2017

Better Outcomes: Improving Accountability & Transparency in Transportation Decision-Making

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Credits

The authors gratefully acknowledge Transportation for America for their contributions to this report: James Corless, Adrea Turner, Beth Osborne, Joe McAndrew, Alex Depompolo, Chris Rall and Steve Davis.
The authors also appreciate the advice of Deron Lovaas at the Natural Resources Defense Council.

This report builds on a longer academic project on the effectiveness of transportation investments. University of Oregon graduate students Alexis Biddle and Rory Isbell did much of the basic research.
The authors also thank staff with DOTs and MPOs in California, Massachusetts, Minnesota, Tennessee, Utah and Virginia, who generously shared their expertise and insights.

This report was funded in part by the National Institute for Transportation and Communities (NITC), a program of the Transportation Research and Education Center at Portland State University and a U.S. Department of Transportation university transportation center.

All links to pages or documents in this paper were accessible when retrieved as of September 6, 2017.

Executive Summary

This report aims to help policymakers and staff at all levels of government make transportation investments that serve the public better.

Amazingly, we simply don't know how effective government spending is at achieving the outcomes the public expects and has been promised! Clearly, taxpayer dollars buy roads, bus service, airports, ferry service, and other transportation facilities and services. But it is unclear how well such investments help get people where they want to go, create jobs, improve public health, support community development, and provide other benefits. In other words, it is uncertain how cost-effectively the means (transportation investments) achieve the ends (public benefits)—how much "bang for the buck" transportation investments provide.

States, metropolitan planning organizations (MPOs) and local governments have opportunities to incorporate outcomes into all phases of transportation decision-making. This report recommends that governments make transportation investment decisions using a four-phase outcomes-based cycle: planning, governance & finance, programming, and reporting.

In more detail, this report offers eight sets of recommendations, summarized in Table 2, to improve on current guidance and practice:

Phase 1: Planning

What outcomes do we want? What investments will be effective?

- ➔ Develop performance measures that reflect local priorities.
- ➔ Plan to achieve desired outcomes cost-effectively.

Phase 2: Governance & Finance

What sources of money are available? How can it be used? Who decides how to use it?

- ➔ Tie sources of funding to desired outcomes.
- ➔ Provide flexibility to make cost-effective investments.
- ➔ Delegate investment decisions to policymakers with sufficiently broad authority.

Phase 3: Programming

What investments do we make?

- ➔ Make cost-effective investments to achieve desired outcomes.

Phase 4: Reporting

How did our investments perform? What do we report to the public?

- ➔ Analyze outcomes and adjust expectations.
- ➔ Report returns on investments to taxpayers.

Our recommendations are not entirely new, but rather build on the Moving Ahead for Progress in the 21st Century Act (MAP-21) and especially the Federal Highway Administration's *Performance-Based Planning and Programming Guidebook*.

Although a performance-based approach is good, we recommend focusing on **outcomes** more than **output measures**. Outputs are the actual product or service provided by an organization: added or repaired highway lane-miles, hours of bus service, and miles of sidewalks. But what really matters to Americans are the outcomes that might or might not result from the direct products of transportation spending: How many people get to work how much faster? How many new jobs are created? How well are downtown businesses thriving? To what extent are people walking and bicycling more and living healthier lives?

We also highlight the critical importance of transportation **governance and finance structures**. Typically, higher levels of government set the "rules of the game" by which lower levels of government must play: What sources of money are available? How can it be used? Who decides how to use it? Such structures can help or hinder efforts to make cost-effective investments to achieve desired outcomes.

We also recommend a greater emphasis on **accountability and transparency**—to the public. Longer and more detailed technical documents such as investment programs and budgets are necessary and useful within and amongst governments. But to enjoy the trust and support of taxpayers, governments at all levels need to be more accountable in reporting outcomes achieved and more transparent in communicating how decisions are made.

We hope these ideas will inspire some states, MPOs and local governments to improve their transportation decision-making processes to better deliver results to the public, and to provide increased accountability and transparency.

This report outlines an ideal four-phase process for delivering the transportation outcomes the public wants. Although various states and MPOs are successfully adopting some elements of this ideal process, none have yet embraced all elements. Fortunately, it isn't necessary to attempt all steps as once. Progress can be made incrementally. For more details, see the examples and references. The final section offers suggestions on getting started with an outcomes-based approach.

Ultimately, especially in an era of limited resources, we all have reasons for making sure that transportation investments can be stretched further and do more to deliver results to the public. Let's keep sharing with each other what works best.

Introduction

To get more "bang for the buck," Americans need accountable and transparent transportation decision-making.

Amazingly, we simply don't know how effective government spending is at achieving the outcomes the public expects and has been promised! To enjoy the trust and support of taxpayers, governments at all levels need to be more accountable in reporting outcomes achieved and more transparent in communicating how decisions are made. States, metropolitan planning organizations (MPOs) and local governments have opportunities to incorporate outcomes into all phases of transportation decision-making.

Americans want more bang for the buck

Taxpayers expect their investments in transportation to deliver results.

On behalf of Americans, federal, state and local governments combined spent roughly $320 billion—$1,000 per capita — on all modes of transportation in 2012.[1] See Figure 1.

As **Massachusetts** Secretary of Transportation Stephanie Pollack explained, "Transportation is not important for what it is, it's important for what it does."[2] "The return on investment in transportation … is not just measured in how many people physically use it. It's also measured in improvements to the economy, decreases in people's commuting time, creation of new jobs and reduction in greenhouse gases."[3]

We know that transportation investments produce **outputs**. These include added or repaired highway lane-miles, hours of bus service, and miles of sidewalks. But what really matters to Americans are the **outcomes** that might or might not result from the direct products of transportation spending: How many people get to work how much faster? How many new jobs are created? How well are downtown businesses thriving? To what extent are people walking and bicycling more and living healthier lives? See sidebar on terminology. According to a Pew Center on the States report, "States generally have the goals, performance measures and data to help them measure progress on safety and infrastructure preservation. But in several other important areas—including jobs and commerce and environmental stewardship—policymakers and the public in many states need better and more information about the results they are getting for their money."[4]

Through our own in-depth academic research, we reached a similar conclusion: Beyond which transportation projects were funded, i.e., outputs, quantitative information on the outcomes actually achieved by these transportation investments aren't systematically measured.[5]

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1 Bureau of Transportation Statistics, last modified May 2014, www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/government_transportation_financial_statistics/2014/table_15a.html.

2 Robert Aicardi, "Braintree Mayor Sullivan previews report on South Shore transportation priorities," *Braintree Forum*, Jul. 19, 2016, http://braintree.wickedlocal.com/news/20160719/braintree-mayor-sullivan-previews-report-on-south-shore-transportation-priorities.

3 Daniel C. Vock, "Massachusetts' Unlikely Transit Team," *Governing*, Apr. 2016, www.governing.com/topics/transportation-infrastructure/gov-massachusetts-transit-stephanie-pollack.html.

4 Pew Center on the States & Rockefeller Foundation, *Measuring Transportation Investments: The Road to Results* (2011), iii, www.pewtrusts.org/en/research-and-analysis/reports/0001/01/01/measuring-transportation-investments.

5 Rebecca Lewis & Rob Zako, *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.

Terminology

The Federal Highway Administration (FHWA) defines the following terms:

- A **goal** is a broad statement that describes a desired end state, for example, a safe transportation system.
- An **objective** is a specific, measurable statement that supports achievement of a goal, for example, reduce highway fatalities.
- A **performance measure** is a quantity used to assess progress toward meeting an objective, for example, the number of highway fatalities per year or the fatality rate per vehicle mile traveled.
- A **target** is a specific level of a performance measure that is desired to be achieved within a certain time frame, for example, reduce fatalities by 5% by 2015, which will save more than 150 lives.[1]

Numerous agencies further distinguish between different kinds of performance measures:

- An **input measure** is used to identify the human and capital resources used to produce the outputs and outcomes.
- A **process measure** is used to distinguish the intermediate steps in producing a product or service.
- An **output measure** is used to measure the actual product or service provided by the organization.
- An **outcome measure** assesses the expected, desired, or actual result(s) by which the outputs of the activities of the organization meet the desired results.
- An **impact measure** evaluates the direct or indirect effects as a result of attaining the goals of the program.[2]

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1 Federal Highway Administration, *Performance-Based Planning and Programming Guidebook* (2013), 12, www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook/page02.cfm.

2 Federal Highway Administration & Federal Transit Administration, *Performance-Based Planning and Performance Measures: Peer Exchange* (held July 13, 2010, in Minneapolis, MN), 3–4, http://planning.dot.gov/Peer/minnesota/minneapolis_2010.pdf; Lalita Sen, et al., *Performance Measures for Public Transit Mobility Management* (Texas Transportation Institute, 2011), table 6, http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/0-6633-1.pdf; Will Artly and Suzanne Stroh, *Establishing an Integrated Performance Measurement System*, vol. 2 of *The Performance-Based Management Handbook, A Six-Volume Compilation of Techniques and Tools for Implementing the Government Performance and Results Act of 1993* (Performance-Based Management Special Interest Group, U.S. Department of Energy and Oak Ridge Associated Universities, 2001), 36, http://qiroadmap.org/?wpfb_dl=17; Office of Management and Budget, *Primer on Performance Measurement*, 1995, http://govinfo.library.unt.edu/npr/library/resource/gpraprmr.html.

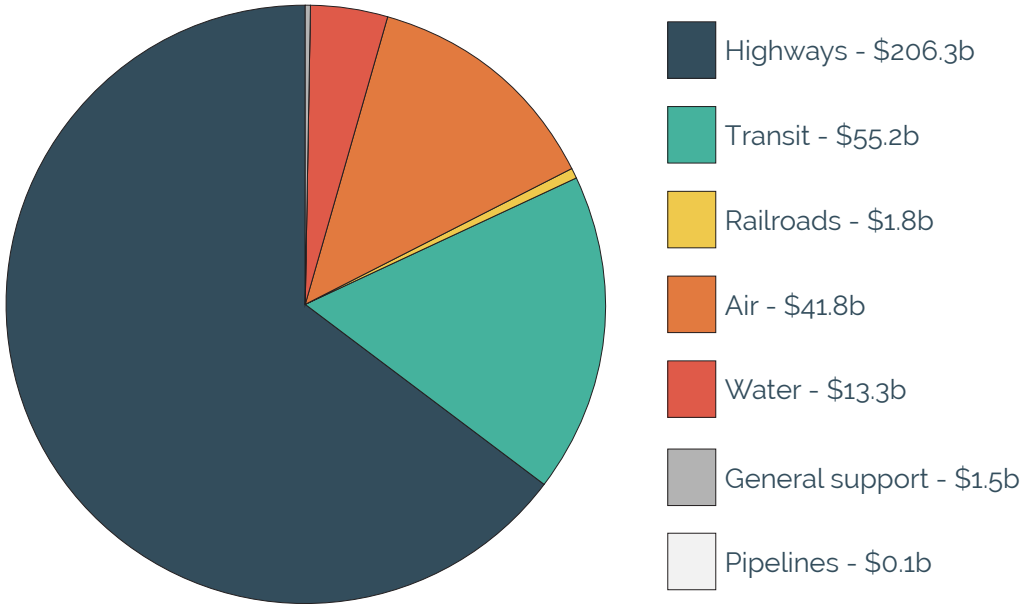

Figure 1: Federal, state & local governments spent $320 billion on transportation in 2012.

Lacking information about results on the ground, many Americans are understandably skeptical of paying more taxes.

Many boondoggle projects give the appearance of having value when justified by public officials based on decades-old studies, speculative economic development promises, or fears of hypothetical future traffic congestion. On closer inspection, however, the rationale for the massive expense proposed for these projects often is not reflected in any measured outcomes.[1]

In addition to a lack of measured outcomes, federal funding for transportation has gotten much tighter over the past few decades. Congress has not raised the federal gas tax since 1993.[2] Adjusted for inflation—but not changes in fuel efficiency, miles driven or construction costs—the federal gas tax actually buys 40% less today than it did 24 years ago.

Moreover, when governments fail to be accountable and transparent, it is often difficult to even "follow the money" from sources to uses. The flow of funding can resemble a tangled system of pipes. More than half of all funding for highways and transit comes from federal and state sources, but more than half of all spending occurs at the local level.[3] See Figure 2. Moreover, the flow of funding just within a state between accounts, agencies and programs is typically difficult to follow.[4] See Figure 3.

1 U.S. Public Interest Research Group, *Highway Boondoggles 2: More Wasted Money and America's Transportation Future* (2016), 9, www.uspirg.org/reports/usp/highway-boondoggles-2.

2 Federal Highway Administration, "When did the Federal Government begin collecting the gas tax?," last modified Nov. 18, 2015, www.fhwa.dot.gov/infrastructure/gastax.cfm.

3 Pew Charitable Trusts, *Intergovernmental Challenges in Surface Transportation Funding: First Report in the Fiscal Federalism in Action Series* (2014), fig. 3, www.pewtrusts.org/~/media/assets/2014/09/surfacetransportationintergovernmentalchallengesfunding.pdf.

4 Phineas Baxandall, "What Does Massachusetts Transportation Funding Support and What Are the Revenue Sources," Jan. 17, 2017, www.massbudget.org/report_window.php?loc=What-Does-MA-Transportation-Funding-Support.html.

In the face of such complexity, the average citizen has little hope of understanding on their own what outcomes their money is buying.

A government is accountable when it acts responsibly to deliver benefits the public values. According to the **Wisconsin** Department of Transportation, accountability is "the continuous effort to use public dollars in the most efficient and cost-effective way."[1]

A government is transparent when it acts in an open, broadly understood and accepted 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."[2]

To enjoy the trust and support of taxpayers, governments at all levels need to be more accountable in reporting outcomes achieved and more transparent in communicating how decisions are made.

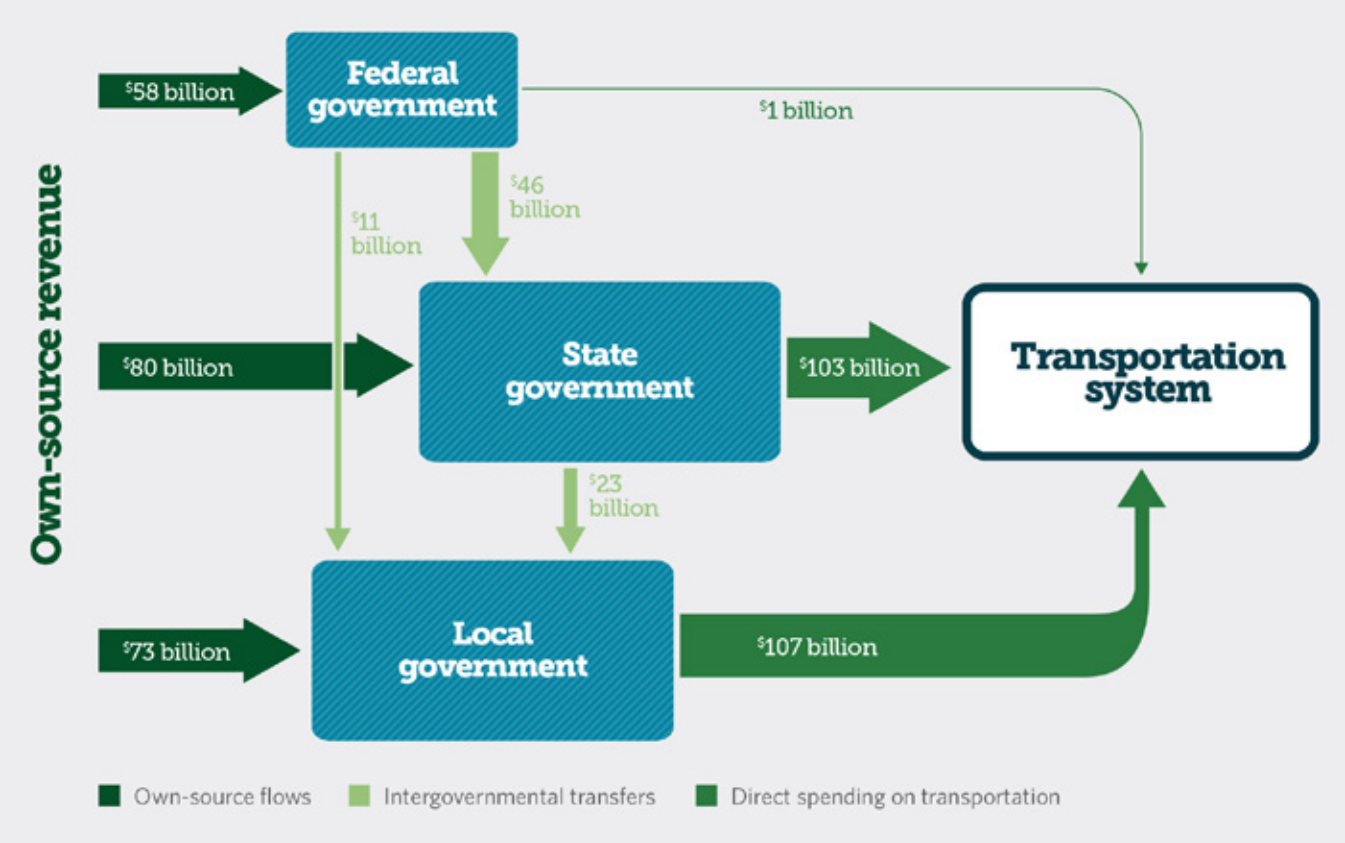

Figure 2: Transportation decision-making is distributed amongst federal, state and local governments.

