Bang for the Buck?
Following the Money from Transportation Decisions to Outcomes

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Pair of PIs

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Grad Students: “Follow the Money”

Alexis Biddle, J.D., M.C.R.P. + Rory Isbell, J.D., M.C.R.P.
Research Questions

Effectiveness ("Bang for the Buck"): How effectively are states and metropolitan planning organization (MPOs) advancing their own economic development, public health, and other livability goals with transportation investments?

Accountability & Transparency: How are states and MPOs making transportation investment decisions? How could (performance-based) decision-making processes be improved to provide better outcomes?
Best & Worst Practices

2016 ANNUAL AUTO ISSUE

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10 TOP PICKS OF THE YEAR

UNIVERSITY OF OREGON

SCI Sustainable Cities Initiative
Methodology

- **Case Studies**
  - Considered 10 states/MPOs; studied 6 states/MPOs in detail

- **Document Analysis**
  - Organizational structures
  - Constitutions & statutes
  - Long-range plans & goals
  - State & metropolitan transportation improvement Programs (STIPs & MTIPs); budgets
  - Other reports

- **Stakeholder Interviews**
  - Contacted 6 states & 6 MPOs with follow up questions
Questions

The End.

Actually, just the beginning.

To be continued...
Outline

1. Problem
2. Solutions
3. MAP-21
4. Conclusion
“Houston, we have a problem”
## Government Transportation Expenditures

<table>
<thead>
<tr>
<th>Mode</th>
<th>Expenditures (millions of $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway</td>
<td>206,251</td>
</tr>
<tr>
<td>Transit</td>
<td>55,150</td>
</tr>
<tr>
<td>Rail</td>
<td>1,752</td>
</tr>
<tr>
<td>Air</td>
<td>41,794</td>
</tr>
<tr>
<td>Water</td>
<td>13,261</td>
</tr>
<tr>
<td>Pipeline</td>
<td>86</td>
</tr>
<tr>
<td>General Support</td>
<td>1,523</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>319,817</strong></td>
</tr>
</tbody>
</table>
$ Flows Between Levels of Government

- Federal government:
  - Own-source revenue: $80 billion
  - Intergovernmental transfers: $46 billion
  - Direct spending on transportation: $103 billion

- State government:
  - Own-source revenue: $73 billion
  - Intergovernmental transfers: $23 billion

- Local government:
  - Own-source revenue: $58 billion
  - Intergovernmental transfers: $1 billion

- Transportation system:
  - Intergovernmental transfers: $107 billion
  - Direct spending on transportation: $46 billion
$ Flows in Massachusetts

Commonwealth Transportation Fund
$1.933 billion

MA Transportation Trust Fund
$1.071 billion

1. Motor Vehicle Sales Tax
$510.0m
2. Motor Fuels Taxes
$824.6m
3. Other (Highway fines, late charges, etc.)
$56.4m
4. Registry and Inspection Fees
$571.2m
5. Registry of Motor Vehicles Operations
$70.5m
6. Western Turnpike (Tolls, etc.)
$173.6m
7. Metropolitan Highway System (Tolls, etc.)
$222.9m
8. Tobin Bridge (Tolls, etc.)
$34.4m
9. Other (Permits, adverts, etc.)
$19.6m
10. CTF transfer to MTTF
$620.1m
11. Prison license plates (Department of Corrections)
$3.1m
12. Additional Assistance
$122.6m
13. Debt Service
$1.196 billion
14. CTF Transfer to RTAs
$40.0m
15. Transfer to RTAs through MTTF
FY15=$40.0m plus $1.3m earmarks
16. Debt Service
$171.0m
17. MassDOT Operations
$853.2m
For Highways, Office of the Secretary, and Aeronautics
18. MBTA Sales Tax Transfer
$970.6m
19. Local Gov’t Assessment (175 cities and towns)
$160.2m
20. MBTA Fares
$602.6m
21. MBTA Parking, Adverts, Real Estate
$43.3m
22. MBTA Debt Service
$413.4m

