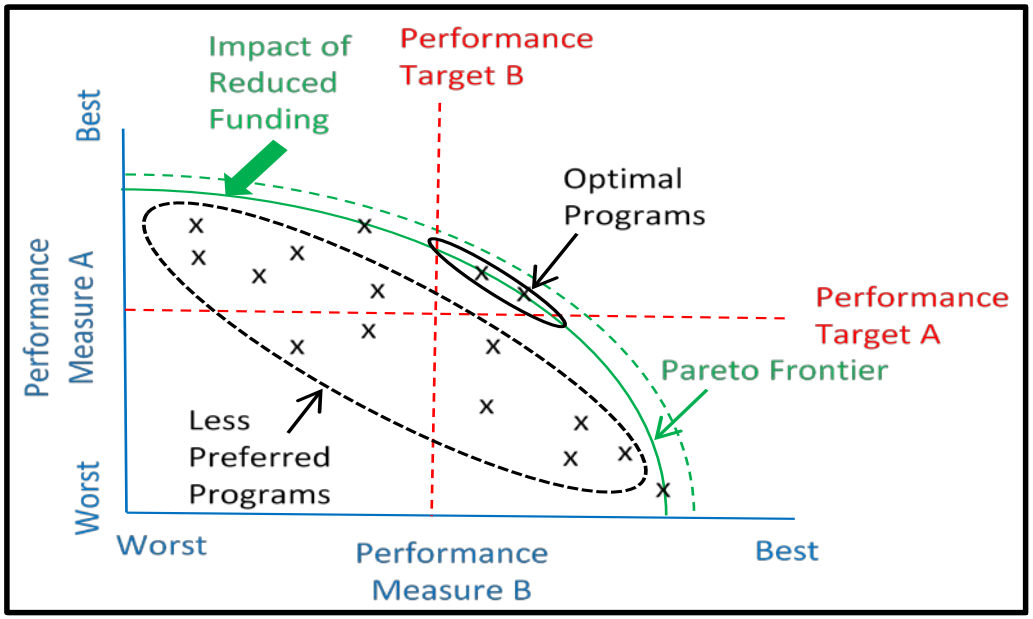
Agencies can leverage management systems with supplemental expert judgments to capture the true value of a project



Applying the Framework

Decision Science

Multiple levels of decision making:
1) Within an investment area



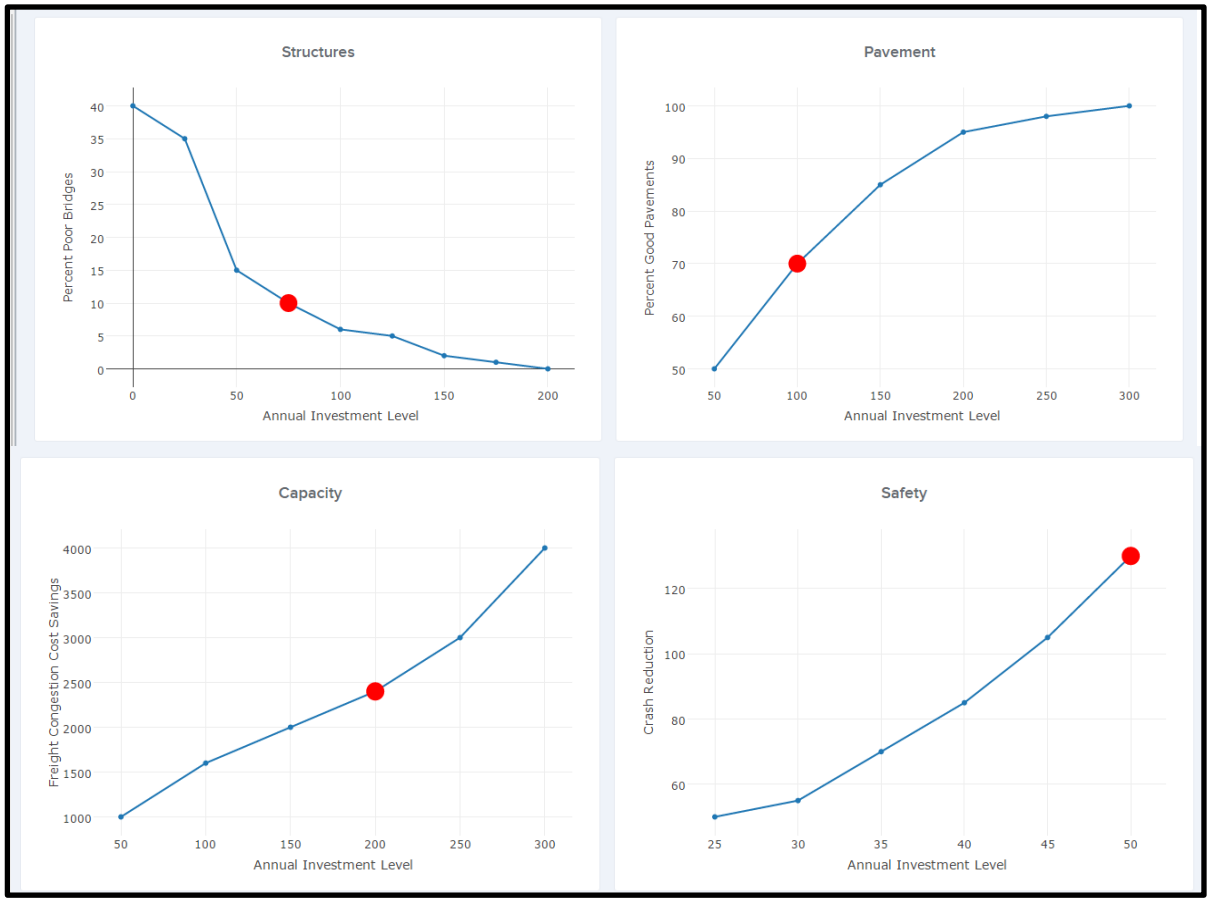
Where do we start?