1 Wisconsin Department of Transportation, "Accountability," last modified Jan. 2017, http://wisconsindot.gov/Pages/about-wisdot/performance/mapss/goalaccountability.aspx.

2 Ballotpedia, "Government transparency," http://ballotpedia.org/Government_transparency.

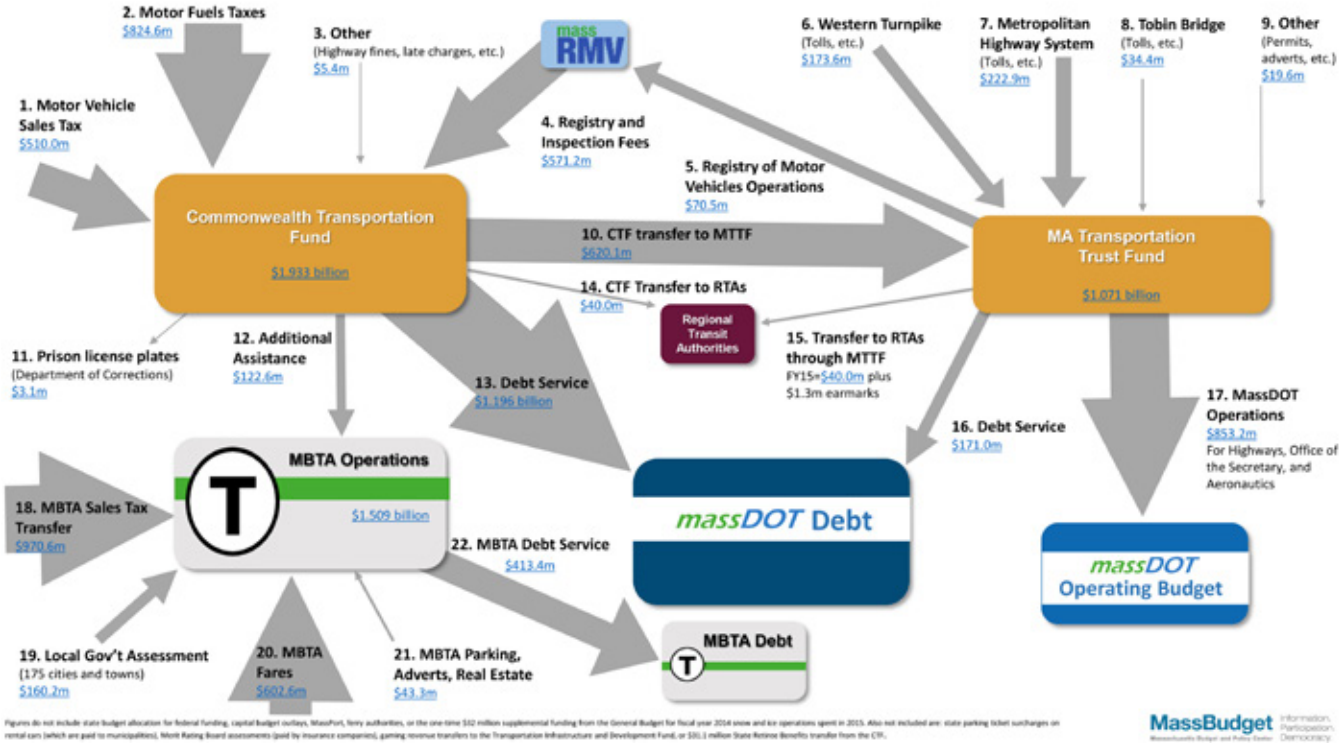

Figure 3: Even within a single state such as Massachusetts numerous decisions control the flow of transportation funding.

Focus on outcomes

Governments at all levels need to focus more on outcomes.

Adopted in 2012, the federal Moving Ahead for Progress in the 21st Century Act (MAP-21) builds on prior federal efforts to improve accountability and efficiency.[1] MAP-21 directs the U.S. Department of Transportation to establish performance measures. It further directs states and metropolitan planning organizations (MPOs) to set performance targets and report progress towards achieving them.[2] But the goals and performance measures mandated by MAP-21 represent just a subset of what many jurisdictions view as important.[3]

A significant challenge is that MAP-21 calls for meeting performance targets without significantly reforming federal policies for state and local transportation decision-making processes to support more cost-effective investments. Governments need to focus on outcomes in all phases of transportation decision-making, and to better integrate these decisions. Moreover, it is unrealistic to hold state and local decision-makers accountable for achieving targets unless they have sufficient authority, flexibility and resources to make the most cost-effective investments.

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1 The Government Performance and Results Act of 1993 (Pub. L. 103-62), signed by President Clinton, required agencies to engage in performance management tasks such as setting goals, measuring results, and reporting their progress. The GPRA of 2010 (Pub. L. 111-352), signed by President Obama, modernized those requirements. See especially General Accounting Office, *Department of Transportation: Status of Achieving Key Outcomes and Addressing Major Management Challenges*, 2001, www.gao.gov/products/GAO-01-834.

2 Federal Highway Administration, "Performance Management," last modified Sep. 12, 2013, www.fhwa.dot.gov/map21/factsheets/pm.cfm.

3 Partnership for Sustainable Communities, "Livability Principles," last modified Oct. 31, 2013, www.sustainablecommunities.gov/mission/livability-principles.

Although MAP-21 is still being rolled out, the U.S. Government Accountability Office recently concluded: "It is not clear whether the federal funding provided to states and other grantees through these surface transportation programs has improved the Nation's system performance because, among other things, these programs have lacked links to performance and national goals."[1]

Plan Bay Area 2040 outcome measures and targets

The **San Francisco Bay Area** offers a good model for an outcomes-based approach. In 2015, the Metropolitan Transportation Commission (MTC) adopted 13 outcome measures and targets. Note how traditional output measures related to infrastructure condition are recast as outcome measures significant to the public.[2] See Table 1.

Goal		Target
Climate protection	1.	Reduce per-capita CO2 emissions from cars and light-duty trucks by 15%
Adequate housing	2.	House 100% of the region's projected growth by income level without displacing current low-income residents and with no increase in in-commuters over the Plan baseline year
Healthy and safe communities	3.	Reduce adverse health impacts associated with air quality, road safety, and physical inactivity by 10%
Open space and agricultural preservation	4.	Direct all non-agricultural development within the urban footprint (existing urban development and UGBs)
Equitable access	5.	Decrease the share of lower-income residents' household income consumed by transportation and housing by 10%
	6.	Increase the share of affordable housing in Priority Development Areas (PDA), Transit Priority Areas (TPA), or high-opportunity areas by 15%
	7.	Do not increase the share of low- and moderate-income renter households in PDAs, TPAs, or high-opportunity areas that are at risk of displacement
Economic vitality	8.	Increase by 20% the share of jobs accessible within 30 minutes by auto or within 45 minutes by transit in congested conditions
	9.	Increase by 35% the number of jobs in predominantly middle-wage industries
	10.	Reduce per-capita delay on the Regional Freight Network by 20%
Transportation system effectiveness	11.	Increase non-auto mode share by 10%
	12.	Reduce vehicle operating and maintenance costs due to pavement conditions by 100%
	13.	Reduce per-rider transit delay due to aged infrastructure by 100%

Table 1: Plan Bay Area 2040 includes 13 outcome measures and targets.

1 U.S. Government Accountability Office, *DOT Is Progressing toward a Performance-Based Approach, but States and Grantees Report Potential Implementation Challenges* (2015), 1, www.gao.gov/products/GAO-15-217.

2 Metropolitan Transportation Commission, "Plan Bay Area 2040 Goals and Targets" (2015), www.planbayarea.org/2040-plan/plan-details/goals-and-targets.

References

The following references assess the effectiveness of transportation investments and offer general recommendations for doing better:

- Congressional Budget Office. *Approaches to Making Federal Highway Spending More Productive*. 2016. This report looks at making highway spending more productive by 1) charging drivers directly for road usage; 2) allocating spending to states based on costs and benefits of specific projects and programs; or 3) linking spending more closely with performance measures. www.cbo.gov/publication/50150.

- U.S. Public Interest Research Group. *Highway Boondoggles 2: More Wasted Money and America's Transportation Future*. 2016. This report looks at expensive highway projects. It recommends 1) investing in cheaper and more effective congestion solutions; 2) adopting fix-it-first policies; 3) prioritizing projects that reduce vehicle miles traveled; 4) analyzing the need for projects using recent data and up-to-date transportation models; 5) applying scrutiny to public private partnerships; 6) revising transportation forecasting models; and 7) investing in research and data collection. www.uspirg.org/reports/usp/highway-boondoggles-2. See also an earlier report, www.uspirgedfund.org/reports/usp/highway-boondoggles.

- U.S. Government Accountability Office. D*OT Is Progressing toward a Performance-Based Approach, but States and Grantees Report Potential Implementation Challenges*. 2015. This report describes challenges states face in implementing a performance-based approach in response to MAP-21. States lack the monitoring systems to track performance but U.S. DOT is working with states to share data, best practices and templates. www.gao.gov/products/GAO-15-217.

- Pew Center on the States & Rockefeller Foundation. *Measuring Transportation Investments: The Road to Results*. 2011. This report identifies which states have the essential tools in place to make more cost-effective transportation funding and policy choices. It recommends several policy options for making more cost-effective transportation decisions: 1) improve the information; 2) enact or improve performance measurement legislation; 3) develop an appropriations process that makes better use of data; 4) increase the use of cost-benefit and other types of economic analysis in making transportation decisions; 5) better connect goals, measures and plans; 6) track citizen feedback on transportation experience; and 7) improve intergovernmental and interagency coordination. www.pewtrusts.org/en/research-and-analysis/reports/0001/01/01/measuring-transportation-investments.

FRAMEWORK

Focus on outcomes in all four phases of decision-making

States, MPOs and local governments should make decisions using a four-phase outcomes-based cycle. This report offers eight sets of recommendations, summarized in Table 2, to improve on current practice and guidance. An outcomes-based approach offers many benefits.

Follow a four-phase outcomes-based approach

Fundamentally, outcomes-based decision-making is simple. We should measure what we value, and what we measure is what we expect to achieve with our investments. Many Americans are most interested in understanding what outcomes their transportation investments buy. See Figure 4. A more accountable and transparent approach focuses on what outcomes are achieved—at what cost.

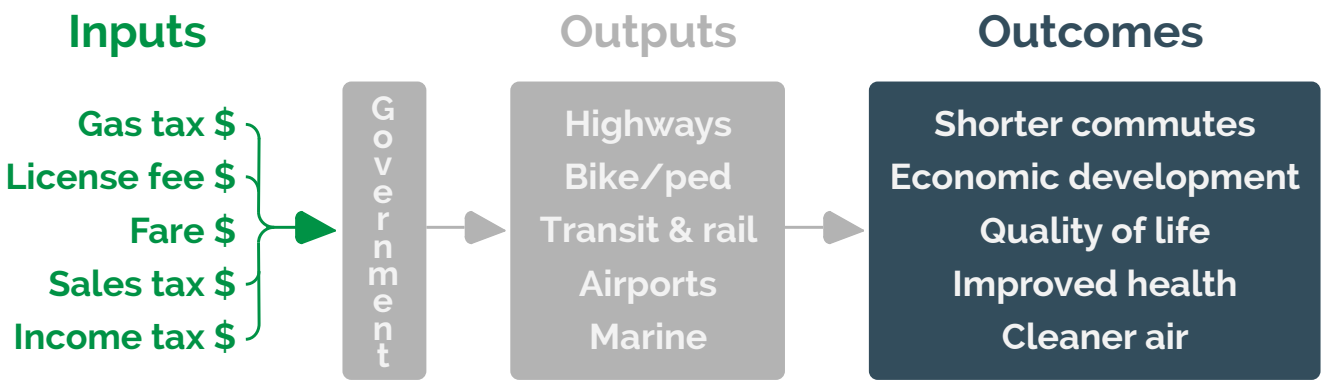


Figure 4: What does the public get for its investments in transportation?

The idea of outcomes-based decision-making is ubiquitous in the private sector. Companies set benchmarks: profits, sales, customers served, etc. They then measure what actually happens and use this information to adjust and improve performance. Typically, failure to achieve targets can have consequences, ranging from loss of pay to loss of a job to loss of shareholders.[1]

But in the public sector, transportation decision-making is complicated by a myriad of federal, state and local laws, rules and policies. Typically, there isn't a single decision to widen a highway, build a new light rail line, or fund a program to teach kids about safe routes to school: Transportation decision-making isn't like going to a supermarket and just choosing items off the shelf. Rather transportation decision-making generally involves multiple policymakers in charge of different agencies making different decisions at different times to advance different aims.

1 For example, see André de Waal. *Strategic Performance Management: A Managerial and Behavioral Approach* (New York: Palsgrave Macmillan, 2013).

Nevertheless, it is useful to think of transportation decisions being made in a cycle of four phases, as this paper is structured. States, MPOs and local governments should make decisions using this four-phase outcomes-based cycle:

1. **Planning**: What outcomes do we want? What investments will be effective?
2. **Governance & Finance**: What sources of money are available? How can it be used? Who decides how to use it?
3. **Programming**: What investments do we make?
4. **Reporting:** How did our investments perform? What do we tell the public?

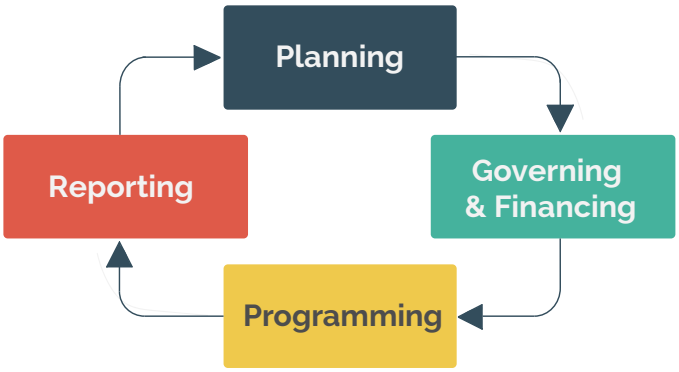


Figure 5: Our recommended four-phase outcomes-based approach to transportation decision-making.

Build on current practices and recommendations

Although transportation policymakers are adopting performance-based approaches, especially under MAP-21, progress is slow due to the complicated nature of transportation decision-making (as well as the slow pace of the federal rulemaking by USDOT that was initiated by MAP-21).

The recommendations in this report are not entirely new but rather build on and supplement good guidance from the U.S. Department of Transportation, which in turn builds on longstanding experiences with performance management in other fields.

In particular, our four-phase outcomes-based framework (Figure 5) closely follows the three-phase performance-based framework the Federal Highway Administration (FHWA) recommends (Figure 6).[1]

According to FHWA: "Performance-based planning and programming (PBPP) … includes development of: long-range transportation plans, other plans and processes … and programming documents, including state and metropolitan transportation improvement programs (STIPs and TIPs). PBPP attempts to ensure that transportation investment decisions are made—both in long-term planning and short-term programming of projects—based on their ability to meet established goals."[2]

The major difference is that our outcomes-based framework recognizes the importance of funding mechanisms: Where does funding come from? How can funding be used? Who decides and how? Guidance from FHWA and especially from MAP-21 largely overlooks the issue of funding and the constraints of those making transportation investment decisions. Selecting performance measures, setting targets and reporting progress are all good steps. But unless decision-makers have sufficient authority, flexibility and resources to

1 Federal Highway Administration, *Performance-Based Planning and Programming Guidebook* (2013), fig. 1, www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook/page02.cfm.
2 Federal Highway Administration, *Performance-Based Planning and Programming Guidebook* (2013), iii, www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook/page00.cfm#es.

make the most cost-effective investments, efforts to achieve those targets cost-effectively can be futile.

Moreover, current practice in the evaluation area is severely limited.

Finally, our outcomes-based framework focuses on results of importance to the public. The aim is for governments to be more accountable and transparent.

This report offers eight sets of recommendations, summarized in Table 2 on the following page, to improve on current practice and guidance.

Figure 6: FHWA recommends using a three-phase performance-based approach.

Phase	Federal Highway Administration performance-based approach	Four-phase outcomes-based approach
1. Planning	**Where do we want to go?** ➔ Develop goals and objectives ➔ Select performance measures **How are we going to get there?** ➔ Identify trends and targets ➔ Identify strategies and analyze alternatives ➔ Develop investment priorities in the long-range transportation plan (LRTP)	**What outcomes do we want?** ➔ Develop outcome measures that reflect local priorities **What investments will be effective?** ➔ Plan to achieve desired outcomes cost-effectively
2. Governance & Finance	*(No guidance)*	**What sources of money are available?** ➔ Tie sources of funding to desired outcomes **How can it be used?** ➔ Provide flexibility to make cost-effective investments **Who decides how to use it?** ➔ Delegate investment decisions to policymakers with sufficiently broad authority
3. Programming	**What will it take?** ➔ Implementation plan ➔ Resource allocation ➔ Program of projects	**What investments do we make?** ➔ Make cost-effective investments to achieve desired outcomes
4. Reporting	**How did we do?** ➔ Monitoring ➔ Evaluation ➔ Reporting	**How did our investments perform?** ➔ Analyze outcomes and adjust expectations **What do we tell the public?** ➔ Report returns on investments to taxpayers

Table 2: Our four-phase outcomes based approach builds on FHWA's three-phase approach.