Regional Transit Authorities

Figures do not include state budget allocation for federal funding, capital budget outlays, MassPort, ferry authorities, or the one-time $32 million supplemental funding from the General Budget for fiscal year 2014 snow and ice operations spent in 2015. Also not included are: state parking ticket surcharges on rental cars (which are paid to municipalities), Merit Rating Board assessments (paid by insurance companies), gaming revenue transfers to the Transportation Infrastructure and Development Fund, or $31.1 million State Retiree Benefits transfer from the CTF.
$ Flows in Massachusetts

**Mass. Gen. Laws ch. 29, § 2ZZZ**

(a) There shall be established and set up on the books of the commonwealth a separate fund to be known as the Commonwealth Transportation Fund, which shall be used exclusively for financing transportation-related purposes. ...

(c) In addition to those revenues credited to the fund under subsection (a) there shall be credited to the fund all monies received by the commonwealth from the receipts from sales of motor vehicles under sections 3, 25 and 26 of chapter 64H and all monies received by the commonwealth on the sales price of purchases of motor vehicles under sections 4, 26 and 27 of chapter 64I, from the taxes imposed under said chapters 64H and 64I as excises upon the sale and use at retail of motor vehicles and upon the storage, use or other consumption of motor vehicles, including interest thereon or penalties; provided however, such amount shall not include any portion of the taxes that constitute special receipts within the meaning of subsection (b1/2) of section 10 of chapter 152 of the acts of 1997. The amount credited to the fund under this subsection shall be net of the dedicated sales tax revenue amount transferred to the Massachusetts Bay Transportation Authority State and Local Contribution Fund under section 35T of chapter 10 and to the School Modernization and Reconstruction Trust Fund under section 35BB of said chapter 10.

(d) Not less than the following amounts shall annually be distributed from the fund to the Massachusetts Bay Transportation Authority and regional transit authorities:

1. **$160,000,000 to the Massachusetts Bay Transportation Authority** or any fund controlled by the authority in each fiscal year; and

2. **$15,000,000 to regional transit authorities** organized under chapter 161B or predecessor statutes in each fiscal year. ...
## Location, Project Limits, Description, Scope of Work

Near Cholame, from 0.7 miles west of Davis Road to 0.5 miles west of Antelope Road. Convert to a 4 lane expressway.

<table>
<thead>
<tr>
<th>Component</th>
<th>Implementing Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA&amp;ED</td>
<td>Caltrans</td>
</tr>
<tr>
<td>PS&amp;E</td>
<td>Caltrans</td>
</tr>
<tr>
<td>Right of Way</td>
<td>Caltrans</td>
</tr>
<tr>
<td>Construction</td>
<td>Caltrans</td>
</tr>
</tbody>
</table>

## Purpose and Need

Heavy trucks and RV's comprise a very high percentage of the total traffic on this portion of Route 46. These vehicles typically experience a reduction in running speed of 31 km/h. There are limited passing opportunities on this segment, which contributes to driver frustration and passing miscalculations. Route 46 will continue to serve as a vital conduit for traffic to and from the San Joaquin Valley region and beyond, to the Central Coast. This project will reduce congestion, enhance safety and provide passing opportunities, improve the facilitation of goods movement, improve recreational travel and major east/west route from the San Joaquin Valley and Interstate 5 to the Central Coast and Route 101.

## Project Benefits

The Project benefits include: Safety Improvements, reduction of fatalities and injuries. The project supports a growing economy, improves the livability of the region, and reduces greenhouse gases. It is a Primary Goods Movement Route, and will provide Bike/Ped Improvements.