- Calculate project impacts across all performance areas
- Assign relative importance of performance metrics
- Compare dissimilar performance metrics on a level-playing field
- Score and prioritize projects
- Optimize project selection and evaluate tradeoffs

Applying the Framework

Decision Science

Multiple levels of decision making:
2) Across investment areas



Where do we start?

- Run management systems to establish performance vs. investment curves
- Use priorities to guide where to fall on each curve
- Optimal project sets depend on approximate budget by silo

Applying the Framework

Decision Science

Weight

- Elicits priorities through structured, repeatable, and collaborative pairwise comparative process
- Quantifies subjective opinions for various groupings of staff and facilitates stakeholder discussions
- Particularly helpful when dealing with multiple performance criteria

With respect to **Decision Goal: Optimize Program Performance by St...** , which is more important?

Strategically Expand Service *or* **Maintain System Reliability**

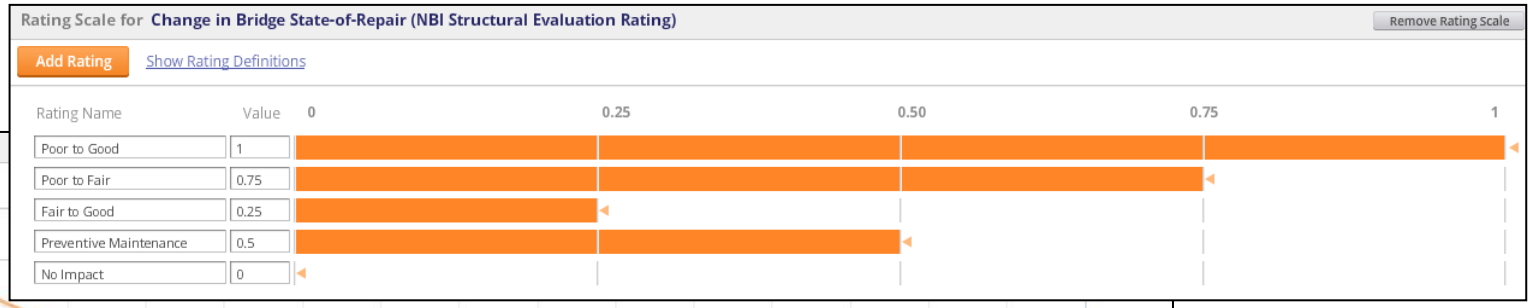
	Extreme		Very Strong		Strong		Moderate		Equal		Moderate		Strong		Very Strong		Extreme
Group Avg	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9
Board Membe...	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9
Board Membe...	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9
Chief Engineer	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9
Maintenance ...	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9
Mayor's Coun...	9	8	7	6	5	**4**	3	2	1	2	3	4	5	6	7	8	9
Mayor's Coun...	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9
Public Stakeh...	9	8	7	6	5	**4**	3	2	1	2	3	4	5	6	7	8	9
Public Stakeh...	9	8	7	6	5	4	3	2	1	2	3	4	5	6	**7**	8	9
TransLink Chair	9	8	7	6	5	**4**	3	2	1	2	3	4	5	6	7	8	9