Enjoy benefits by focusing on outcomes

By focusing attention on outcomes that matter to the public, transportation agencies can provide clarity on how it plans to achieve results and can build public support for needed resources.

As former **Pennsylvania** Secretary of Transportation Al Biehler explained: "Many states have come to this same conclusion: departments of transportation (DOTs) must change their strategic approach to make smarter investments, to wring more and better performance out of their existing systems, and to critically evaluate the full range of possible future investments. We must focus on those projects that do the most good for the least money. Through our demonstrated ingenuity and accountability, we must build the trust of our constituents to provide funding levels that meet the transportation needs of our future economies and communities. Accomplishing such a lofty goal starts with adopting innovative solutions and staying up-to-date about best practices nationally."[1]

Focusing on outcomes also helps direct investments cost-effectively to better achieve public goals, for example, to increase safety, improve health, provide better transportation choices, enhance economic competitiveness, reduce the cost of living, support communities, and protect the environment in line with public priorities. Rather than focusing on the stand-alone benefits of a specific project, an outcomes-based approach calls on policymakers to assess potential investments based on anticipated system-wide impacts and support for goals.

Finally, whereas the private sector often pursues only a single bottom line, governments must pursue multiple public goals. Sometimes these goals conflict with each other, forcing policymakers to set priorities among them. An outcomes-based approach includes clear and open discussions about what the public desires and the strategic direction an agency should take. Furthermore, an outcomes-based approach focuses attention on challenges and opportunities for achieving desired outcomes, regardless of which transportation or non-transportation agency might be most responsible.

1 Smart Growth America & State Smart Transportation Initiative, *The Innovative DOT: A Handbook of Policy and Practice*, 3rd ed. (2015), 3, http://smartgrowthamerica.org/resources/the-innovative-dot-2015/.

References

This report builds on especially federal guidance on performance-based transportation decision-making:

- Federal Highway Administration. *Performance-Based Planning and Programming Guidebook*. 2013. This guidebook highlights effective practices to help transportation agencies move toward a performance-based approach to planning and programming. www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook.

The following references detail current transportation decision-making practices and offer additional guidance on adopting performance-based approaches:

- Federal Highway Administration & Federal Transit Administration. *A Guide to Transportation Decisionmaking*. 2015. This guide discusses the federally required process for transportation decision-making. www.planning.dot.gov/documents/GuidetoTransportationDecisionmaking.pdf.

- Federal Highway Administration & Federal Transit Administration. *The Transportation Planning Process: Key Issues. A Briefing Book for Transportation Decisionmakers, Officials, and Staff*. 2015. This book provides an overview of transportation planning and will be useful for government officials, transportation decision-makers, planning board members, transportation service providers, interested stakeholders, and the public. www.fhwa.dot.gov/planning/publications/briefing_book.

- Federal Highway Administration. *Linking Transportation Performance and Accountability*. Prepared by American Trade Initiatives. 2010. This study scans how transportation agencies in other countries apply performance management programs. http://international.fhwa.dot.gov/pubs/pl10011/.

- U.S. Department of Transportation. *The Changing Face of Transportation*. Washington, D.C.: Bureau of Transportation Statistics, 2000. This report reviews the major transportation policy milestones of the last 25 years of the 20th Century, the social and economic context for those milestones, and looks ahead to the year 2025. http://apps.bts.gov/publications/the_changing_face_of_transportation/.

- U.S. Department of Transportation. *Transportation Decision Making: Policy Architecture for the 21st Century*. 2000. Changes detailed in The Changing Face of Transportation demand new tools, new competencies, new alliances—in short, a new transportation policy architecture. This report offers an overarching set of principles to encourage more open, collaborative, and flexible decision-making across the transportation enterprise. It will allow all parts of the enterprise—international, federal, state, regional, local, and private—to make more effective decisions. http://ntl.bts.gov/lib/12000/12300/12331/PolArch.pdf.

Phase 1: Planning

What outcomes do we want? What investments will be effective?

Planning is critical to ensuring transportation investments deliver desired results to the public.

FHWA provides excellent guidance on the planning phase: developing goals and objectives, selecting performance measures, identifying trends and targets, identifying strategies and analyzing alternatives, and developing investment priorities in the long-range transportation plan. This part builds on their guidance.

To deliver the results the public wants, think outside the box. Think beyond outputs: roads, bridges, tunnels, transit, rail, ports, etc. Think about the outcomes that transportation infrastructure is meant to achieve: improved access to destinations, more jobs, better active transportation options, etc. Analyze the overall transportation system—including not only transportation facilities and services, but also the economic activity that generates trips and the pricing that influences how people and business use the transportation system—in order to develop a cost-effective plan of action to achieve desired outcomes.

But responsibility for planning is distributed. There is no comprehensive national transportation plan. Under America's federal system, the U.S. DOT mostly delegates planning responsibilities to state DOTs, and in urban areas also to MPOs. Moreover, cities, counties, transit agencies, ports, and other transportation service providers also play parts in transportation planning.

In theory, these different actors are supposed to undertake a planning process that is "continuing, cooperative, and comprehensive to the degree appropriate."[1] In practice, jurisdictions are generally constrained by their geographic boundaries, the facilities and services for which they are responsible, the funding they control, and the interests of their constituents.

Building on FHWA guidance, the planning phase includes these recommended steps that are detailed in the following two sections below:

- ➔ **Develop outcomes measures that reflect local priorities**
- ➔ **Plan to achieve desired outcomes cost-effectively**

1 23 U.S.C. § 135(a)(3), § 134(c)(3).

Develop outcomes measures that reflect local priorities

"If you don't know where you want to go, you will probably end up somewhere else."

To articulate what outcomes the public desires, develop goals, objectives and performance measures. FHWA provides excellent guidance on developing goals and objectives, and selecting performance measures. This section builds on their guidance.

- *Understand what the public values*

Work to understand in practical terms what the public values: what sort of "bang for the buck" they are willing to pay for.

Think beyond traditional transportation goals of safety, mobility, accessibility and system condition to include elements of the real world affected by the transportation system. Consider goals drawn from triple bottom line: the "Three P's" of profit (or prosperity), people and planet, or sometimes the "Three E's" of economy, (social) equity, and environment.[1]

Example: Tennessee adopts guiding principles embodying the "Three P's / E's"

Tennessee's 25-year long-range transportation policy plan includes seven guiding principles: 1) preserve and manage the existing system; 2) support the state's economy; 3) maximize safety and security; 4) provide for the efficient movement of people and freight; 5) build partnerships for sustainable and livable communities; 6) protect natural, cultural, and environmental resources; and 7) emphasize financial responsibility. These goals focus on things that matter and reflect the "Three P's / E's." Learn more: www.tn.gov/tdot/section/25-year-transportation-plan.

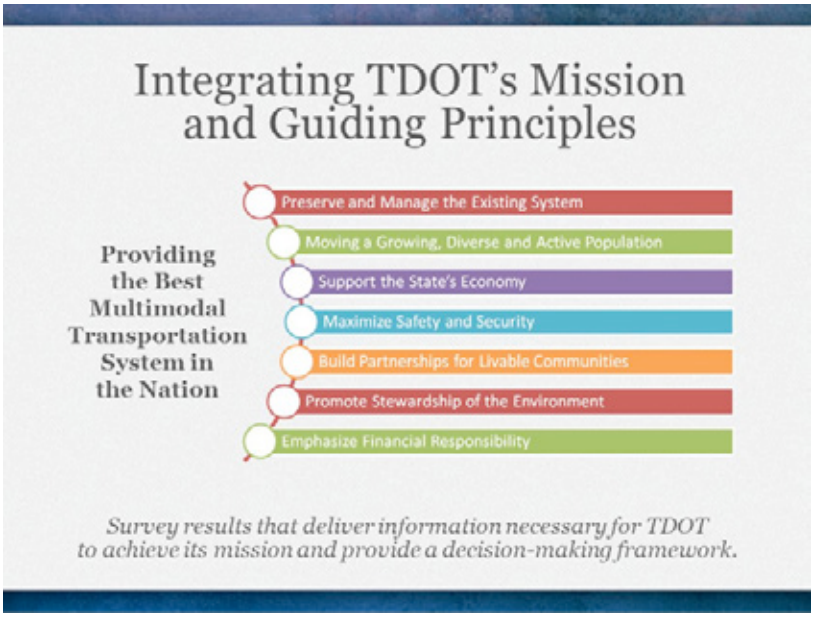


Figure 7: Tennessee DOT's mission & guiding principles reflect the "Three P's / E's"

1 The phrase " triple bottom line" was first coined in 1994 by John Elkington, the founder of a British consultancy called SustainAbility. See "Triple bottom line," *Economist*, Nov. 17, 2009, www.economist.com/node/14301663.

- *Measure what matters*

That which is measured is what gets done.

To quantify goals, develop a small number of meaningful objectives and performance measures.

It is easy enough to adopt lofty general goals, for example, mobility, economic development, environmental protections, safety, etc. The challenge is to determine what objectives and which outcome measures faithfully capture what really matters to the public.

As we will see below in the reporting phase, performance measures are useful only if you can establish a cause and effect relationship with investments. Consider organizing goals, objectives and performance measures into an objectives tree, as shown in Figure 8.[1]

The references below include specific recommendations for performance measures, including those reflecting sustainability and livability that go beyond traditional transportation measures.

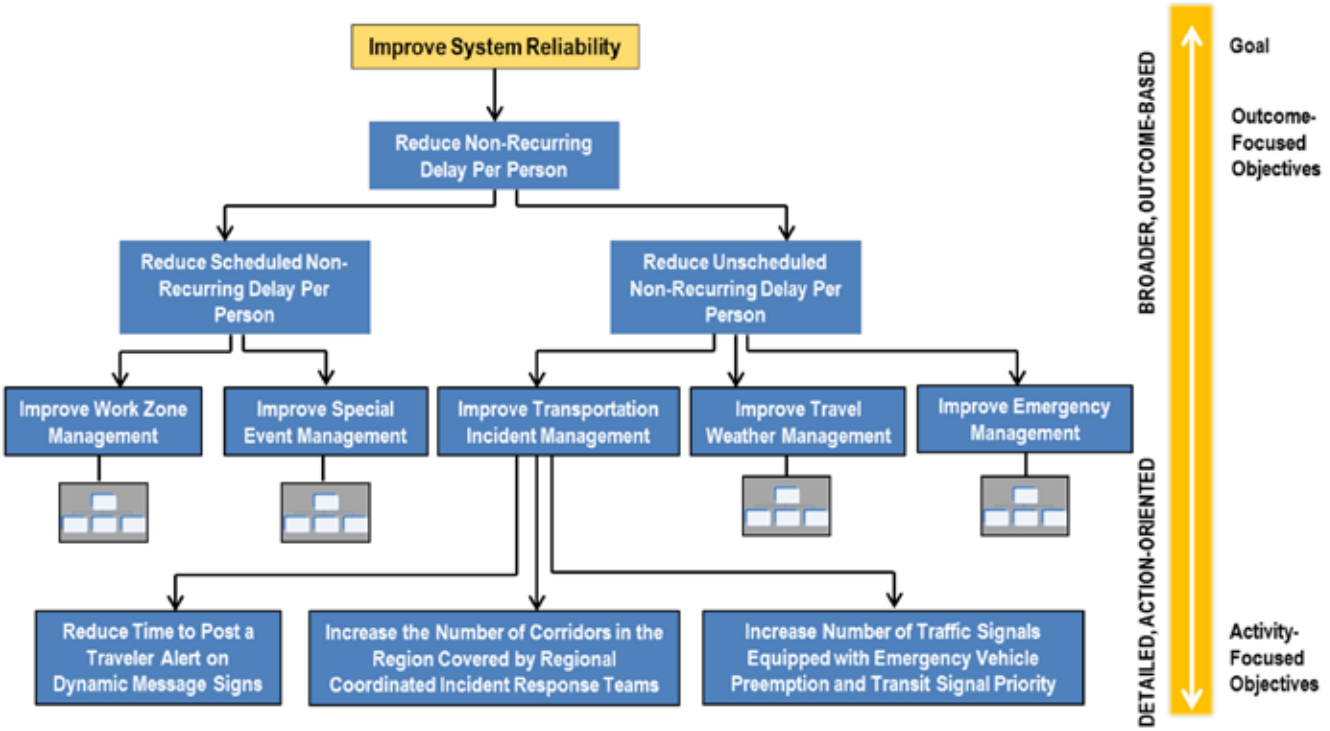


Figure 8: Consider organizing goals, objectives and performance measures into an objectives tree.

1 Federal Highway Administration. *Performance-Based Planning and Programming Guidebook* (2013), fig. 3, www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook.

Example: California develops alternative to level of service standard

Using level of service (LOS) standards, transportation engineers measure current and projected conditions for vehicles, and use those ratings to define the scope or design of a project. Because this limited measure accounts only for the movement of vehicles, in the case of roads and intersections with vehicle delay exceeding engineering standards, it requires transportation agencies to expand roads as a one-size-fits-all solution. In **California**, advocates and elected officials have long cited these LOS standards as inadequate and far too narrow for making necessary multimodal transportation decisions. Because of the emphasis on vehicle delay, dense infill development is difficult to approve under California environmental review standards. Thus, California was using a performance standard of vehicle delay, but not getting the desired outcomes. In 2013, the state legislature passed Senate Bill 743, requiring the state Office of Planning and Research to publish guidelines on shifting from a LOS standard to a vehicle-miles-traveled (VMT) standard. Released in 2016, the new guideline relies on VMT as the primary metric for transportation impact across the state. Thus, California offers an example of shifting the performance metric to serve a different policy end. Learn more: www.opr.ca.gov/ceqa/updates/sb-743/.

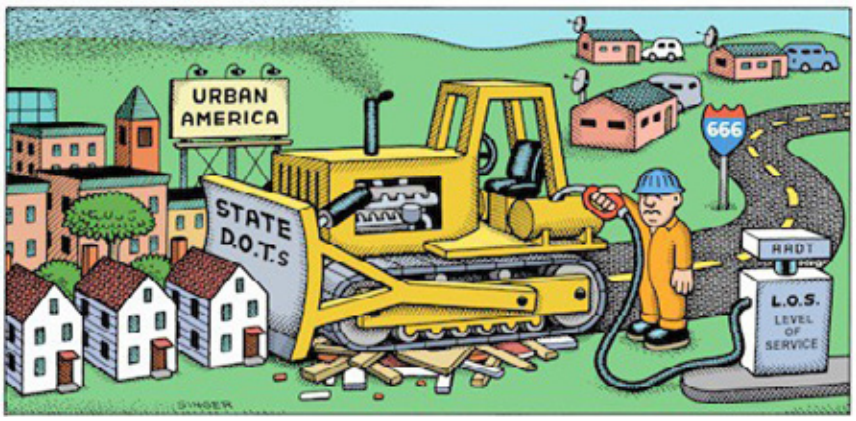


Figure 9: There is no national requirement or mandate to apply LOS standards and targets 20 years into the future for urban streets. Credit: Andy Singer.

- *Set clear priorities*

Whereas the private sector often pursues only a single bottom line, governments must pursue multiple public goals. Sometimes these goals conflict with each other, forcing policymakers to set priorities. An outcomes-based approach includes clear and open discussions about what the public desires and the strategic direction an agency plans to take.

Often a transportation agency sets multiple goals with a general idea of "balancing" them. But when goals conflict or when there are insufficient resources, not all goals can be fully achieved. Sometimes the result is that some goals receive much attention and funding while other are paid mostly lip service. It is fine to not be able to accomplish everything, but it is misleading to suggest you will pursue many goals but then end up pursuing only some. By setting clear priorities, transportation agencies and stakeholders can ensure that the investment decisions of only a few speak for the priorities of many. An outcomes-based approach requires coming to grips with what is truly important or actually realistic to achieve.

Transportation agencies also often talk about needs—"there is a congestion bottleneck at this interchange that needs to be fixed"—as if needs necessarily translate into priorities, without regard to the broader public goal—reduced travel time—or if the project is the most cost-effective solution to achieve that end goal.

The Congressional Budget Office cautions: "Using performance measures to guide spending does not always yield the same results as benefit-cost analyses. In some instances, benefit-cost analysis would suggest constraining spending for parts of the highway system with poorer performance, whereas needing to meet a performance measure could suggest the opposite—increasing spending for those parts of the highway system."[1] For example, if you decide that one important performance measure is volume-to-capacity ratio and set a target of 0.75, you can go broke chasing that benchmark while many other more cost-effective potential investments go unfunded.

Set clear priorities for investments in line with the public's. Which goals take precedence? How much is the public willing to pay to achieve certain outcomes?

Example: Oregon promotes safety over mobility for highways that are main streets

State highways are often intended for speed and moving freight efficiently. Main streets are often places where people work, shop, eat, and play. When a state highway is also a main street, there is a conflict between the two uses. **Oregon** developed a guide for facing these conflicts directly. Learn more: www.oregon.gov/LCD/TGM/docs/mainstreet.pdf.