- Supports Sustainable Communities Strategy (SCS) Goals
- Reduces Greenhouse Gas Emissions
What the Public Sees

Gas Tax $ → Government
License Fee $ → Government
Fare $ → Government
Sales Tax $ → Government
Income Tax $ → Government

→ Highways
→ Transit
→ Bike / Ped
→ Airports
→ Marine

?
What the Public REALLY Sees

$   ?
Problem: Lack of Transparency

1. **Accountability:** Delivering desired results
   - “The continuous effort to use public dollars in the most efficient and cost-effective way” — Wisconsin DOT
   - “Demonstrating wise stewardship of public funds or generating a positive return on investment” — T4America

2. **Transparency:** In an understood manner
   - “In a free society, transparency is government’s obligation to share information with citizens. It is at the heart of how citizens hold their public officials accountable.” — Sunshine Review
   - “Broadly understood and accepted decision-making process” — T4America
Need: Report Outcomes to Taxpayers
A proposed 4-phase approach

1. Planning
   ◦ Set real-world goals that matter
   ◦ Determine actions to achieve outcomes

2. Funding
   ◦ Levy taxes to raise needed revenues
   ◦ Empower well-positioned decision-makers

3. Programming
   ◦ Invest in effective projects

4. Evaluating
   ◦ Monitor outcomes on the ground
   ◦ Report returns on investments to taxpayers
   ◦ Adjust expectations in light of experience
Benefits of Outcomes-Based Approach

- **Transparency:** Maintaining taxpayer confidence
- **Accountability:** Delivering value to the public
- **Bang for the Buck:** More value on the ground
- **Resolve Conflicts:** Amongst and between transportation and other policies
- **Additional Funding:** Make case to taxpayers
Four Phases in a Cycle

Planning

Evaluating

Funding

Programming
Physics Analogy: Adiabatic Expansion

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What Counts as “Transportation”?

- Residences
- Businesses
- Industries
- Schools
- Parks
- Surroundings
  - Health
  - Air Quality
  - Water Quality
  - Communities
  - Equity
- Transportation System
- Boundary
- Prices
- Income
- Demographics
1. Planning – Set Goals

*Set real-world goals that matter*

- **Identify Goals:** Learn what the public wants
- **Consider the “Three P’s / E’s”:** Think beyond traditional goals to prosperity, people & planet, i.e., economy, (social) equity & environment
- **Set Priorities:** Especially when goals conflict
  - *Example:* Is mobility or safety more important?
- **Quantify Performance:** Establish objectives, measures & targets
1. Preserve & manage the existing system
2. Support the state’s economy
3. Maximize safety and security
4. Provide for the efficient movement of people & freight
5. Build partnerships for sustainable & livable communities
6. Protect natural, cultural & environmental resources
7. Emphasize financial responsibility
1. Planning – Determine Actions

*Determine actions to achieve outcomes*

- **Identify Actions:** Consider a broad range of potential actions that affect the goals of interest

- **Develop Scenarios:** Determine a package of actions to achieve outcomes cost-effectively

- **Plan for Uncertainty:** As not all factors can be controlled and models are imperfect, plan for imperfect predictions
San Francisco: Plan Bay Area