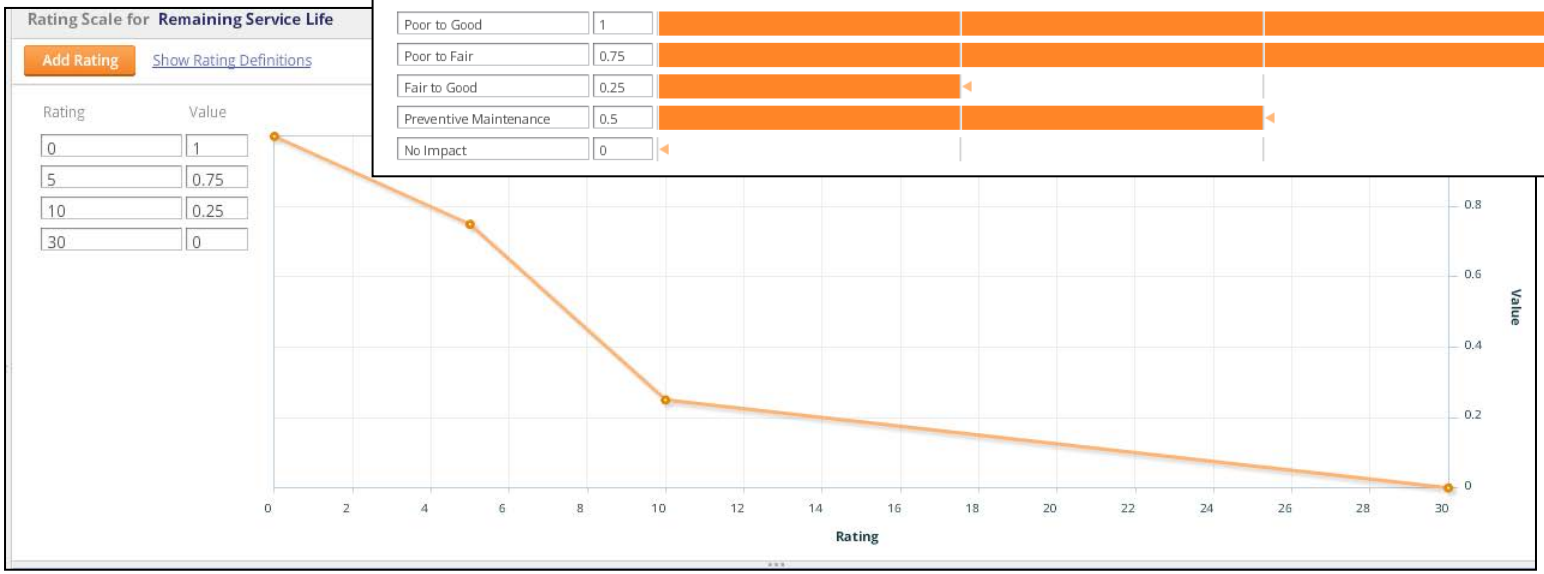
Applying the Framework

Decision Science

Scale

- Applies utility / value scaling to project attribute or impact
- Can accommodate data-driven or subjective ratings, as well as monetization on a normative 0 to 1 scale
- Supports varying risk tolerances and outcome preferences
- Highlights marginal rates of return



