Straight to Recording for All:
Resource Allocation among Programs of Work
NCHRP Research Report 510: Resource Allocation of Available Funding to Programs of Work

NCHRP Project 20-05
NCHRP is a State-Driven Program

- Sponsored by individual state DOTs who
  - Suggest research of national interest
  - Serve on oversight panels that guide the research.

- Administered by TRB in cooperation with the Federal Highway Administration.
Practical, ready-to-use results

- Applied research aimed at state DOT practitioners
- Often become AASHTO standards, specifications, guides, syntheses
- Can be applied in planning, design, construction, operations, maintenance, safety, environment
Project purpose

Topic 47-10: Resource Allocation of Available Funding to Programs of Work

• Understanding trade-offs between programs of work and how states make resources allocation decisions
Synthesis components

- Review of literature and practice
- Survey of the state of the practice
- Case examples of resource allocation
- Conclusions
Panel members

- Brad Allen, Applied Pavement Technology, Inc.
- Alix Bockelman, Bay Area Metro Center
- Michael Lowry, Univ. of Idaho - NIATT
- Kathleen Mayell, City of Minneapolis Public Works
- Lance Neumann, Cambridge Systematics
- Monica Starnes, TRB
- David Wasserman, NCDOT
- Joseph Burdas, Federal Highway Administration
- Jill Stark, Federal Highway Administration
Today’s Speakers

Presenters

• Chandler Duncan, Economic Development Research Group, Inc.

• Kyle Schroeckenthaler, Economic Development Research Group, Inc.

Moderator

• Kathleen Mayell, City of Minneapolis
Resource Allocation among Programs of Work for Transportation Agencies

Chandler Duncan & Kyle Schroeckenthaler
EDR Group
• Introductions
• Overview of Learning Objectives
• Background on NCHRP Synthesis 510
• Findings on Resource Allocation Practices
• Ongoing Research
Understanding the role of the following topics in transportation agency resource allocation processes:

- “Bottom-up” vs “Top-down” approaches
- Principles of balance
- Models, data, and decision support technology
- Responses to political and stakeholder scrutiny
About NCHRP Synthesis 510

• 2015-2016 NCHRP Synthesis on how states allocate revenue among *programs* of work

• Comprehensive literature review on evolution of resource allocation and current state of research

• Detailed case studies for four states

• Survey of practices among state departments of transportation (42/51 responses)
What programs do agencies cover with a resource allocation strategy?

- Highway Preservation/Rehabilitation: 97%
- Highway Expansion: 97%
- Bridge Expansion: 87%
- Highway Safety: 78%
- Highway Ops and Routine Maint: 89%
- Ports/Waterways: 70%
- Aviation: 14%
- Transit Capital: 32%
- Transit Operations: 41%
- Bicycle & Pedestrian: 30%
- Other - Write in: 57%
- Other - Write in: 24%
Why does your agency use the resource allocation strategy that it does?

- Be objective and consistent over time: 65%
- Meet each program's minimum needs: 78%
- Meet long-term performance targets: 87%
- Be transparency in investment decisions: 68%
- Satisfy requirements of state statutes: 51%
- Satisfy executive policy objects: 51%
There are several different ways that agencies can develop to funding levels for programs of work.

Many agencies’ process falls between these two approaches.
Examples

Bottom-Up

- Idaho & Oregon
  - Typically bottom-up approaches have a limited number of programs
  - System needs drive funding decisions and the size of programs

Top-down

- Florida & Massachusetts
  - Florida program allocations are significantly controlled by legislative requirements
  - Massachusetts program allocations are generally determined based on performance targets and estimated impacts
• Agencies work with a large number of stakeholders, internal and external
• Allocation processes need to balance many dimensions to produce beneficial outcomes

Aspects to Balance

Dimensions of Balance
• Geographic
• Modal
• Preservation and Improvement
• Ease of Communication and Complexity
• Discretion and Consistency
• Data, Quantitative and Qualitative Factors
- Oregon modal balance
  - Off-the-top programs
  - Enhance program
  - ConnectOregon program
- Multi-round scoring processes
- Alternative funding sources
- Engineer discretion points