Goals & Targets

<table>
<thead>
<tr>
<th>Goal/Outcome</th>
<th>Performance Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Protection</td>
<td>Reduce per-capita CO₂ emissions from cars and light-duty trucks by 15 percent</td>
</tr>
<tr>
<td>Adequate Housing</td>
<td>House 100 percent of the region’s projected growth from a 2010 baseline year by</td>
</tr>
<tr>
<td></td>
<td>income level (very-low, low, moderate, above-moderate) without displacing current</td>
</tr>
<tr>
<td></td>
<td>low-income residents (Statutory requirement, per SB 375)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voluntary</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy and Safe Communities</td>
<td>Reduce premature deaths from exposure to particulate emissions:</td>
</tr>
<tr>
<td></td>
<td>• Reduce premature deaths from exposure to fine particulates (PM₂.₅) by 10 percent</td>
</tr>
<tr>
<td></td>
<td>• Reduce coarse particulate emissions (PM₁₀) by 30 percent</td>
</tr>
<tr>
<td></td>
<td>• Achieve greater reductions in highly impacted areas</td>
</tr>
<tr>
<td></td>
<td>Reduce by 50 percent the number of injuries and fatalities from all collisions</td>
</tr>
<tr>
<td></td>
<td>(including bike and pedestrian)</td>
</tr>
<tr>
<td></td>
<td>Increase the average daily time walking or biking per person for transportation by</td>
</tr>
<tr>
<td></td>
<td>70 percent (for an average of 15 minutes per person per day)</td>
</tr>
<tr>
<td>Open Space and Agricultural Preservation</td>
<td>Direct all non-agricultural development within the urban footprint (existing urban</td>
</tr>
<tr>
<td></td>
<td>development and urban growth boundaries)</td>
</tr>
<tr>
<td>Equitable Access</td>
<td>Decrease by 10 percentage points (to 56 percent, from 66 percent) the share of</td>
</tr>
<tr>
<td>Economic Vitality</td>
<td>low-income and lower-middle income residents’ household income consumed by</td>
</tr>
<tr>
<td>Transportation System Effectiveness</td>
<td>transportation and housing</td>
</tr>
<tr>
<td></td>
<td>Increase gross regional product (GRP) by 110 percent — an average annual growth</td>
</tr>
<tr>
<td></td>
<td>rate of approximately 2 percent (in current dollars)</td>
</tr>
<tr>
<td></td>
<td>Increase non-auto mode share by 10 percentage points (to 26 percent of trips)</td>
</tr>
<tr>
<td></td>
<td>Decrease automobile vehicle miles traveled per capita by 10 percent</td>
</tr>
<tr>
<td></td>
<td>Maintain the transportation system in a state of good repair:</td>
</tr>
<tr>
<td></td>
<td>• Increase local road pavement condition index (PCI) to 75 or better</td>
</tr>
<tr>
<td></td>
<td>• Decrease distressed lane-miles of state highways to less than 10 percent of</td>
</tr>
<tr>
<td></td>
<td>total lane-miles</td>
</tr>
<tr>
<td></td>
<td>• Reduce share of transit assets past their useful life to 0 percent</td>
</tr>
<tr>
<td></td>
<td>(Note: Baseline year is 2012.)</td>
</tr>
</tbody>
</table>

Projected Outcomes

<table>
<thead>
<tr>
<th>Target Achieved (5)</th>
<th>Right Direction (5)</th>
<th>Wrong Direction (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Protection</td>
<td>Healthy and Safe Communities</td>
<td>Housing + Transportation Affordability</td>
</tr>
<tr>
<td>Adequate Housing</td>
<td>Affordable Housing</td>
<td>Displacement Risk</td>
</tr>
<tr>
<td>Open Space and Agricultural Preservation</td>
<td>Non-Auto Mode Shift</td>
<td>Access to Jobs</td>
</tr>
<tr>
<td>Middle-Wage Job Creation</td>
<td>Road Maintenance</td>
<td></td>
</tr>
<tr>
<td>Goods Movement/Congestion Reduction</td>
<td>Transit Maintenance</td>
<td></td>
</tr>
</tbody>
</table>
2. Funding – Levy Taxes

Levy taxes to raise needed revenues

- **Secure Revenues:** Levy taxes & fees to fund transportation actions
- **Be Accountable:** Needed to maintain taxpayer support
- **Price Efficiently:** Taxes & fees aren’t merely sources of revenue, but also actions that create incentives & disincentives that impact the transportation system
The key findings of the scenario analysis are the following:

Under the "Historical Funding" scenario, performance of all assets would deteriorate with the most significant declines occurring in roadway pavement, bridges, and delay; and all MBTA assets except accessibility.

"Current Funding" improves performance relative to the Historical Funding scenario. MassDOT will be able to maintain roadway performance at close to Current Funding levels through at least 2023, while performance of MBTA and RTA buses and trains will be improved.