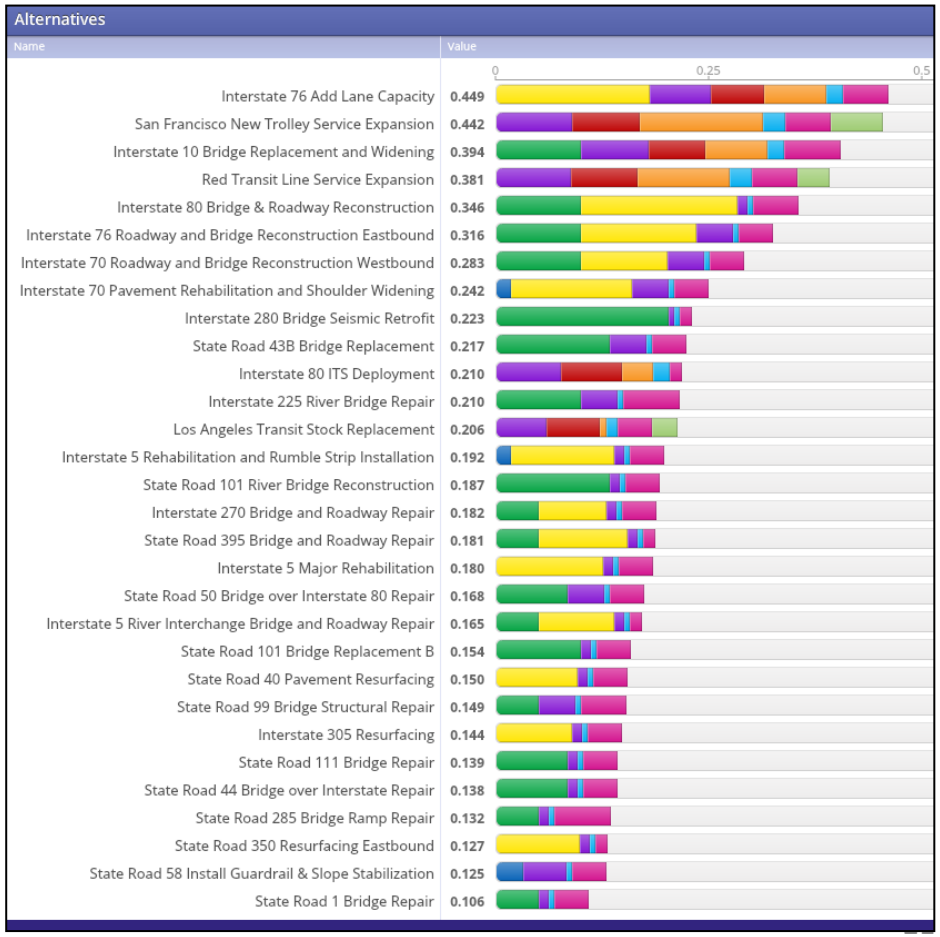


Applying the Framework

Decision Science

Score

Combine weights with project ratings to develop a prioritized list and view impacts of different stakeholder perspectives



Applying the Framework

Decision Science

Optimize

Maximize Portfolio Score subject to constraints

- Consider resource constraints by time period and category, performance targets, project dependencies, geographic equity, project readiness, and financing strategies

Funded 19 — 65,030,000.00

Alternative	Value	Funded
Interstate 80 Corridor Reconstruction	0.642	22,500,000.00
Interstate 76 Managed Lanes	0.363	6,100,000.00
Interstate 5 Widening and Frontage Road	0.304	9,000,000.00
Interstate 70 Pavement Rehabilitation and	0.281	3,225,000.00
Interstate 70 Safety Enhancements	0.279	1,000,000.00
Interstate 80 ITS Deployment at Interchan	0.269	500,000.00
Interchange Construction Connecting Inte	0.230	13,000,000.00
US Route 40 Drainage improvements with	0.213	1,000,000.00
Interstate 280 Bridge Seismic Retrofit	0.204	4,500,000.00
Interstate 5 Major Rehabilitation	0.195	875,000.00
ATMS Implementation approaching CBD c	0.183	750,000.00
State Route 285 Bridge Drainage System	0.143	300,000.00