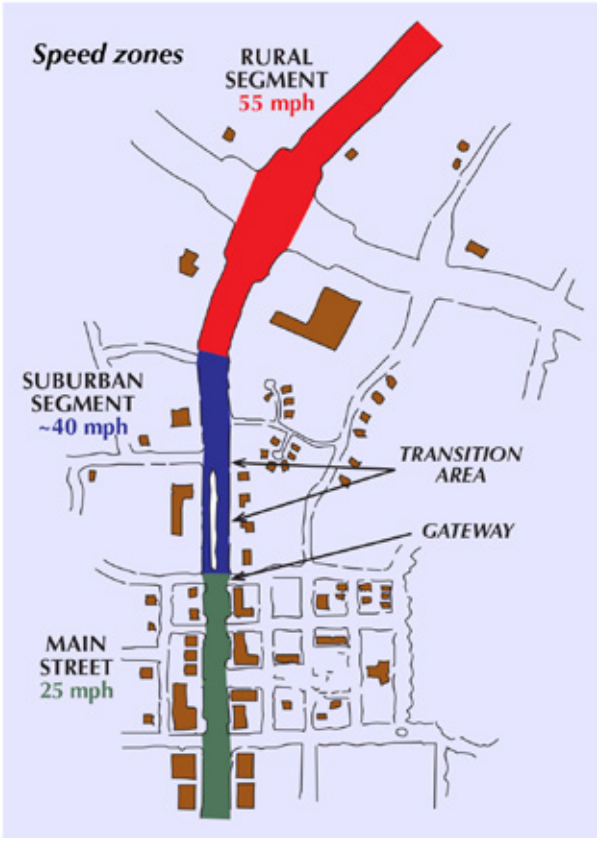


Figure 10: Oregon recognizes different zones when a highway becomes a community's main street.

1 Congressional Budget Office, *Approaches to Making Federal Highway Spending More Productive* (2016), 3, www.cbo.gov/publication/50150.

References

This report builds on especially federal guidance on performance-based transportation decision-making:

- Federal Highway Administration. *Performance-Based Planning and Programming Guidebook*. 2013. See especially § 3 (Develop Goals and Objectives) and § 4 (Select Performance Measures). www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook.

The following references offer more guidance on developing goals, objectives, performance measures and targets.

- Transportation Research Board. *"Performance Measurement Framework for Highway Capacity Decision Making."* 2017. This web resource is helps practitioners select performance measures to support the evaluation of major highway capacity projects. This resource allows practitioners to look at individual planning factors and generate a report with performance measures that are relevant to the highway capacity project. http://shrp2webtool.camsys.com.

- Transportation for America. *Measuring What We Value: How MPOs Are Prioritizing Health*. 2016. This package of case studies, produced in partnership with the American Public Health Association, showcases a range of strategies that metropolitan area planning agencies can use to strengthen the local economy, improve public health outcomes for all of their residents, promote social equity, and better protect the environment. http://t4america.org/maps-tools/mpo-case-studies.

- Transportation for America. *Measuring What We Value: Setting Priorities and Evaluating Success in Transportation*. 2015. This report and recommended framework look at innovative DOTs and MPOs that have had early success in measuring the performance of their transportation systems and in investing to get the best bang for the buck. They also recommend goals and measures for following these examples. http://t4america.org/maps-tools/performance-measures-report.

- Environmental Protection Agency. *Guide to Sustainable Transportation Performance Measures*. 2011. This guide describes opportunities to incorporate environmental, economic, and social sustainability into transportation decision-making through the use of performance measures. www.epa.gov/smartgrowth/guide-sustainable-transportation-performance-measures.

Plan to achieve desired outcomes cost-effectively

"Failing to plan is planning to fail."

A plan includes investments intended to achieve desired outcomes. FHWA provides excellent guidance on developing transportation plans: identifying trends and targets, identifying strategies and analyzing alternatives, and developing investment priorities. This section builds on their guidance.

- *Evaluate a broad range of potential investments*

Evaluate a broad range of potential investments, including non-transportation investments, to identify the most cost-effective solution.

The transportation system is clearly affected by origins and destinations—"trip generators"—including residences, businesses, industries, schools, and parks. Land use changes impact the transportation system. For example, a decision to site a new school near transit, even if more expensive in the short term, could save far more in transportation costs in the long term. Moreover, the transportation system is also affected by demographics, which influences what sort of people want to travel how, and by economic conditions that influence what transportation choices people make based on income levels and prices. A robust set of potential investments needs to encompass many non-transportation investments that affect the transportation system.

Figure 11: New Jersey & Pennsylvania recognize the transportation and land use cycle.

Example: New Jersey and Pennsylvania pursue "smart transportation"

New Jersey and **Pennsylvania** cannot solve congestion by building more or wider state roadways. There will never be enough financial resources to supply the endless demand for roadway capacity. Further, both states realize that the "more and wider" approach to road construction cannot ultimately solve the problem. Sprawling land uses are creating congestion faster than roadway capacity can be increased. The concept of 'smart transportation' proposes to manage transportation system capacity by better integrating land use and transportation planning.[1] The desire to go "through" a place must be balanced with the desire to go "to" a place. Roadways have many purposes, including providing local and regional mobility, offering access to homes and businesses, and supporting economic growth. Learn more: www.state.nj.us/transportation/community/mobility/pdf/smarttransportationguidebook2008.pdf. See also: www.ssti.us/2011/10/penndot-smart-transportation-review.

1 New Jersey Department of Transportation & Pennsylvania Department of Transportation, *Smart Transportation Guidebook: Planning and Designing Highways and Streets That Support Sustainable and Livable Communities* (2008), fig. 1.1, www.state.nj.us/transportation/community/mobility/pdf/smarttransportationguidebook2008.pdf.

- *Plan for a limited budget*

Transportation funding five, 10 or 20 years into the future is typically uncertain. Indeed, it is sometimes hard to know just years or even months in advance whether a transportation funding package will pass, hence if there will be revenues to invest in transportation.

Unfortunately, the lack of predictability in transportation revenue streams tends to encourage planning without regards to cost. Typically, planners identify a problem in the transportation system and design a solution. Without sufficient regards to cost, the result is often a large project for which funding isn't immediately available. But once on the books, such projects become viewed as "needs," sometimes for decades until they are built.

A more cost-effective approach would be to plan for a fixed budget and then to determine what package of investments would most cost-effectively deliver desired outcomes.

- *Develop scenarios*

Since 2004, FHWA has encouraged transportation-focused scenario planning as an approach that enhances the traditional planning process. Scenario planning provides a framework for developing a shared vision for the future by analyzing various forces—health, transportation, economic, environmental, land use, etc.—that affect communities. The technique was originally used by private industry to anticipate future business conditions and to better manage risk.

Targets should not be set in isolation, but rather as part of developing long-range plans by analyzing conditions, trends, and the costs of achieving different outcomes.

Figure 12: Plan Bay Area 2040 estimates which performance targets will be achieved.

Example: San Francisco's Plan Bay Area 2040 adopts preferred scenario

For example, **California's** Senate Bill 375 requires all 18 MPOs to do "blueprint planning"—scenario planning—to create a Sustainable Communities Strategy to achieve, among other goals, a reduction in greenhouse gas emissions. Such planning looks at both transportation and land use. Plan Bay Area 2040 includes 10 goals and 13 performance targets. The final preferred scenario recently adopted by the Metropolitan Transportation Commission (MTC) is projected to achieve some performance targets but not others.[1] Learn more: http://mtc.ca.gov/our-work/plans-projects/plan-bay-area-2040.

1 Metropolitan Transportation Commission, "Plan Bay Area 2040 Final Preferred Scenario Approved: Performance," Dec. 16, 2016, http://mtc.ca.gov/whats-happening/news/special-features/performance.

- *Plan for uncertainty*

A major challenge of transportation planning is "known unknowns": uncertainties that are recognized but that can't necessarily be controlled.

To plan, models are used to predict the outcomes of various actions. In theory, one simply selects the actions that yield the desired outcomes—for the least cost. In practice, planning is prone to uncertainty.
Over two decades ago, **Florida** observed: "It's tough to tell the future. Analyzing historical and current trends to forecast conditions 20 or more years into the future has been compared to throwing darts at a moving board under a strobe light. The dynamic nature of social, economic, and political activities in the United States … creates too many uncertainties for foolproof forecasting."[1]

A recent study of the 50-year history of travel demand forecasting models reports: "The likely inaccuracy in the 20-year forecast of major road projects is ±30% at minimum, with some estimates as high as ±40-50% over even shorter time horizons. There is a significant tendency to overestimate traffic and underestimate costs, particularly for toll roads. Forecasts of transit costs and ridership are even more uncertain and also significantly optimistic."[2]

"Current models tend to be biased in various ways."[3] Part of the challenge is technical: More sophisticated models could provide more accurate predictions. But part of the challenge is fundamental: It is difficult to predict that which isn't controlled—"external" factors such as land use changers, socio-economic developments, and the emergence of new travel technologies.

Rather than pretend that uncertainty can be eliminated, robust plans should embrace uncertainty, testing scenarios for what would happen if predictions proved to be wrong.

1 Edward A. Mierzejewski, *A New Strategic Urban Transportation Planning Process* (1995), 7, https://ntl.bts.gov/lib/6000/6700/6721/844.pdf.
2 David T. Hartgen, "Hubris or humility? Accuracy issues for the next 50 years of travel demand modeling," *Transportation* 40 (Nov. 2013): 1133–1157, http://link.springer.com/article/10.1007/s11116-013-9497-y, www.hartgengroup.net/Projects/National/USA/hubris_humility/2013-08-28_FINAL_PAPER_OnLine%20Transportation_40.6_Sept_2013.pdf.
3 Victoria Transport Policy Institute, "Transport Model Improvements: Improving Methods for Evaluating The Effects and Value of Transportation System Changes," last modified Feb. 27, 2017, www.vtpi.org/tdm/tdm125.htm.

Example: New Zealand asks how the transportation system could evolve

In 2014, the **New Zealand** Ministry of Transport asked: How could or should the transportation system evolve in order to support mobility through 2042?[1] A scenario planning exercise identified key drivers of change, categorized as Social, Technological, Economic, Environmental and Political (STEEP); shortlisted these drivers according to how certain they were and how important they were to the focal question; and identified candidate pairs of "critical uncertainties" to define a two-by-two scenario matrix. Uncertainties were tested against criteria that included: exclusivity with other drivers; factors the Ministry had little control over; and factors that had resonance with national and international debate over major issues facing society. Final selection of the preferred pair of critical uncertainties was also guided by two key unknowns: what society will want to do in the future and what society will be able to afford to do in the future. Learn more: www.transport.govt.nz/ourwork/keystrategiesandplans/strategic-policy-programme/future-demand/.

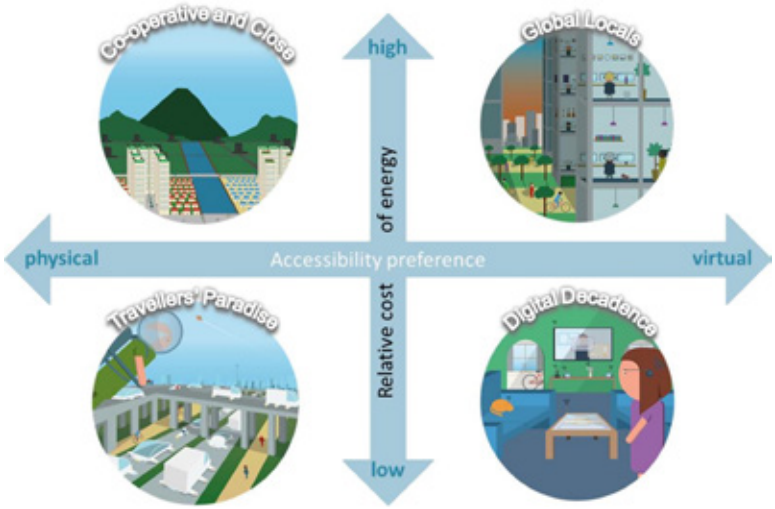


Figure 13: New Zealand developed four plausible future scenarios for 2042.

Example: AASHTO explores socio-demographic changes over the next 30 to 50 years

The American Association of State Highway and Transportation Officials established the NCHRP Project 20-83 research series to examine global and domestic long-range strategic issues and their implications for DOTs to help prepare the DOTs for the challenges and benefits created by these trends.[2] The sixth report in this series presents the results of research on how socio-demographic changes over the next 30 to 50 years will impact travel demand at the regional level. Learn more: www.trb.org/Publications/Blurbs/171200.aspx.

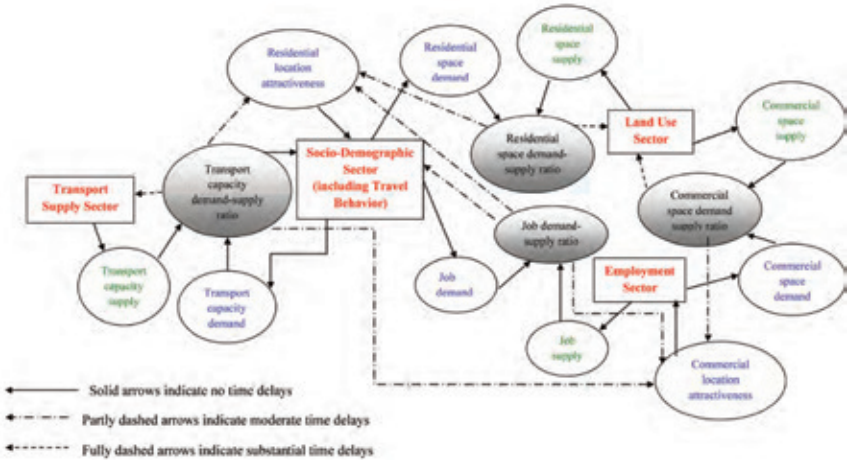


Figure 14: AASHTO studied the overall relationships between the socio-demographic model sectors.

1 Glenn Lyons & Cody Davidson, "Guidance for transport planning and policymaking in the face of an uncertain future," Transportation Research Part A: Policy and Practice 88 (June 2016): 104–116, www.sciencedirect.com/science/article/pii/S0965856416302555.

2 Johanna P. Zmud, et al., *The Effects of Socio-Demographics on Future Travel Demand*, vol. 6 of *NCHRP Report 750: Strategic Issues Facing Transportation* (Transportation Research Board, 2014), fig. 6-1, www.trb.org/Main/Blurbs/171200.aspx.

References

This report builds on especially federal guidance on performance-based transportation decision-making:

- Federal Highway Administration. Performance-Based Planning and Programming Guidebook. 2013. See especially § 5 (Identify Trends and Targets), § 6 (Identify Strategies and Analyze Alternatives), and § 7 (Develop Investment Priorities in the LRTP). www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook.

The following references offer more guidance on developing plans:

- Federal Highway Administration. *Supporting Performance-Based Planning and Programming through Scenario Planning*. 2016. This guidebook explains how scenario planning can be used to support and advance the practice of performance-based planning and programming. www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/scenario_planning_guidebook.

- Federal Highway Administration. *Model Long-Range Transportation Plans: A Guide for Incorporating Performance-Based Planning*. 2014. This guidebook explains how to incorporating performance-based planning into the development of a long-range transportation plan. www.fhwa.dot.gov/planning/performance_based_planning/mlrtp_guidebook.

- Federal Highway Administration. *FHWA Scenario Planning Guidebook*. 2011. This guidebook explains a scenario planning process from start to finish. www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/scenario_planning_guidebook_2011.

- Federal Highway Administration & Federal Transit Administration. *Livability in Transportation Guidebook: Planning Approaches that Promote Livability*. 2010. This guidebook illustrates how livability principles have been incorporated into transportation planning, programming, and project design, using examples from State, regional, and local sponsors. www.fhwa.dot.gov/livability/case_studies/guidebook.

Phase 2: Governance & Finance

What sources of money are available? How can it be used? Who decides how to use it?

Funding is critical to ensuring transportation investments deliver desired results to the public. The issue of funding and the responsibilities of those making transportation investment decisions is largely overlooked in current guidance.

The governance & finance phase includes decisions on sources of funding: taxes and fees. It also includes decisions on how funding can be used. General funding can be used for most purposes while dedicated funding can be used only for specific purposes, such as roadway improvements. Finally, the governance & finance phase includes allocating funding to the decision-makers that are charged with selecting which specific investments to make.

If it is true that what is measured is what gets done, then it is even more true that what has funding is what gets done. As our research found, legal and political limits both on how funding can be used and on who decides what projects to fund can hinder efforts to make cost-effective investments to achieve desired outcomes.

A key issue is: What can a particular source of funding be used for? In particular, many states limit the use of gas tax revenues to just transportation projects or even more narrowly to just roadway projects. Such constraints are often well-intentioned efforts to provide the public with certainty that their taxes are being used as desired.

A related issue is: Who ultimately selects which investments to make? For example, a transit agency might not have the authority to invest in and operate a bike share system that would improve transit service by providing first / last mile connections. For example, a MPO might not have the authority to help pay to site a new school near transit, even if doing so would reduce the need for the MPO to invest in transportation in the future.