**Appendix Figures Key:**

- Historical Funding
- Current Funding

**Figure A.1 Bridge Condition**

- 2023: Existing Condition
- 2040: Existing Condition

**Figure A.2 Pavement Condition**

- 2023: Existing Condition
- 2040: Existing Condition

**Figure A.3 Mobility Condition**

- 2023: Existing Condition
- 2040: Existing Condition
2. Funding – Empower

Empower well-positioned decision-makers

- **Allocate:** Provide funding to decision-makers with sufficient breadth of responsibility and familiarity with issues

- **Give Flexibility / Eliminate Constraints:** Decision-makers need sufficient flexibility—lack of constraints—to fund the most effective actions

- **Hold Accountable:** Hold decision-makers accountable for achieving outcomes
“Transportation decision making in Virginia suffers from an inability to marshal the resources and the authority to make transportation funding and investment decisions that both offer the appropriate nexus of decision making and provide an appropriate level of funding to address regional transportation challenges.” —Office of Intermodal Planning and Investment, 2009
### Constitutional & Statutory Constraints

#### Table 25: Dedications of State Fuel Taxes in State Law

<table>
<thead>
<tr>
<th>State</th>
<th>Dedications of State Fuel Taxes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Alaska</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Arizona</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>Constitutional and statutory</td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>With exceptions</td>
<td></td>
</tr>
<tr>
<td>Colorado</td>
<td>With a limited exception for local entities</td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Delaware</td>
<td>+</td>
<td>Session law, constitutional restriction pending</td>
</tr>
<tr>
<td>Florida</td>
<td>With exceptions</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Hawaii</td>
<td>Includes bikeways and trails</td>
<td></td>
</tr>
<tr>
<td>Idaho</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>Roads and bridges, public transit</td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Iowa</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Kansas</td>
<td>Constitutional and statutory</td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Louisiana</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Maine</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>Constitutional and statutory, with exceptions</td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Roads and bridges, public transit, with exceptions</td>
<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>At least 90 percent must be used for roads, streets, and bridges</td>
<td></td>
</tr>
<tr>
<td>Minnesota</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>With exceptions</td>
<td></td>
</tr>
<tr>
<td>Missouri</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Montana</td>
<td>With exceptions</td>
<td></td>
</tr>
<tr>
<td>Nebraska</td>
<td>+</td>
<td>Roads and bridges, public transit</td>
</tr>
<tr>
<td>Nevada</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>New Mexico</td>
<td>+</td>
<td>With exceptions</td>
</tr>
<tr>
<td>New York</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>+</td>
<td>With exceptions</td>
</tr>
<tr>
<td>North Dakota</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Oklahoma</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Oregon</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Rhode Island</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>South Dakota</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Tennessee</td>
<td>+</td>
<td>With exceptions</td>
</tr>
<tr>
<td>Texas</td>
<td>With exceptions</td>
<td>State constitution dedicates three-fourths of fuel tax revenues to roads and bridges and one-fourth to the Available School Fund</td>
</tr>
<tr>
<td>Utah</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Vermont</td>
<td>+</td>
<td>With exceptions</td>
</tr>
<tr>
<td>Virginia</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>West Virginia</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Wisconsin</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Wyoming</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>District of Columbia</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>
3. Programming

Invest in effective projects

● **Fund What’s Planned:** Ideally, the most effective projects are already planned, making programming a lesser exercise in timing.

● **Think Multi-Modal / Jurisdictional:** Fund the most effective projects, regardless of mode or jurisdiction.

● **Assess Benefits & Costs:** Review not only benefits but also costs—“bang for the buck”
### Virginia: SMART SCALE Measures

<table>
<thead>
<tr>
<th>Factor Area</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety</strong></td>
<td>S.1 Number of Fatal and Injury Crashes (50%)</td>
</tr>
<tr>
<td></td>
<td>S.2 Rate of Fatal and Injury Crashes (50%)</td>
</tr>
<tr>
<td><strong>Congestion Mitigation</strong></td>
<td>C.1 Person Throughput (50%)</td>
</tr>
<tr>
<td></td>
<td>C.2 Person Hours of Delay (50%)</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>A.1 Access to Jobs (60%)</td>
</tr>
<tr>
<td></td>
<td>A.2 Access to Jobs for Disadvantaged Persons (20%)</td>
</tr>
<tr>
<td></td>
<td>A.3 Access to Multimodal Choices (20%)</td>
</tr>
<tr>
<td><strong>Environmental Quality</strong></td>
<td>E.1 Air Quality and Environmental Effect (50%)</td>
</tr>
<tr>
<td></td>
<td>E.2 Impact to Natural and Cultural Resources (50%)</td>
</tr>
<tr>
<td><strong>Economic Development</strong></td>
<td>ED.1 Project Support for Economic Development (60%)</td>
</tr>
<tr>
<td></td>
<td>ED.2 Intermodal Access and Efficiency (20%)</td>
</tr>
<tr>
<td></td>
<td>ED.3 Travel Time Reliability (20%)</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>L.1 Transportation-Efficient Land Use (100%)</td>
</tr>
</tbody>
</table>