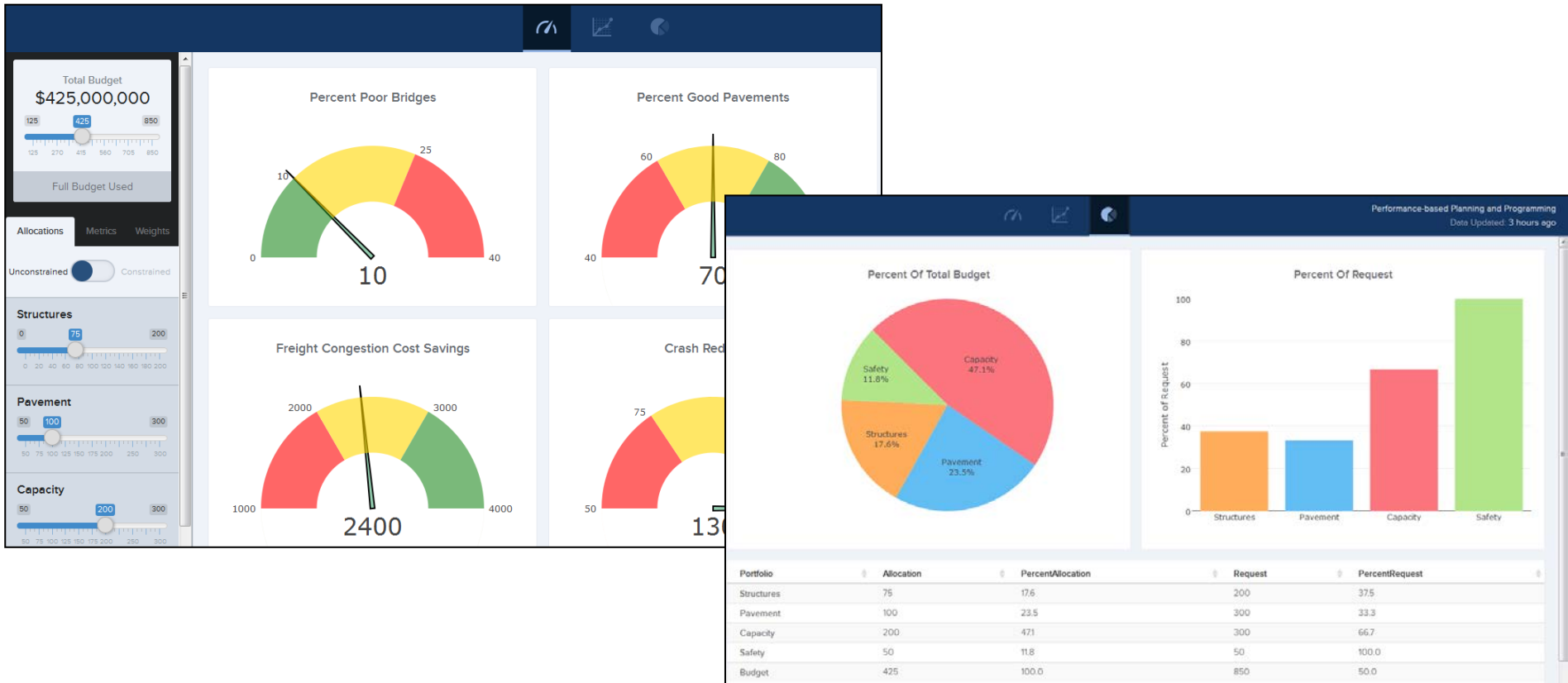
Not Funded 11 — 89,600,000.00

Alternative	Value	Requested
Interstate 76 Add Lane Capacity	0.462	24,000,000.00
Interstate 305 Median Barrier Constructio	0.338	1,200,000.00
Interstate 10 Bridge Replacement and Wid	0.271	8,000,000.00
Jamestown Beltway Construction with Bus	0.221	20,000,000.00
State Route 35 Roadway Widening and Bi	0.200	8,950,000.00
Construct Two-way Direct Connector betw	0.200	7,500,000.00
State Route 60 TWLTL Construction	0.169	4,000,000.00
US Route 101 River Bridge Reconstruction	0.159	8,000,000.00
State Route 43B Bridge Replacement	0.133	1,950,000.00
State Route 50 Deck Replacement and Br	0.129	3,500,000.00
Construct Park and Ride Facility along Riv	0.107	2,500,000.00

Applying the Framework

Tradeoffs

- Understand policy implications:
  - **What if** I had to achieve these targets?
  - **What if** I invest more or less in a region?
  - **What if** I shift money from one category to another?
  - **What if** I was not mandated to fund this way?
  - **What if** my priorities change?



Overcoming Challenges

- Start with a program or sub-program. For example, apply the framework to support the STIP, TAMP, SLRTP, Freight Plan, Corridor Study, etc.
- Use the long-range or strategic plan as guiding goals and objectives, and drill down if/when appropriate.
- Incorporate asset management data at the project-level (most agencies have substantial bridge and pavement data).
- Build-in considerations for must-do and political “pet” projects, as well as any sub-area equity concerns.
- Track effectiveness of programs, learn, and improve.

Example Implementation Strategy

Demonstration

Thank You

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