- Idaho’s more recent allocations have reduced strict geographic requirements
- Recent increase in discretion
• Tools help address defensibility and affect balance by supporting:
  • Consistency
  • Objectivity
  • Transparency

• However, they may:
  • Increase complexity
  • Leave less room for discretion
  • Limit qualitative inputs

• Successful agencies use tools to support their processes rather than building processes around their tools
What factors are very important to determining how resources are allocated?
What factors could help your agency be more confident in your resource allocation strategy?
• Florida’s Strategic Intermodal System’s Strategic Investment Tool
• Development started in 2001 out of a plan

<table>
<thead>
<tr>
<th>FTP Goal</th>
<th>Number of Measures</th>
<th>Total Points</th>
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<tbody>
<tr>
<td>Safety &amp; Security</td>
<td>5</td>
<td>20</td>
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<tr>
<td>Maintenance &amp; Operations</td>
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<td>20</td>
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<tr>
<td>Mobility &amp; Connectivity</td>
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<td>20</td>
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<td>Economic Competitiveness</td>
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<td>20</td>
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<td>Livable Communities</td>
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<td>20</td>
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<td>Environmental Stewardship</td>
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<td>20</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
<td><strong>120</strong></td>
</tr>
</tbody>
</table>

Source: Sirianni 2015

• Massachusetts Planning for Performance Tool
• Allows for scenario testing allocations between programs and outcomes

Source: Cambridge Systematics, Inc. 2016
More Massachusetts

Spreadsheet interface incorporates the investment response functions and allows visual and analytic assessment of progress towards targets.

<table>
<thead>
<tr>
<th>Program</th>
<th>Associated Metric(s)</th>
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<tbody>
<tr>
<td>Non-Tolled Interstate Pavement</td>
<td>PSI: % Good/Excel; PSI: % Poor</td>
</tr>
<tr>
<td>DOT-Owned Non-Int. Pavement</td>
<td>PSI: % Good/Excel; PSI: % Poor</td>
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<tr>
<td>Multi-Use Path</td>
<td>New facility-miles</td>
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<tr>
<td>Bridge</td>
<td># of SD bridges</td>
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<tr>
<td>Highway Capacity</td>
<td>Hrs./1000 VMT; TTI_{80}</td>
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<td>Intersection Safety</td>
<td>EPDO crashes prev.</td>
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<table>
<thead>
<tr>
<th>Rail and Transit Division</th>
<th>Current Spending</th>
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<tbody>
<tr>
<td>MBTA BRIDGES % SGR</td>
<td>$314 65% 75%</td>
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<tr>
<td>MBTA ELEVATORS/ESCALATORS % SGR</td>
<td>$19 60% 85%</td>
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<tr>
<td>MBTA ACCESSIBILITY % of stations AGA Compliant</td>
<td>$38 74% 88%</td>
</tr>
<tr>
<td>OVERALL MBTA ROLLING STOCK (Derived from lines 13-17)</td>
<td>$189 60% 50%</td>
</tr>
</tbody>
</table>
• Most agencies at least sometimes need to justify their allocation decisions beyond a official level.

• This may be political actors or stakeholders and the public

• This scrutiny can turn out positively or negatively for agencies.

Q10. How much support or scrutiny does your allocation strategy get from stakeholders, elected officials and other outside the agency?
Examples

• Idaho audit of 2010-2012 transportation outlays
• Reviewed balance issues
  • Life-cycle cost
  • System efficiency
• Audit recommendations allow ITD to make changes with the support of the Transportation Board and Legislature

• Florida legislative requirements
• DOT is active in legislative process
• Many layers of planning and implementation partners
• Frameworks like the SIS help the agency defend allocation decisions
Ongoing Research

• Right-sizing programs
• Relationship to benchmarking/ex-poste evaluation
• Cross-asset allocation
• Communication strategies
• State objectives vs federal performance targets
Thank You!

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