* for areas over 200,000 in population
Virginia: SMART SCALE Scorecard

McVitty and Old Cave Spring Road Improvements

Improve safety and congestion at McVitty Rd (Rte 1662) and Old Cave Spring Rd (Rte 1663) by reconstructing the intersection, widening lanes and shoulders, adding turn lanes, improving curves, and upgrading Rte 419/1662 signal.

Performance

- VTrans Need: Cave Spring Urban Development Area
- Click for details

Project Benefit Score

- Final Score: 1.4
- District Rank: 23/37
- Statewide Rank: 177/287

HB2 COST:

- TOTAL COST: $12,946,546

HB2 Funding the Right Transportation Projects

App Id: 605

Eligible Funding Program(s):
- District Grant

Performance Breakdown:

- Congestion Mitigation
- Safety
- Accessibility
- Environment
- Economic Development
- Land Use

<table>
<thead>
<tr>
<th>Metric</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial crashes per mile lane</td>
<td>0.3</td>
</tr>
<tr>
<td>Older/Higher Speed limit</td>
<td>0</td>
</tr>
<tr>
<td>Ruralization of rural areas</td>
<td>2.2</td>
</tr>
<tr>
<td>Number of driveway crossings</td>
<td>0</td>
</tr>
<tr>
<td>Quality of rural areas</td>
<td>0</td>
</tr>
<tr>
<td>Accessibility to Jobs (benefit to traveler)</td>
<td>8.0</td>
</tr>
<tr>
<td>Economic Development (benefit to traveler)</td>
<td>0</td>
</tr>
<tr>
<td>Transportation Efficiency (benefit to travel)</td>
<td>0</td>
</tr>
<tr>
<td>Total Benefit</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Expenditures to Date: $10,446,466

Key Fund Sources:

- HB2
- VDOT
- Administered By: VDOT

Project Location: Roanoke County

HB2 Area Type: Roanoke County

Total Project Cost: $12,930,574

HB2 Request: $12,946,546

Preliminary Engineering: Underway

Right of Way: Not Started

Construction: Not Started

Expenditures to Date: $5,388,339

Key Fund Sources:

- Federal/Historic Preservation

Expenditures to Date: $10,446,466

Administered By: VDOT

Eligible Funding Program(s):

- District Grant

Click for details
Tennessee: DL3 Criteria Weights

TRAFFIC OPERATIONS 25.8%
Multimodal / Func. Class 4.2%
Economic Development 26.3%
Roadway Safety 26.3%
Region/MPO/RPO Rank 23.6%
Environmental Impact 3.4%
Monitor outcomes on the ground

- **Measure Outcomes:** Measure outcomes on the ground over time after projects are implemented (as opposed to just modeling before)

- **Track Cause & Effect:** Link outcomes back to actions (as opposed to those due to external factors)
Figure 1: Total Annual Greenhouse Gas Emissions (MMT CO$_2$e) by Sector from 1990 – 2013

Report returns on investments to taxpayers

- **Be Accountable:** Report what outcomes were delivered—at what cost

- **Be Transparent:** Report how were decisions made

- **Be Accessible:** Report succinctly in plain English to the general public
Utah’s Unified Plan