Constraints, whether on what or who, can frustrate efforts to make the most cost-effective investments. The governance & finance phase includes these recommended steps detailed in the following sections below:

- ➔ **Tie sources of funding to desired outcomes.**
- ➔ **Provide flexibility to make cost-effective investments.**
- ➔ **Delegate investment decisions to policymakers with sufficiently broad authority.**

Tie sources of funding to desired outcomes

"The art of taxation consists of plucking the goose so as to obtain the most feathers with the least hissing."
- Jean-Baptiste Colbert

"I like to pay taxes. With them, I buy civilization."
- Oliver Wendell Holmes Jr.

Nobody likes to pay taxes and fees. But without them, transportation investments are impossible. Current guidance on performance-based planning and programming is generally silent on making decisions on sources of funding. But an outcomes-based approach must include a commitment to the public that their taxes will be used to achieve desired outcomes. Moreover, inefficient sources of funding can undermine otherwise efficient investments.

- *Raise revenues to achieve desired outcomes*

The question of who pays is the flip side of the question of who benefits. An outcomes-based approach looks at both sides of the equation. Taxpayers will support taxes only so long as they believe the benefits justify the costs. In the short term, proposed new taxes should make clear to taxpayers what outcomes those taxes will buy—in terms that are meaningful. In the long term, when transportation agencies increase taxpayers' understanding of how funding will be used, taxpayers' are more likely to support measures to increase transportation revenues.

Example: Massachusetts works to earn taxpayers' support

To build support for new transportation revenues, **Massachusetts** promised taxpayers greater accountability by reforming its project selection process at the same time.[1] The 2013 Transportation Finance Law raised transportation funding and created a new process for selecting projects that relies on measurable criteria to score, rank and prioritize them. Learn more: www.mass.gov/bb/h1/fy15h1/prnt_15/exec_15/pbudbrief7.htm.

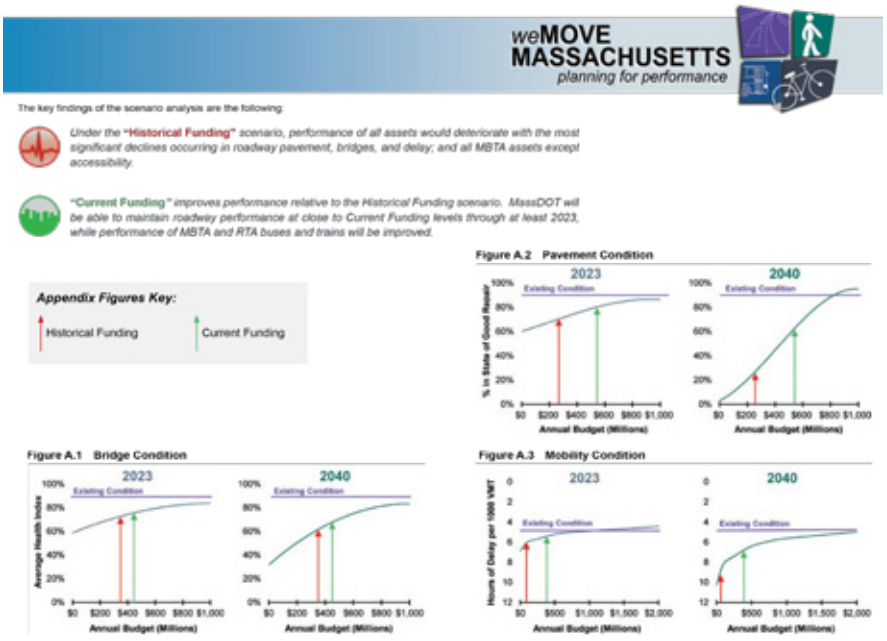


Figure 15: weMove Massachusetts estimated outcomes for different transportation investment levels

1 MassDOT, *weMove Massachusetts: Planning for Performance* (2014), http://www.massdot.state.ma.us/Portals/22/Docs/WMM_Planning_for_Performance.pdf.

- *Adopt funding mechanisms that incentivize desired outcomes*

Taxes and fees aren't merely sources of funding, but also actions that create incentives and disincentives that impact the transportation system.

In economics, the Law of Demand states: All else being equal, as the price of a product increases the demand decreases, and as the price decreases the demand increases.

Shifting taxes and fees away from users of the transportation system reduces marginal prices and thus increases demand. For example, shifting the tax burden from gas taxes to general sales taxes makes driving relatively cheaper, and thus increases congestion. For example, relying primarily on gas taxes encourages the use of electric vehicles that reduce emissions, but does little to discourage more driving that leads to greater traffic congestion.

Example: Oregon Road User Fee Program

Oregon recently piloted a mileage-based fee system as an alternative to a standard per-gallon fuel tax, in a system called OReGO. The device generated an electronic receipt using global positioning system (GPS) signals that were sent to specially-equipped gas pumps when the vehicles were refueled. At the pump, the standard fuel tax was deducted from the amount owed by the driver, and the owed mileage-based fees were added back. In the end, the test demonstrated that mileage fees were effective for collecting revenues without eroding fuel efficiency and that the system was relatively easy to administer. Although Oregon has yet to put such a program into effect, the technology could support pricing that incentivizes desired outcomes and support more cost-effective investments. Learn more: www.oregon.gov/ODOT/Programs/Pages/OReGO.aspx.

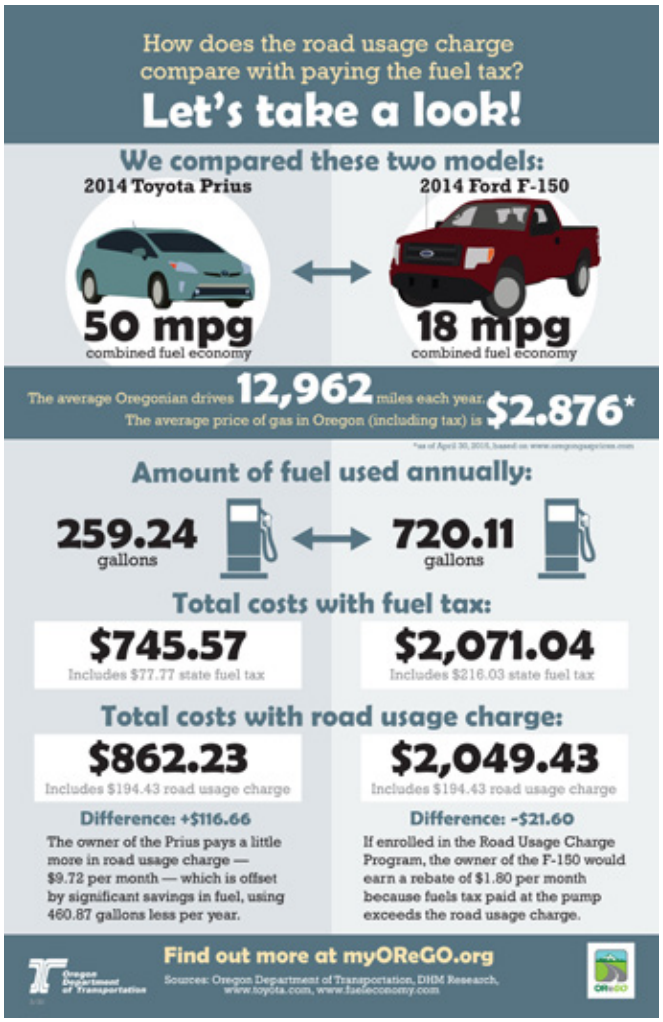


Figure 16: Oregon is promoting a road usage fee to price transportation more efficiently.

References

The following references offer more guidance on tying sources of funding to desired outcomes:

- Transportation for America. *Capital Ideas II: State Transportation Funding Lessons From 2015—Challenges for 2016*. 2015. The first half of this report summarizes 2015 efforts by 26 states—12 of which were successful—to pass bills to raise new transportation funding. The second half examines specific funding proposals closely on their merits. http://t4america.org/maps-tools/state-transportation-funding/capital-ideas-2/.

- Transportation for America. *Capital Ideas: Winning State Funding for Transportation—Lessons from Recent Successes*. 2015. This report highlights critical factors common to many state efforts to put transportation funding on sound footing and closely examines several successful campaigns. http://t4america.org/maps-tools/state-transportation-funding/2015-report/.

- National Governors Association. *Innovative State Transportation Funding and Financing: Policy Options for States*. 2009. This paper (1) provides case studies of state and international experience with a full range of policy options, (2) addresses new options that have emerged, (3) summarizes new developments in public private partnerships (PPPs), and (4) details financing options, such as congestion pricing, which establish a price signal to users that can both raise revenue and encourage more efficient use of the transportation infrastructure. www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-eet-publications/col2-content/main-content-list/innovative-state-transportation.html.

Provide flexibility to make cost-effective investments

Constraining what funds can be used for, whether by jurisdiction or mode, makes it harder to invest in the most cost-effective projects.

Scientists love to tell this joke:

> *Late at night, a police officer finds a drunk man crawling around on his hands and knees under a streetlight. The drunk man tells the officer he's looking for his wallet. When the officer asks if he's sure this is where he dropped the wallet, the man replies that he thinks he more likely dropped it across the street. Then why are you looking over here? the befuddled officer asks. Because the light's better here, explains the drunk man.*[1]

If like the streetlight, funding is available for only some kinds of investments, the most cost-effective ones might actually lie outside the funding constraints. Thus it makes sense to provide sufficient flexibility to enable funding to go to the most cost-effective investments.

- *Provide flexibility for funding across jurisdictions*

"Nearly every state distributes a portion of its fuel taxes or other state transportation revenues to counties or municipalities according to statutory formulas that are based on each jurisdiction's population, road miles, land area, number of registered vehicles, or other criteria. … State legislatures have also appropriated funds to localities for specific purposes, including local matches for Federal projects, and a number of state DOTs award discretionary grants for project costs."[2]

Such an approach ensures that each jurisdiction receives its "fair share" of tax dollars.

But ultimately the public is more interested in seeing that tax dollars do the most good to advance desired outcomes—regardless of jurisdiction.

To ensure transportation investments have the greatest impact on common public goals, allow more funding to be used across jurisdictions, aiming to invest in the most cost-effective projects.

1 David H. Freedman, "Why Scientific Studies Are So Often Wrong: The Streetlight Effect," Discover Magazine, Dec. 10, 2010, http://discovermagazine.com/2010/jul-aug/29-why-scientific-studies-often-wrong-streetlight-effect.

2 American Association of State Highway and Transportation Officials, *Transportation Governance and Finance: A 50-State Review of State Legislatures and Departments of Transportation* (2016), 78, www.financingtransportation.org/pdf/50_state_review_nov16.pdf.

Example: Oregon All Roads Transportation Safety (ARTS)

The All Roads Transportation Safety (ARTS) program addresses safety needs on all public roads in **Oregon**—regardless of jurisdiction. By working collaboratively with local road jurisdictions (cities, counties, MPOs and tribes), ODOT expects to increase awareness of safety on all roads, promote best practices for infrastructure safety, compliment behavioral safety efforts, and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program is data-driven to achieve the greatest benefits in crash reduction, directing federal Highway Safety Improvement Program (HSIP) funding to the projects with the greatest benefits. Learn more: www.oregon.gov/ODOT/Engineering/Pages/ARTS.aspx.

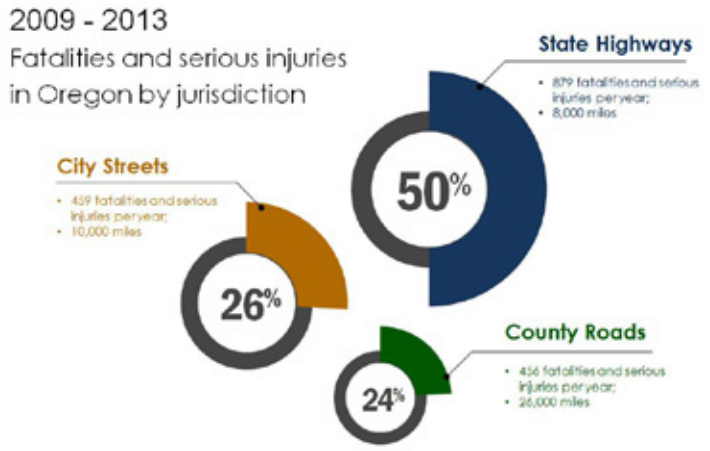


Figure 17: Oregon is directing safety funding to where it does the most good, regardless of jurisdiction.

- *Provide flexibility for funding across modes*

According to a recent AASHTO report, nearly all states have laws that restrict the use of gas taxes and other transportation-related revenues for transportation. Roughly half of states restrict the use of fuel taxes for roads and bridges only, while the rest allow the funds to be used for transportation more broadly.[1]

On the one hand, such restrictions may ensure that revenues go to specific types of transportation investment and thereby reassure taxpayers. On the other hand, constraints that are too restrictive can prevent making the most cost-effective investments. For example, if a state has a goal to build a multimodal transportation system that provides access for people with different abilities, but all transportation revenues are set aside for highway purposes, then the state will have a hard time reaching goals.

To invest in the most cost-effective, highest-impact projects, the federal government and states should allow funding to be used across modes.

Example: California constitutional flexibility

California offers an example of flexibility in the use of transportation revenues, including gas tax revenues. California's Constitution limits the legal uses of gas tax proceeds in Article XIX. This constitutional language imposes few restrictions on the type of transportation infrastructure the state may pursue with gas tax proceeds. CalSTA has broad discretion to choose how to spend gas tax funds. Roadways, non-motorized facilities, and transit guideways are all legal uses of gas tax proceeds.[2]

1 American Association of State Highway and Transportation Officials, *Transportation Governance and Finance: A 50-State Review of State Legislatures and Departments of Transportation* (2016), 66, www.financingtransportation.org/pdf/50_state_review_nov16.pdf.
2 Cal. Const. art. XIX, http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=CONS&article=XIX.

Example: Virginia statutory flexibility

Notably, **Virginia's** state statutes include an affirmative use of state funds for bicycle and pedestrian projects: "Nothing contained in this chapter and no regulation promulgated by the Commissioner of Highways or the Board shall be construed to prohibit or limit the ability of the Board or the Department to fund and undertake pedestrian or bicycle projects except in conjunction with highway projects."[1]

- *Allocate funding to outcomes rather than jurisdictions or modes*

A higher level of government might not wish to provide total flexibility to lower levels of government for how funding is used.

A promising approach would be to allocate funding to achieving specific outcomes, regardless of jurisdiction or mode. For example, if a state has a goal to reduce greenhouse gas emissions from the transportation sector, it might set aside funding for projects that do so. Different MPOs and local governments could compete for such funding, with the projects that are demonstrated to most cost-effectively lower emissions being selected.

1 Va. Code. § 33.2-111 ("Funding and undertaking of pedestrian or bicycle projects apart from highway projects not prohibited"), http://law.lis.virginia.gov/vacode/title58.1/chapter22.1/section33.2-111/.

References

The following reference details the extent to which different states provide flexible use of transportation funding:

- American Association of State Highway and Transportation Officials. *Transportation Governance & Finance: A 50-State Review of State Legislatures and Departments of Transportation*. 2nd ed. 2016. This report is a comprehensive, up-to-date reference tool for State governments, as well as for other interested stakeholders, about how all 50 States and the District of Columbia govern and pay for their transportation systems. www.financingtransportation.org/pdf/50_state_review_nov16.pdf.

Delegate investment decisions to policymakers with sufficiently broad authority

"If you are building a culture where honest expectations are communicated and peer accountability is the norm, then the group will address poor performance and attitudes."
—Dr. Henry Cloud

In order to make the most cost-effective investments, it is critical to have the flexibility to direct funding how it can best achieve desired outcomes—regardless of jurisdiction or mode.

But it is also critical for the policymakers who select investments to have sufficiently broad authority to select the most cost-effective ones.

In theory, states and MPOs are to make investment decisions in a process that is "continuing, cooperative, and comprehensive to the degree appropriate."[1] In practice, individual jurisdictions lack sufficient authority on their own to make cost-effective investments and multiple jurisdictions do not always cooperate successfully to jointly advance shared goals.

As an example of the trouble with policymakers having too little authority, **Virginia** offered this self-assessment: "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."[2]

One approach is to delegate decisions to policymakers with sufficiently broad authority in order to be able to select the most cost-effective investments. An alternative approach is to look for a group of decision-makers, for example, assembled as a MPO, to coordinate selecting the most cost-effective investments.

Regardless, the federal government and states should hold states, MPOs and local governments accountable for achieving desired outcomes.

- *Delegate investment decisions to collaborating policymakers*

Ideally, an outcomes-based approach selects the most cost-effective investments to achieve a range of desired outcomes.

In practice, responsibility for both investments and outcomes is dividing amongst multiple government bodies. For example, a state DOT has authority over highways, a transit agency provides bus service, a city controls zoning that influences future travel demand, a regional economic development organization is looking to see more jobs, and the county public health department wants to see people living more active

1 23 U.S.C. § 135(a)(3), § 134(c)(3).
2 Virginia Office of Intermodal Planning and Investment, *VTrans 2035: Regional and Local Decision Making* (2009), 1, www.vtrans.org/resources/vtrans2035_regional_and_local_cs_final.pdf.

lives. Typically, no one government agency has authority over all potential investments and all desired outcomes. Often, some relevant agencies make joint decisions, for example, as an MPO, but others such as public health officials and school districts don't have seats at the table.