<table>
<thead>
<tr>
<th>Goals</th>
<th>Key Objectives</th>
<th>Key Performance Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Reduce the number of fatal and serious injuries on the transportation system</td>
<td>Fatalities + serious injuries per capita</td>
</tr>
<tr>
<td>Economic Vitality</td>
<td>Increase the number of jobs and services that Utahns can reach within a certain travel time</td>
<td>Increase the number of jobs and services that Utahns can reach within a certain travel time</td>
</tr>
<tr>
<td>State of Good Repair</td>
<td>Keep infrastructure in good condition</td>
<td>Cost/benefit savings from proper maintenance</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Reduce emissions that adversely affect health, quality of life and the economy</td>
<td>Key mobile source ozone and PM_{10} emissions</td>
</tr>
<tr>
<td>Mobility &amp; Accessibility</td>
<td>Reduce the likelihood of driving long distances daily</td>
<td>Vehicle miles traveled per capita</td>
</tr>
<tr>
<td></td>
<td>Increase the share of trips using non-single-occupant vehicle modes</td>
<td>Commute mode split percentages</td>
</tr>
</tbody>
</table>
Transportation Funding, Fiscal Year 2014
Where it comes from and where it goes
$3.14 billion

Sources of Minnesota state transportation funds:
- Federal Aid: Trunk Highway
- State Fuel Tax
- Motor Vehicle Sales Tax (MVST)
- Motor Vehicle Registration Tax
- Federal Aid: Local Roads and Multimodal
- Bond Proceeds
- Other Income and Transfers

About 80 percent of MnDOT funds are appropriated by the legislature and 20 percent are statutorily appropriated. Sources of legislative appropriations include state motor fuel taxes, motor vehicle registration fees, motor vehicle sales taxes (MVST), and federal motor fuel tax grants.

Uses of Minnesota state transportation funds:
- State Aid for Local Transportation
- Public Safety Department
- Multimodal Systems
- Operations and Maintenance
- State Road and Bridge Construction
- Program Planning and Delivery
- Debt Service
- Agency Management and Other

MnDOT is a multi-modal agency. Its activities include transit, aviation, freight and commercial vehicles, construction, maintenance, and operation of 12,000 miles of state highways. Approximately 30% of MnDOT’s appropriations are state aid to local governments for road and bridge projects and other activities.

Note 1: Revenues and expenditures of the Metropolitan Airports Commission (MAC) and Metro Transit are not included.
Note 2: Data from the State of Minnesota Revenue and Expenditures for Transportation Purposes (flowchart) (budgetary basis). Includes bond expenditures. Total of Sources differs from Uses due to fund balance changes.
4. Evaluating—Adjust Expectations

Adjust expectations in light of experience

- **Analyze Outcomes**: Compare expected to actual outcomes to improve understanding of effectiveness of actions and accuracy of models.

- **Revisit Goals**: Revise performance targets based on progress.
Outcomes-Based Summary

1. Planning
   - Set real-world goals that matter
     ✓ Identify goals
     ✓ Consider the “three P’s / E’s”
     ✓ Set priorities
     ✓ Quantify performance
   - Determine actions to achieve outcomes
     ✓ Identify actions
     ✓ Develop scenarios
     ✓ Plan for uncertainty

2. Funding
   - Levy taxes to raise needed revenues
     ✓ Secure revenues
     ✓ Be accountable
     ✓ Price efficiently
   - Empower well-positioned decision-makers
     ✓ Allocate
     ✓ Give flexibility / eliminate constraints
     ✓ Hold accountable

3. Programming
   - Invest in effective projects
     ✓ Fund what’s planned
     ✓ Think multi-modal / jurisdictional
     ✓ Assess benefits & costs

4. Evaluating
   - Monitor outcomes on the ground
     ✓ Measure outcomes
     ✓ Track cause & effect
   - Report returns on investments to taxpayers
     ✓ Be accountable
     ✓ Be transparent
     ✓ Be accessible
   - Adjust expectations in light of experience
     ✓ Analyze outcomes
     ✓ Revisit goals
MAP-21: Declaration of Policy

“Performance management will transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decision-making through performance-based planning and programming.”
1. **Safety:** To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

2. **Infrastructure Condition:** To maintain the highway infrastructure asset system in a state of good repair.

3. **Congestion Reduction:** To achieve a significant reduction in congestion on the National Highway System.

4. **System Reliability:** To improve the efficiency of the surface transportation system.

5. **Freight Movement & Economic Vitality:** To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

6. **Environmental Sustainability:** To enhance the performance of the transportation system while protecting and enhancing the natural environment.

7. **Reduced Project Delivery Delays:** To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies’ work practices.
MAP-21: Performance Measures

Highways

- **National Highway Performance Program (NHPP):** condition of pavement & bridges; performance of Interstate System & National Highway System
- **Highway Safety Improvement Program (HSIP):** serious injuries & fatalities
- **Congestion Mitigation & Air Quality Program (CMAQ):** traffic congestion & emissions
- **National Freight Movement:** freight movement on the Interstate System

Public Transportation

- **Transit Asset Management:** condition assessment
- **Public Transportation Safety Program:** safety risk management & safety assurance
MAP-21: Responsibilities

- **U.S. DOT**
  - Establish performance measures

- **States**
  - Set targets (within 1 year)
  - Report progress (within 4 years and then every 2 years)

- **MPOs**
  - Set targets (within 1 year)
  - Report progress (within 4 years and then every 2 years)
Performance-Based Planning & Programming
# MAP-21 vs. Outcomes-Based?

<table>
<thead>
<tr>
<th></th>
<th>MAP-21</th>
<th>Outcomes-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning</strong></td>
<td>• State DOTs &amp; MPOs focus narrowly on transportation system</td>
<td>• Account for factors interacting with transportation system: land use, economy, etc.</td>
</tr>
<tr>
<td><strong>Funding</strong></td>
<td>• Do not see taxing &amp; allocating as performance-based decisions</td>
<td>• Focus especially on allocating to ensure flexibility / eliminate constraints to invest in most effective projects</td>
</tr>
<tr>
<td><strong>Programming</strong></td>
<td>• Not necessarily tightly linked with planning</td>
<td>• Strong planning should mostly inform programming</td>
</tr>
<tr>
<td><strong>Evaluating</strong></td>
<td>• Not tracking cause &amp; effect</td>
<td>• Integrate planning, programming &amp; evaluating to analyze cause &amp; effect</td>
</tr>
</tbody>
</table>
Summary

- Focus on outcomes that matter, and set priorities
- Develop scenarios, and plan for uncertainty
- Empower decision-makers with broad responsibilities, allocate flexible funding, and hold accountable
- Invest in projects that achieve performance measures effectively: “bang for the buck”
- Monitor outcomes over time, and track cause & effect
- Be accountable, transparent & accessible to the public
- Adjust expectations in light of experience
Conclusion

1. Planning
   ◦ **Set real-world goals that matter**
     ✓ Identify goals
     ✓ Consider the “three P’s / E’s”
     ✓ Set priorities
     ✓ Quantify performance
   ◦ **Determine actions to achieve outcomes**
     ✓ Identify actions
     ✓ Develop scenarios
     ✓ Plan for uncertainty

2. Funding
   ◦ **Levy taxes to raise needed revenues**
     ✓ Secure revenues
     ✓ Be accountable
     ✓ Price efficiently
   ◦ **Empower well-positioned decision-makers**
     ✓ Allocate
     ✓ Give flexibility / eliminate constraints
     ✓ Hold accountable

3. Programming
   ◦ **Invest in effective projects**
     ✓ Fund what’s planned
     ✓ Think multi-modal / jurisdictional
     ✓ Assess benefits & costs

4. Evaluating
   ◦ **Monitor outcomes on the ground**
     ✓ Measure outcomes
     ✓ Track cause & effect
   ◦ **Report returns on investments to taxpayers**
     ✓ Be accountable
     ✓ Be transparent
     ✓ Be accessible
   ◦ **Adjust expectations in light of experience**
     ✓ Analyze outcomes
     ✓ Revisit goals
Thank You

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Rob Zako, Ph.D.
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“Effectiveness of Transportation Funding Mechanisms for Achieving National, State, and Metropolitan Economic, Health, and Other Livability Goals”

http://nitc.trec.pdx.edu/research/project/875/