Ideally, decision-making bodies can be identified that are in a position to link a range of investments to a range of outcomes. Absent a single body, different bodies can develop coordination agreements to jointly ensure that investments effectively achieve outcomes.

Moreover, although changing decision-making structures might not be feasible, at least not in the short term, the federal government and states can provide states, MPOs and local governments with more flexibility and push them to be more comprehensive and cooperating in their decision-making.

Example: Oregon's Metro decides transportation and land use

As far back as the 1950s, **Portland, Oregon**, area leaders saw an unfilled need to provide regionwide planning and coordination to manage transportation and land use issues that cross jurisdictional boundaries. They also saw a need to protect farms and forests from urbanization and to provide services that are regional in nature. Metro has evolved to serve that, becoming the nation's first directly elected regional government. As the MPO for the region, Metro works collaboratively with cities, counties and transportation agencies to decide how to invest federal highway and public transit funds within its service area. It creates a long-range transportation plan, leads efforts to expand the public transit system and helps make strategic use of a small subset of transportation funding that Congress sends directly to MPOs. Metro also manages the boundary that separates urban land from rural land in the Portland region and works with communities to plan for future population growth and meet needs for housing, employment, transportation and recreation.[1] Learn more: www.oregonmetro.gov/regional-leadership/what-metro

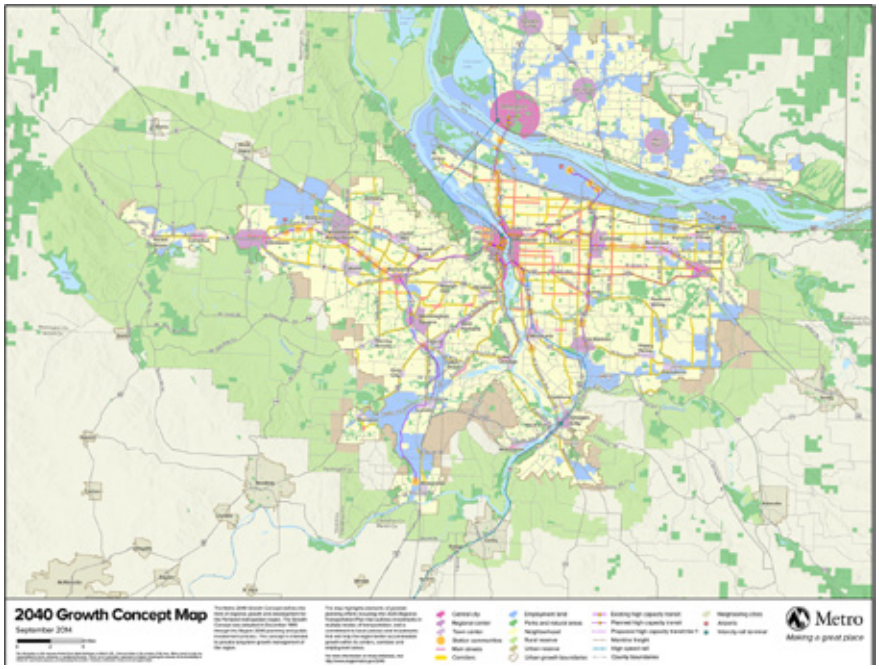


Figure 18: Portland Metro's 2040 Growth Concept

1 Metro, "2040 Growth Concept," www.oregonmetro.gov/2040-growth-concept.

- *Hold decision-makers accountable for achieving outcomes*

Given flexibility in how funding is spent, decision-makers might pursue narrower objectives or might not select the most cost-effective investments.

In tandem with flexibility, the federal government and states should hold states, MPOs and local governments accountable for making cost-effective investments to achieve identified outcomes.

For example, when the federal government allocates to states, it could hold them better accountable for achieving particular outcomes. As noted above, MAP-21 is a step in this direction. Or when the state DOT allocates to MPOs, cities, counties transit agencies or ports, it can require accountability for achieving outcomes in exchange for funding.

Example: Minnesota holds ATPs accountable

Minnesota offers an example of thinking about who makes decisions in response to MAP-21. Minnesota relies on eight regional partnerships, called Area Transportation Partnerships or ATPs, whose boundaries are based on MnDOT's State Aid Districts. The ATPs integrate the state and local priorities within their region and recommend a minimum 4-year program for federally funded transportation investments, called a draft Area Transportation Improvement Program (ATIP). Each draft ATIP includes a prioritized list of projects that aid in solving transportation problems and implementing the long-range objectives for the area.

MnDOT reformed its project selection process in 2013 in response to MAP-21. Under the previous process, money was allocated to ATPs by formula and ATPs got to decide how to spend money as they wanted while meeting centrally determined performance targets. Under the reformed process (which applies to all projects that will start construction in 2017 and after), money is allocated based on estimates of need, districts must conform to statewide spending targets and districts must prove that their chosen projects are as effective at meeting performance targets as project lists created by MnDOT.[1] Learn more: www.auditor.leg.state.mn.us/ped/2016/mndotprojects.htm.

Example: California holds MPOs accountable

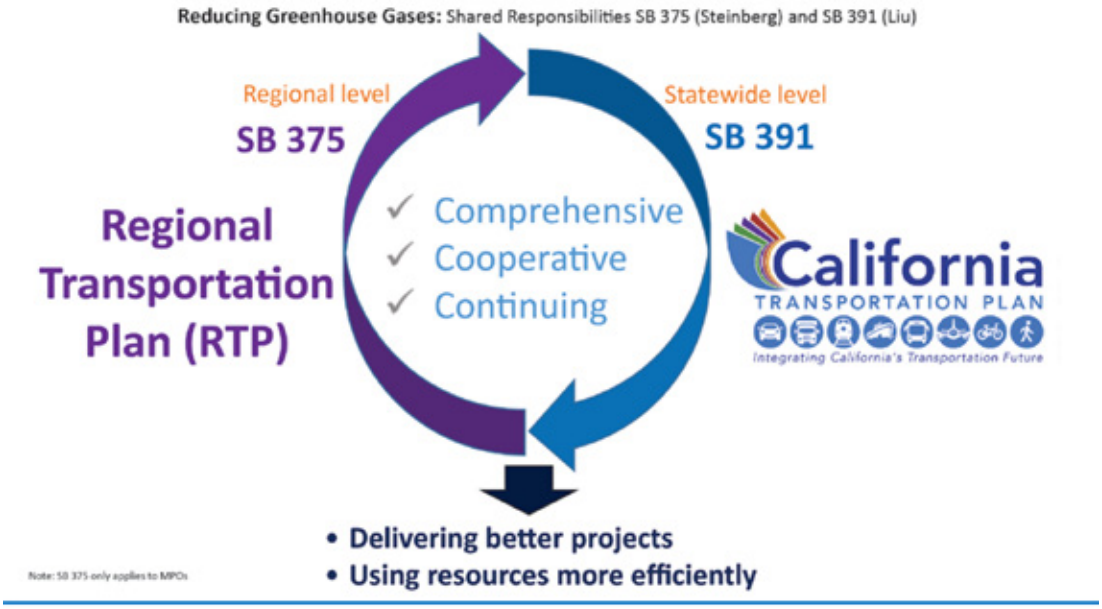
In **California**, 75% of all state transportation revenue to be programmed into the STIP is allocated to MPOs, and 25% is retained by the state. This 75% exists on top of a statutory formula distribution of highway user fees to cities and counties. Thus, the role of the 75%/25% percent split serves to ensure most project programming happens at the MPO level, not the state level. California is prescriptive about how MPOs incorporate performance-based decision-making into Regional Transportation Plans.

"Regional Transportation Plans are developed to reflect regional and local priorities and goals and they are also instruments that can be used by federal and state agencies to demonstrate how regional agency efforts contribute to those federal and state agencies meeting their own transportation system goals. A clear articulation of regional goals helps regions select projects in furtherance of their own goals, but also helps the federal and state government understand how the regional plans will contribute to statewide or nationwide

1 Minnesota Office of the Legislative Auditor, *Evaluation Report: MnDOT Highway Project Selection* (2016), 37, www.auditor.leg.state.mn.us/ped/pedrep/mndotprojects.pdf.

goals. The RTP vision, goals and related performance measures are developed through a bottom-up process that involves input from stakeholders in the region, including the MPO member jurisdictions and the public. The RTP, including goals and performance measures, are formally adopted at the discretion of the MPO governing board."[1]

California offers an example of turning over a large share of funding to MPOs, but with strings attached. Further, the California Transportation Commission has final approval authority over the RTPs and can choose to veto an entire MPO if the CTC finds that a MPO ignored guidance. Learn more: www.catc.ca.gov/programs/rtp.htm.



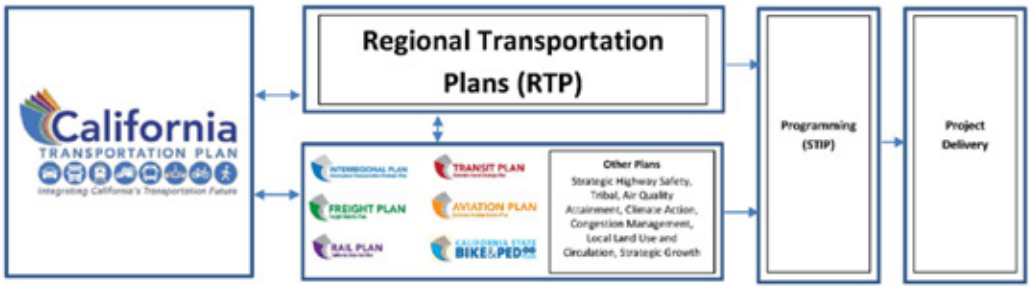


Figure 19: California and regions share responsibility for making cost-effective investments

1 California Transportation Commission, *2017 Regional Transportation Plan Guidelines for Metropolitan Planning Organizations*, 170, www.dot.ca.gov/hq/tpp/offices/orip/rtp/docs/2017RTPGuidelinesforMPOs.pdf.

References

The following references offer additional guidance on delegating transportation investment decisions:

- Eric Jaffe. "The End of Federal Transportation Funding as We Know It." *CityLab*, Mar. 11, 2013. This story summarizes the debate about how—and even whether—Washington can pay for local roads and rails. www.citylab.com/cityfixer/2013/03/its-end-federal-transportation-funding-we-know-it/4931.

- Robert Puentes. *A Bridge to Somewhere: Rethinking American Transportation for the 21st Century*. Washington, D.C.: Brooking Institution, 2008. This paper recommends reforms in three major policy areas: federal leadership, empowerment of metropolitan areas, and optimization of the program. www.brookings.edu/research/a-bridge-to-somewhere-rethinking-american-transportation-for-the-21st-century.

- Bruce Katz & Robert Puentes, eds. *Taking the High Road: A Metropolitan Agenda for Transportation Reform*. Washington, D.C.: Brookings Institution, 2006. This book lays out an agenda for reform that responds directly to those responsible for putting these policies into practice—leaders at the state, metropolitan, and local levels—and presents public officials with options for reform. www.brookings.edu/book/taking-the-high-road.

- Robert Puentes & Linda Bailey. *Improving Metropolitan Decision Making in Transportation: Greater Funding and Devolution for Greater Accountability*. Washington, D.C.: Brookings Institution, 2003. This paper examines how transportation decision making has evolved, especially in metropolitan areas. It also argues for expansion of current transportation laws to increase the amount of funding sources and the decision making powers in metropolitan areas. www.brookings.edu/research/improving-metropolitan-decision-making-in-transportation-greater-funding-and-devolution-for-greater-accountability.

Phase 3: Programming

What investments do we make?

Programming is critical to ensuring transportation investments deliver desired results to the public.

FHWA provides excellent guidance on the programming phase: linking planning to programming, developing an investment plan, and selecting projects and strategies. This part builds on their guidance.

The programming phase includes selecting specific investments in projects and programs. Capital projects are listed in statewide transportation improvement programs (STIPs), (metropolitan) transportation improvement programs (TIPs), or in other investment plans or budgets. The programming phase may also include development of a mid-term (10-year) investment plan, which sits part way between a long-range (20-year) transportation system plan and a short-term (5-year) capital or other investment plan.

In theory, programming would be an administrative decision. It addresses merely the sequence in which to make investments outlined in the long-range plan, with an expectation that everything that is planned will eventually get done.

In practice, because the flow of transportation funding can be irregular and is often insufficient, some planned investments are never made while unplanned opportunities can be retrofitted into existing plans to allow them to proceed. In effect, programming can sometimes function as short-term planning. FHWA underscores the importance of strongly linking planning to programming—noting that many DOTs and MPOs have had trouble doing so.

Programming is also an opportunity to review planned investments with greater clarity and precision, sometimes resulting in a change in plans. During the planning phase, sometimes only rough estimates of benefits and costs are possible. Moreover, with the passage of time, projects that once might have been costs-effective may no longer be so, and vice versa.

Building on FHWA guidance, the programming phase includes this recommended step detailed below:

➔ **Make cost-effective investments to achieve desired outcomes**

Make cost-effective investments to achieve desired outcomes

"Investing … is the process of committing resources in a strategic way to accomplish a specific objective."
- Alan Gotthardt

Programming is "where the rubber meets the road." What is funded is what gets done.

Especially in an era of limited public resources, agencies have a long list of potential investments and resources to fund only some of these. Thus agencies must make decisions about which investments to make. The programming process varies considerably across states and MPOs. Some agencies are transparent by identifying selection criteria, scoring potential investments, and publishing ranking lists to clearly show why some investments were made and not others. But some agencies use a less performance-driven process, relying on expert judgment to decide where to invest—an approach that has merits but that also risks a lack of transparency about how decisions are made.

- *Invest in what's planned*

Ideally, the most effective investments are already planned, making programming a lesser exercise in timing. But when a project has been planned for decades, it makes sense to reassess its value in light of current desired outcomes.

Link performance-based planning more tightly with performance-based programming so that only the most cost-effective projects and programs are advanced.

Example: North Carolina policy to projects

Reforms put in place in January 2009 ensure that the **North Carolina** DOT's plans and projects are developed and awarded in a professional manner. Based on input from stakeholders across the state, NCDOT officials have developed a strategic plan for transportation decision-making that focuses on achieving the department's long-term goals of safety, mobility and infrastructure health. This process begins with long-range goals and investment decisions and ends with a detailed work program that spells out specific projects needed to achieve these goals. This format results in a reliable and realistic work plan that is both transparent and accountable. As detailed in Figure 20, the policy to projects process begins with the 30-year Statewide Long-Range Plan, also called the 2040 Plan and the 10-year Program and Resource Plan, ending with the 5-year Work Program. Learn more: www.ncdot.gov/performance/reform.

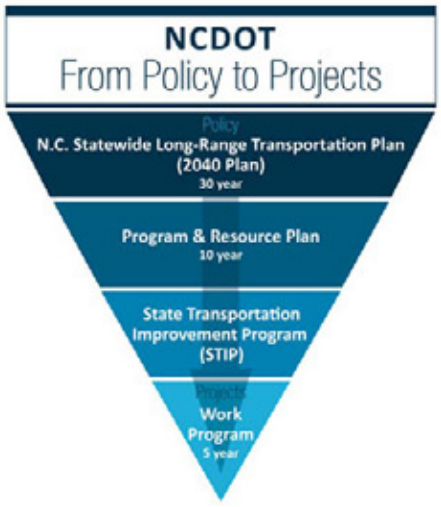


Figure 20: NCDOT's policy to projects process begins with the 30-year long-range plan and ends with a 5-year work program.

- *Select the most cost-effective investments, regardless of jurisdiction or mode*

Bottom line, regardless of what is planned and to the extent that funding mechanisms allow, select the most cost-effective investments, regardless of jurisdiction or mode. It is important to note that evaluating cost-effectiveness relies on value judgments and distributional impacts. The goals established by states and MPOs should serve as the basis for evaluating the benefits of the project.

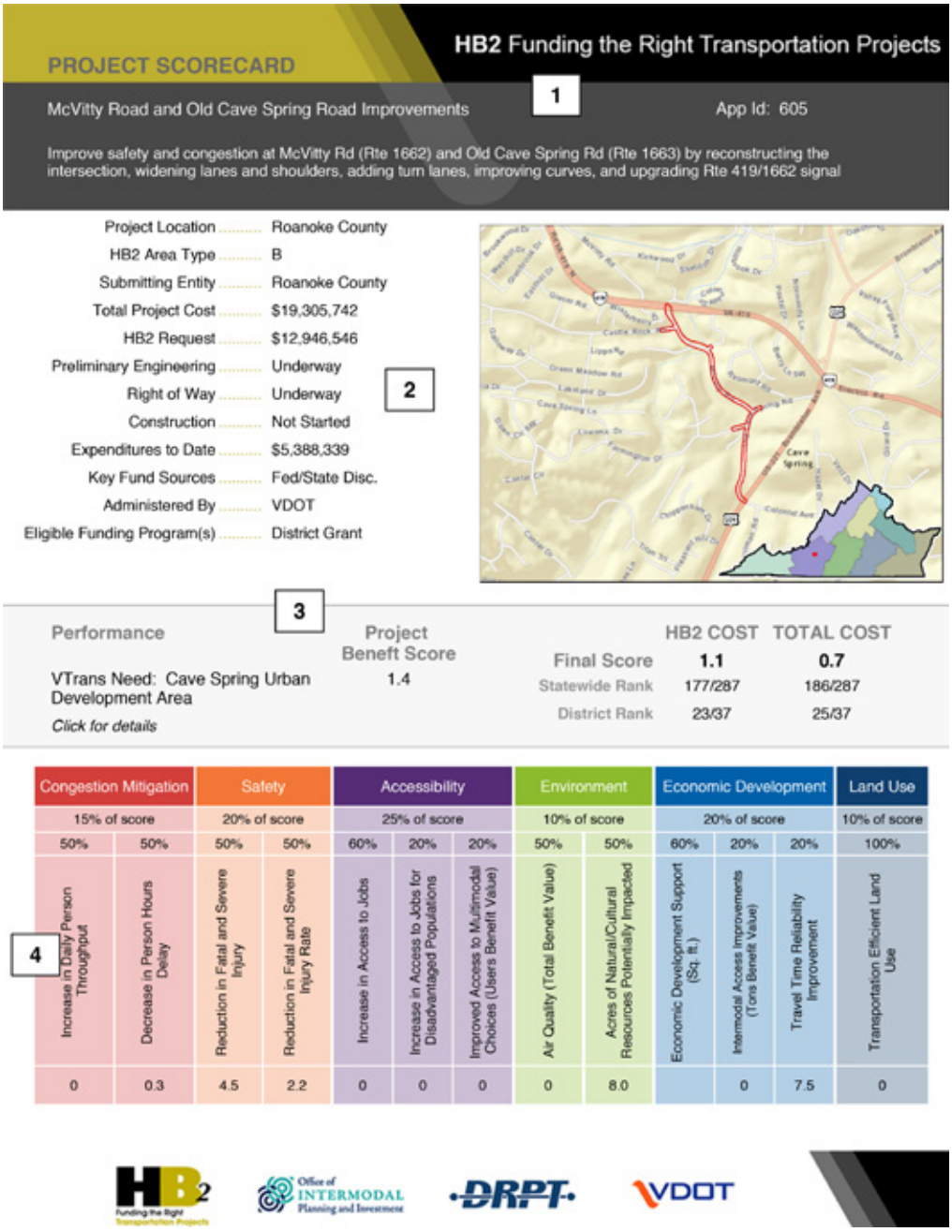
Example: Virginia's SMART SCALE

For example, **Virginia's** implementation of House Bill 2, called SMART SCALE, is about picking the right transportation projects for funding and ensuring the best use of limited tax dollars. It is the method of scoring planned projects included in the long-range transportation plan, VTrans, for funding by House Bill 1887. Transportation projects are scored based on an objective, outcomes-based process that is transparent to the public and allows decision-makers to be held accountable to taxpayers. Projects seeking funding are scored across 6 factor areas and 13 performance measures.[1] Learn more: http://smartscale.org.

Factor Area	Measure	
Safety	S.1	Number of Fatal and Injury Crashes (50%)
	S.2	Rate of Fatal and Injury Crashes (50%)
Congestion Mitigation	C.1	Person Throughput (50%)
	C.2	Person Hours of Delay (50%)
Accessibility	A.1	Access to Jobs (60%)
	A.2	Access to Jobs for Disadvantaged Persons (20%)
	A.3	Access to Multimodal Choices (20%)
Environmental Quality	E.1	Air Quality and Environmental Effect (50%)
	E.2	Impact to Natural and Cultural Resources (50%)
Economic Development	ED.1	Project Support for Economic Development (60%)
	ED.2	Intermodal Access and Efficiency (20%)
	ED.3	Travel Time Reliability (20%)
Land Use*	L.1	Transportation-Efficient Land Use (100%)
* for areas over 200,000 in population		

Table 3: Virginia's SMART SCALE evaluates potential projects using weighted performance measures in various factor areas. Virginia SMART SCALE, "What is SMART SCALE?" http://vasmartscale.org/about/default.asp.

1 Virginia SMART SCALE, "How to Read a Scorecard," http://vasmartscale.org/documents/howtoreadascorecard.pdf.



PROJECT SCORECARD

HB2 Funding the Right Transportation Projects

McVitty Road and Old Cave Spring Road Improvements

1

App Id: 605

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

Project Location	Roanoke County
HB2 Area Type	B
Submitting Entity	Roanoke County
Total Project Cost	$19,305,742
HB2 Request	$12,946,546
Preliminary Engineering	Underway
Right of Way	Underway
Construction	Not Started
Expenditures to Date	$5,388,339
Key Fund Sources	Fed/State Disc.
Administered By	VDOT
Eligible Funding Program(s)	District Grant

2

3

Performance

VTrans Need: Cave Spring Urban Development Area

Click for details

Project Benefit Score: 1.4

	HB2 COST	TOTAL COST
Final Score	1.1	0.7
Statewide Rank	177/287	186/287
District Rank	23/37	25/37

4

Congestion Mitigation		Safety		Accessibility			Environment		Economic Development			Land Use
15% of score		20% of score		25% of score			10% of score		20% of score			10% of score
50%	50%	50%	50%	60%	20%	20%	50%	50%	60%	20%	20%	100%
Increase in Daily Person Throughput	Decrease in Person Hours Delay	Reduction in Fatal and Severe Injury	Reduction in Fatal and Severe Injury Rate	Increase in Access to Jobs	Increase in Access to Jobs for Disadvantaged Populations	Improved Access to Multimodal Choices (Users Benefit Value)	Air Quality (Total Benefit Value)	Acres of Natural/Cultural Resources Potentially Impacted	Economic Development Support (Sq. ft.)	Intermodal Access Improvements (Tons Benefit Value)	Travel Time Reliability Improvement	Transportation Efficient Land Use
0	0.3	4.5	2.2	0	0	0	0	8.0		0	7.5	0

Figure 21: Virginia's SMART SCALE gives each potential project a scorecard

- *Weigh benefits against costs*

Sometimes a jurisdiction identifies a large "need," for example, a section of highway that is frequently congested or a stretch of road prone to fatal accidents. Seeing a problem, engineers work to design a fix for the problem. Often the cost of a project can run into the hundreds of millions or even billions of dollars. Once a lot of political and technical effort have gone into developing a project, there is a lot of momentum to fund and construct it.

But in an era of limited resources, a decision to fund one big project for $1 billion can translate to a decision to not fund another 50 smaller projects at $20 million each. A bigger or smaller project isn't necessarily better. The point is that a bigger project that costs 50 times as much should deliver at least 50 times as much value as a smaller project: save 50 times more lives, move 50 times as many people, etc.

Example: San Francisco Bay Area project performance assessment

As part of the planning process, the Metropolitan Transportation Commission (MTC) for the **San Francisco Bay Area** uses a project performance assessment to evaluate over 1,000 projects along targets and a benefit/cost ratio. The project performance assessment is used to place projects in the plan and allocate discretionary funds.[1]

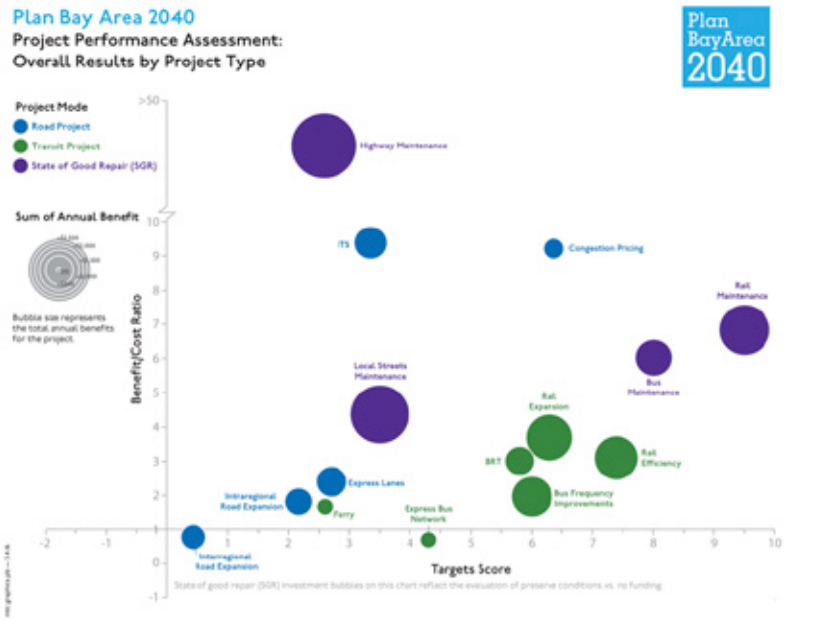


Figure 22: Plan Bay Area 2040 assessed the benefit-cost ratio for projects of various types and sizes.

The assessment relies on qualitative metrics embodied in goals and quantitative measures of cost effectiveness. High performing projects were prioritized for funding in Plan Bay Area 2040.[2] Low performing projects underwent additional scrutiny and required project sponsors to present a compelling case for inclusion in the plan.[3] In **California**, the process of selecting projects for inclusion in regional transportation plans is very important, as it constrains the projects that will ultimately end up in regional transportation improvement programs. Learn more: http://2040.planbayarea.org/reports.

1 Transportation for America, *The Innovative MPO*, (2014), http://t4america.org/maps-tools/the-innovative-mpo.
2 Metropolitan Transportation Committee, "Plan Bay Area 2040 Project Performance Assessment: Overall Results by Project Type," www.planbayarea.org/sites/default/files/pdf/files/files10305.pdf.
3 Smart Growth America, *The Innovative DOT*, 3rd ed. (2015), http://smartgrowthamerica.org/resources/the-innovative-dot-2015.

Example: Tennessee's DL3 software

In 2012, **Tennessee** shifted to a technology-driven prioritization process using Decision Lens (DL3) software. Under this process, based on input from TDOT staff, criteria are identified related to the guiding principles in the long-range transportation plan. Each principle is weighted differently. The software ranks projects based on Benefit Score, Investment Funding Source and Scheduling Constraints while additional consideration is given to Even Distribution of Projects per Region, Phase of construction, and MPO/RPO distribution. But note that assigning weights isn't merely a technical exercise but affects which investments and hence which outcomes are prioritized. It is better to use a ranking tool as part of an effort to understand what matters most to the public. Learn more: http://decisionlens.com/news-events/news/decision-lens-selected-by-tennessee-department-of-transportation-for-project-prioritization-planning.

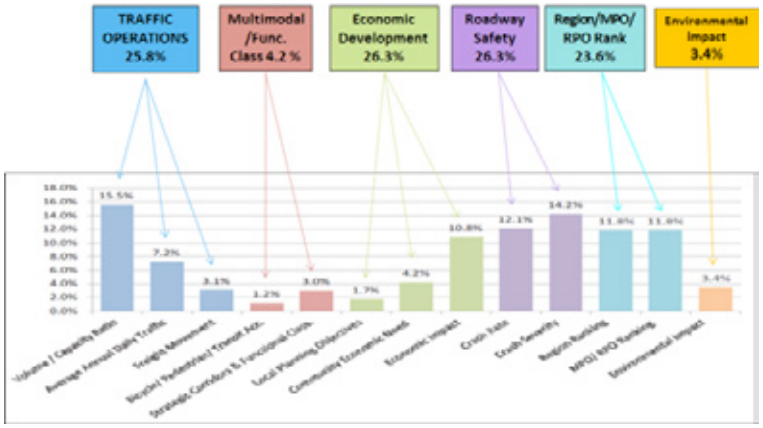


Figure 23: Tennessee's DL3 software weights criteria to rank projects

References

This report builds on especially federal guidance on performance-based transportation decision-making:

- Federal Highway Administration. *Performance-Based Planning and Programming Guidebook*. 2013. See especially § 8 (Programming–Develop Investment Priorities in the TIP/STIP). www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook.

The following reference offers more guidance on outcomes-based programming:

- Chicago Metropolitan Agency for Planning. *Performance-Based Funding for Transportation: A Compendium*. 2013. The report reviews best practices in performance-based planning and programming among peer agencies across the United States. www.cmap.illinois.gov/mobility/strategic-investment/performance-based-funding/resources.

Phase 4: Reporting

How did our investments perform? What do we tell the public?

Reporting to the public is perhaps the most important phase in an outcomes-based approach.
The reporting phase includes monitoring outcomes—on the ground and over time. It also includes analyzing results, comparing these to plans, and adjusting expectations. Finally and most importantly, it includes making clear to the public the outcomes their investments actually achieved.

At the end of the day, the public wants an assessment of what investments were made at what cost and what outcomes were achieved. For a government to be accountable and transparent, hence to continue to enjoy the trust and support of taxpayers, the reporting phase is absolutely essential.

FHWA provides good guidance on the reporting phase: monitoring system performance, evaluating program effectiveness, and reporting performance results. This part builds on their guidance. Yet, current practice in this area is still limited..

Moreover, our outcomes-based framework focuses on results of importance to the public. The aim is for governments to be more accountable and transparent.

Building on FHWA guidance, the reporting phase includes these recommended steps detailed below:

- ➔ **Analyze outcomes and adjust expectations**
- ➔ **Report returns on investments to taxpayers**

Analyze outcomes and adjust expectations

"Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted."
—Albert Einstein

"Evaluate what you want, because what gets measured gets produced."
—James Belasco

To determine if the public is getting the outcomes they expect, it is critical to monitor outcomes on the ground and over time, to analyze results, to compare results to anticipated benefits/outcomes, and to adjust expectations when anticipated outcomes and reality differ.

FHWA provides good guidance on monitoring system performance and evaluating program effectiveness. This section builds on their guidance.

Typically, significant energy is expended to look ahead to the expected impacts of a potential investment. The National Environmental Policy Act (NEPA) requires an evaluation of the economic, social, and environmental impacts, positive or negative, of any project seeking federal funding before construction can commence.[1] But there are few requirements for agencies to look back one, five or ten years after completion of a project to assess what outcomes were actually achieved. Current practice in this area is limited.

- *Monitor outcomes over time*

Before investing your own money in a mutual fund, you first read the prospectus to get a sense of what sort of performance you can expect. But after you actually invest, you make sure to monitor performance, quarter by quarter and year by year, looking to see if they are performing acceptably.

Similarly, before making transportation investments, agencies use models to estimate expected outcomes. But after money has been spent, it is critical to monitor outcomes to determine to what extent investment are achieving the results taxpayers expect.

To the extent possible, both models to estimate outcomes before investing and the measurement of actual outcomes after investing are key.

It is also key to monitor outcomes over time in order to assess trends.

- *Analyze cause and effect*

The energy field has longer experiences with an outcomes-based than the transportation field. According to the U.S. Department of Energy, "The cause and effect relationship between program outputs and their eventual outcomes is complex. It is not easy to demonstrate that a particular outcome was directly

1 Federal Highway Administration, "Environment," last modified Jan. 31, 2017, www.fhwa.dot.gov/environment.

caused by program activities. … Outcomes can, and often do, reveal the impact of the program, but without collaborating data, it is difficult to demonstrate that your program was the cause of the outcome(s). The outcomes of public sector services are inevitably affected by many events outside public control. … To determine the extent to which a program has affected the outcomes and to measure the impact, you need to do an in-depth analysis."[1]

It isn't sufficient to merely measure performance and compared to targets. It is also necessary to understand what actions are affecting outcomes of interest.

Example: Washington State Transportation Performance Audit Board

In 2004, the Transportation Performance Audit Board (TPAB) conducted a review of **Washington** State DOT's use of performance management. They noted: "The pervasive influences of those causes that are beyond government's control are not just a measurement issue, dealt with in the collection and calculation of data. It requires that performance measures be designed from a thorough understanding of cause and effect, as well as of the uncertainties that are introduced into effects by uncontrollable causes. … For WSDOT, improving program effectiveness strengthens the relationships between its outputs, the outcomes from these outputs, and the broader policy goals set for the agency. It does this by targeting thinking on this relationship and by defining the magnitude of the relationships through the application of the correct statistical and research methods. … This type of systematic measurement and reporting increases understanding about the measurable extent to which a program can achieve desired outcomes. Over time, it produces trend data that can be used to establish measurement standards for such relationships to determine whether programs are being managed as effectively as possible." Learn more: www.wstc.wa.gov/policyplanning/tpab.

- *Revise targets and models*

According to FHWA, "By monitoring the success of the funded projects to address performance goals, a feedback loop is created for each planning cycle. Demonstrating that improvements address key performance measures, it can then be tied to projects funded over the previous four years, creating a framework for demonstrating the effectiveness of investments. Establishing and maintaining monitoring efforts between plans, projects, and tracking performance throughout the feedback cycle also results in better financial accountability and transparency."[2]

With an outcomes-based approach, it is essential that the reporting phase circle back to the planning, governance & finance, and programming phases.

1 U.S. Department of Energy, *Guidelines for Performance Measurement* (1996), 16, 27, www.directives.doe.gov/directives-documents/100-series/0120.1-EGuide-5.

2 Federal Highway Administration, *Performance-Based Planning and Programming Guidebook* (2013), § 9, www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook/page09.cfm.

Example: Maryland Transportation Authority

The **Maryland** Transportation Authority (MDTA) is an independent agency responsible for managing, operating and improving the State's toll facilities. MDTA first formally adopted performance-based management after the passage of Maryland's Managing for Results (MFR) statute in 1996. If MDTA performance consistently exceeds targets that are set internally, a new target or methodology is adopted. If MDTA performance is below target, a quality improvement team is assigned to work with MDTA and improve the process and increase performance. MDTA tries to avoid re-adjusting targets downwards. Targets not met also are used in lessons learned.[1] The Authority evaluates what happened and why it did not reach the target.

Questions asked include:

- Were there areas within the target that didn't work?
- Is the MDTA attempting to set too high a target?
- Is the MDTA measuring the wrong component?[2]

MDOT publishes an annual Attainment Report on overall system performance. Learn more: www.mdot.maryland.gov/newMDOT/Planning/Index.html.

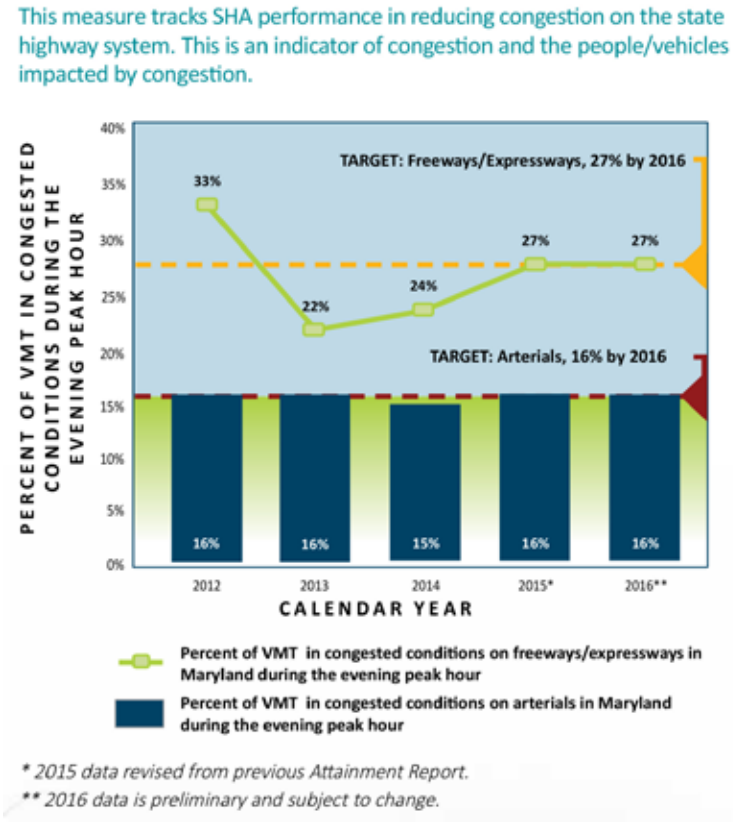


Figure 24: Maryland Transportation Authority tracks and assesses performance targets over time.

1 Maryland DOT, *2017 Annual Attainment Report on Transportation System Performance*, www.mdot.maryland.gov/newMDOT/Planning/CTP/CTP_17_22/Documents/2017_AR_01_12_17.pdf.

2 Cambridge Systematics, *Case Studies*, vol. 3 of *NCHRP Project 8-70: Target-Setting Methods and Data Management to Support Performance-Based Resource Allocation by Transportation Agencies* (Transportation Research Board, 2009), www.trb.org/Publications/Blurbs/164179.aspx.

References

This report builds on especially federal guidance on performance-based transportation decision-making:

- Federal Highway Administration. *Performance-Based Planning and Programming Guidebook*. 2013. See especially § 9 (Ongoing Monitoring, Evaluating, and Performance Reporting). www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook.

The following references offer more guidance on monitoring and evaluating outcomes.

- Federal Highway Administration. "Analysis and Performance Measurement." Last modified Feb. 5, 2017. Analysis and performance measurement are integral to planning for operations. Key topics of analysis and performance measurement are: analysis and simulation tools, benefit-cost analysis, performance measures and system monitoring, and operations data for planning. http://ops.fhwa.dot.gov/plan4ops/focus_areas/analysis_p_measure/analysis_p_measure.htm.

- Victoria Transport Policy Institute. "Performance Evaluation: Practical Indicators For Evaluating Progress Toward Planning Objectives." Last modified Jan. 2, 2017. This web page describes performance evaluation, which applies specific performance indicators to measure progress toward specific goals and objectives. www.vtpi.org/tdm/tdm131.htm.

- Florida Department of Transportation. "Transit Information and Performance Management." 2017. Technical guidance for collecting transit information and measuring performance. www.fdot.gov/transit/Pages/NewTransitInformationandperformanceManagement.shtm.

- Transportation Economics Committee. "Performance Evaluation." Transportation Resource Board, 2017. Performance Evaluation refers to a monitoring and analysis process to determine how well policies, programs and projects perform with regard to their intended goals and objectives. This web page provide numerous resources. http://bca.transportationeconomics.org/setup/performance-evaluation.

- Caroline Rodier & Margot Spiller. *Model-Based Transportation Performance: A Comparative Framework and Literature Synthesis*. San José, CA: Mineta Transportation Institute, 2012. This report compares performance measures recommended to achieve desired goals and reviews the literature to determine the degree to which these measures have been implemented and what they indicate about the relative effectiveness of land use, transit, and automobile pricing policies. http://transweb.sjsu.edu/project/2805.html.

Report returns on investments to taxpayers

"My experience is that accountability is an extremely powerful tool to align an organization toward its objectives."
— Susan Gomez

Ultimately, governments need to close the loop with the public, reporting on what outcomes their taxes achieved.

FHWA provides good guidance reporting results to policymakers and the public. This section builds on their guidance.

Yet, examples of transportation agencies fully reporting returns on investment in a way that compares benefits achieved to costs incurred in a system-wide manner are hard to find.

- *Report overall returns on investment*

It is easier to provide examples of success stories. Doing so helps to communicate what investments are buying. It is harder to have a system-wide accounting system that in some manner tallies up all benefits and costs, and reports some kind of totals for these.

One challenge is that public sector investments seek to advance multiple goals, not all of which are easy to quantify. Nonetheless, it is important to try, and to provide taxpayers with some high-level but quantified sense of what their taxes are buying, if necessary, noting limitations and uncertainties. Doing so is the way to ensure continuing taxpayer trust and support.

Example: Washington's biennial transportation report

In 2010, the **Washington** legislature reaffirmed six statewide transportation policy goals to guide the planning for operation, and performance of, and investment in the state's transportation system: 1) preservation, 2) safety, 3) mobility (congestion relief), 4) environment, 5) stewardship, and 6) economic vitality.[1] The Office of Financial Management (OFM) is responsible for establishing objectives and performance measures for the six goals, and for preparing a biennial progress report for the Legislature and Governor. The purpose of these reports is to assess progress toward the goals and contribute to the overall performance of the transportation system. Rather than report on agency-specific performance, the focus is on overall system performance. The 2016 Biennial Transportation Attainment Report is the fourth assessment of the performance of the state's transportation system against the six policy goals. The 2016 edition includes reporting on six policy goals, as well as a performance dashboard that highlights the key performance indicators found within the report.[2] Learn more: www.wsdot.wa.gov/Accountability/PerformanceReporting/Attainment.htm.

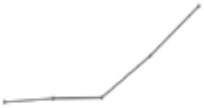
1 Washington Substitute Senate Bill 6577 (2010), http://app.leg.wa.gov/billsummary?Year=2009&BillNumber=6577.
2 Washington State DOT, *2016 Biennial Transportation Attainment Report*, 10, http://wsdot.wa.gov/publications/fulltext/graynotebook/AR2016.pdf.

Statewide Transportation Goals, Objectives and Performance Measures

Summary of progress and five year trend through 2015

Goal 1- SAFETY

To provide for and improve the safety and security of transportation customers and the transportation system.

Measure	Objective	Status	Progress	Desired trend	Five-year trend
Measure 1.1 Traffic fatalities Number and rate of traffic fatalities per 100 million Vehicle Miles Traveled (VMT)	Reduce roadway fatalities	Traffic fatalities numbered 567 (preliminary) in 2015, a 24.9% increase from 454 fatalities in 2011.	–	↓	
	Reduce the rate of traffic fatalities per 100 million VMT	The rate of traffic fatalities per 100 million VMT was 0.95 (preliminary) in 2015, an 18.8% increase from the 0.80 rate in 2011.	–	↓	
Measure 1.2 Collision reduction Number of collisions and percentage resulting in serious or fatal injuries	Reduce number of collisions	Traffic collisions numbered 117,137 (preliminary) in 2015, an 18.4% increase since 2011.	–	↓	
	Reduce severity of collisions	Serious injuries resulting from traffic collisions numbered 2,094 (preliminary) in 2015, a 1.3% decrease since 2011.	✓	↓	
Measure 1.3 Pedestrian & bicyclist fatalities Reduce pedestrian and bicyclist fatalities	Reduce the rate of pedestrian fatalities per 100,000 population	The rate of pedestrian fatalities was 1.22 in 2015 (preliminary), an 8.9% increase from 1.12 in 2014 and a net increase of 22% from the 1.00 rate in 2011.	–	↓	
	Reduce the rate of bicyclist fatalities per 100,000 population	The rate of bicyclist fatalities was 0.20 in 2015 (preliminary), a 100% increase from 0.10 in 2014 and a net increase of 25% from the 0.16 rate in 2011.	–	↓	
Measure 1.4 Ferry passenger injuries Number of passenger injuries per one million passengers	Reduce passenger injuries	The ferries passenger injury rate was 0.42 in fiscal year (FY) 2016, a decrease from a rate of 0.93 in FY2015.	✓	↓	
Measure 1.5 Facial recognition license suspensions & record cancellations Number of identity theft complaints	Reduce fraudulent driver's licenses and records	Identity theft complaints numbered 9,043 in 2015, an increase of 86.3% since 2011.	–	↓	

Data source: WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: ✓ = Performance is moving in a favorable direction based on the five-year trend. – = Performance is not moving in a favorable direction based on the five-year trend.

Figure 25: Washington reports on goals, objectives, performance measures and five-year trends.

- *Report who makes decisions how*

It isn't sufficient to report merely the returns on investment to taxpayers. The public wants and needs to understand—in a general sense—who makes decisions how. They need enough detail to be able to trust that decision-makers have the interests of the public at heart, and not those of a specific group.

Highlight any independent oversight of decision-making, spending and outcomes.

Call attention to any performance audits.

Be candid about not only successes but also failures—and what lessons are learned from those experiences. The public will smell a glossy public relations effort; what they want is the plain truth.

Example: Caltrans Improvement Project

In coordination with the **California** State Transportation Agency (CalSTA) and an external review by the State Smart Transportation Initiative calling for bold reforms and a more modern department, Caltrans crafted a new mission and vision that is fully consistent with California's planning and policy objectives. Adopting a new mission was a critical step toward aligning Caltrans with state transportation planning and policy goals and better serving all Californians. This key change helps focus everyone at Caltrans on improved department performance, employee accountability and communications. Five workgroups have been formed to implement much broader reforms in the areas of: (1) performance and human resources, (2) smart investments. (3) strategic partnerships, (4) innovation and risk, and (5) communication. Learn more: www.dot.ca.gov/ctcip.

Figure 26: Caltrans Director Video Message 8/20/2014. http://www.youtube.com/watch?v=7V77rsxlQPg.

- *Report using plain language*

It isn't sufficient to evaluate and report outcomes merely to Congress, federal agencies, governors and legislatures, and state and local agencies. Ultimately, American taxpayers are footing the bill and the ones who want to know to what extent they are getting the outcomes they expect from their transportation investments.

In addition to more rigorous efforts, report directly to the public. Be succinct using modes of communication accessible to the general public free of jargon. Focus on outcomes that matter to the average family or small business. Leverage recognized and trusted officials to communicate: a governor, secretary of transportation, or mayor.

Example: Washington State DOT Gray Notebook Lite and Results WSDOT

The Gray Notebook is the **Washington** State DOT's quarterly performance and accountability report. Each edition features quarterly and annual updates on key agency functions and provides in-depth analysis of topics aligned with the agency's strategic plan emphasis areas as well as the state's transportation goals. The full version can run 50 pages or more. But a lite version aimed at the general public is only 4 pages long.[1] Learn more: http://wsdot.wa.gov/Accountability/GrayNotebook/navigateGNB.htm.

Results WSDOT, the agency's strategic plan for 2014–2017, provides the vision, mission, values, goals, priority outcomes and strategies to guide the work of the agency. An annual report summarized progress towards the goals of the strategic plan. Learn more: www.wsdot.wa.gov/about/secretary/results-wsdot.

Figure 27: Washington State DOT publishes the Gray Notebook Lite for the general public.

1 Washington State DOT, "Navigating the Gray Notebook," http://wsdot.wa.gov/Accountability/GrayNotebook/navigateGNB.htm.

References

This report builds on especially federal guidance on performance-based transportation decision-making:

- Federal Highway Administration. *Performance-Based Planning and Programming Guidebook*. 2013. See especially § 9 (Ongoing Monitoring, Evaluating, and Performance Reporting). www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook.

The following reference offers more guidance on reporting outcomes, especially to the public.

- Washington State Department of Transportation. "Performance measurement library." 2017. To help practitioners make effective comparisons of measures and reporting systems, WSDOT maintains a list of 51 state, commonwealth, and federal district transportation authorities and their online performance measurement and strategic planning mechanisms. www.wsdot.wa.gov/Accountability/Publications/Library.htm.

- Federal Highway Administration. *Transportation Management System Performance, Monitoring, Evaluation and Reporting*. 2005. This older reference intended for a transportation management system provides good guidance on monitoring, evaluation and reporting. https://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/tms_pmer_brochure.pdf.

GETTING STARTED

What steps do we take to achieve better outcomes for the public?

This report outlines an ideal four-phase process for delivering the transportation outcomes the public wants. Although various states and MPOs are successfully adopting some elements of this ideal process, none yet have embraced all elements. Fortunately, it isn't necessary to attempt all steps as once. Progress can be made incrementally.

Easier steps: Report outcomes to the public

To get started, understand what the public values—not merely the outputs of transportation investments (more roadway lane-miles, more transit service-hours, etc.) but the outcomes the public wants to see from those investments. See **Phase 1: Planning » Develop outcome measures that reflect local priorities**.

Next, begin measuring what matters to the public—not just with modeling before making investments but also on the ground after investments are in place. See **Phase 4: Reporting » Analyze outcomes and adjust expectations**.

Next, report to the public fairly and completely, if at a high level, how well current investments are achieving the outcomes the public wants. **Washington** State offers a good model. See **Phase 4: Reporting » Report returns on investments to taxpayers**.

The relatively easy act of reporting what outcomes are—and are not—being achieved can help to raise public awareness, shine the light on challenges and opportunities, and begin to provide public support for doing more to achieve desired outcomes.

Mid-term: Select investments that deliver outcomes

To go beyond merely reporting, in the next programming cycle, to the extent feasible within current constraints, evaluate potential projects by what outcomes they are expected to achieve. Strive to identify and fund the most cost-effective projects. **Virginia's** SMART SCALE is a good model. See **Phase 3: Programming » Make cost-effective investments to achieve desired outcomes**.

Next, you might find that the projects that are planned are not necessarily the ones that achieve desired outcomes cost-effectively. In the next planning cycle, focus on outcomes to develop a list of projects that are expected to most cost-effectively achieve desired outcomes. Over time, aim to align planning and programming more closely to focus on outcomes. See **Phase 1: Planning » Plan to achieve desired outcomes cost-effectively**.

Longer-term: Ensure governance and finance structures support achieving desired outcomes

Eventually, you may discover that existing governance and finance structures make it difficult to make the most cost-effective investments. If so, further progress will likely require reforms at higher levels of government to empower lower levels of government to focus on outcomes more.

Look to loosen constraints so that revenues can be used for the most cost-effective projects, regardless of jurisdiction or mode. Doing so may require a change in statute or even state constitutions. Make sure to link greater flexibility with greater accountability for achieving the outcomes the public wants. The series of reforms **Massachusetts** is pursuing offer a good model. See **Phase 2: Governance & Finance » Provide flexibility to make cost-effective investments**.

Next, if lower levels of government do not have sufficient authority to make the most cost-effective investments (even if underlying funding is theoretically flexible enough to allow doing so), it may be necessary for higher levels of government to provide such authority. Moreover, different jurisdictions, for example, that are parts of a MPO, may look to collaborate more effectively when greater accountability and transparency draw increased public scrutiny. See **Phase 2: Governance & Finance » Delegate investment decisions to policymakers with sufficiently broad authority**.

Finally, if funding mechanisms are seen as working against desired outcomes, look to adopt ones that align better with desired outcomes. For example, **Oregon** is looking to adopt road-price, a mechanism that is flexible enough to allow pricing to align better with various desired outcomes: congestion reduction, climate change, etc. See **Phase 2: Governance & Finance » Tie sources of funding to desired outcomes**.

Share best practices

MAP-21 is highlighting the need to focus more on outcomes. States and MPOs are serving as the laboratories of democracy, trying different approaches to see what works well in practice.

This report strives to point the way to a comprehensive approach to providing more “bang for the buck”: cost-effectively achieving outcomes the public wants and maintaining their trust. But for more details, see the examples and references.

Ultimately, especially in an era of limited resources, we all have reasons for making sure that transportation investments can be stretched further and do more to provide deliver results to the public. Let’s keep sharing with each other what works best.