

Measuring Performance in the Federal Transportation Program: A Path to Progress and Accountability





Transportation for America

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About Transportation for America

Transportation for America (T4 America) is the largest, most diverse coalition working on transportation reform today. Our nation's transportation network is based on a policy that has not been significantly updated since the 1950's. We believe it is time for a bold new vision — transportation that guarantees our freedom to move however we choose and leads to a stronger economy, greater energy security, cleaner environment and healthier America for all of us. We're calling for more responsible investment of our federal tax dollars to create a safer, cleaner, smarter transportation system that works for everyone.

Executive Committee

Smart Growth America (co-chair)
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The Need for a New Direction

As the United States Congress prepares to write a federal surface transportation law that could direct spending of as much as \$500 billion over the next six years, it is imperative that we set clear goals for this investment. The right transportation policy can help make our nation's economy more competitive globally, contribute to energy security, improve Americans' health and quality of life, promote social equity, improve safety and save money. Current policy, however, is falling short because it holds no one accountable for delivering on a clearly articulated national vision. As a result, projects too often are selected based on outdated notions and bureaucratic inertia.

The last two authorizations invested increasing sums in transportation without a corresponding improvement in conditions. Major metropolitan areas remain mired in congestion that seems to grow worse with every development decision, threatening our economic competitiveness and costing citizens' time and money. Indeed, households are spending an increasing share of their budgets on transportation. At the same time many Americans have been without viable travel options. Projects built under existing policies have yielded significant environmental damage and health problems from air pollution. Meanwhile, our vast network of aging roads and bridges is beginning to crumble under a federal system that does not ensure proper upkeep.

In a 2008 report, the Government Accountability Office (GAO) concluded:¹

“Billions may be needed to repair and upgrade the nation's surface transportation system so that it can safely and reliably meet current and future demands. *Yet large increases in expenditures for surface transportation in recent years have not commensurately improved performance* because current surface transportation programs are not effectively addressing key challenges, federal goals are numerous and sometimes conflicting, programs lack links to performance, and programs in some areas do not use the best tools and approaches to ensure effective investment decisions.” [emphasis added]

Although additional funding is needed to repair and upgrade our transportation system, in the current political climate it is unlikely that Congress will provide sufficient funding to meet the \$225 billion in annual needs projected by the National Surface Transportation Policy and Revenue Study Commission. This situation makes it imperative that we find ways to stretch each transportation dollar further.

This paper is intended to contribute to the conversation about transitioning to a performance-based transportation program. A full transition will take time, but there are steps that can be implemented by the 112th Congress to begin this transition now.

1 Government Accountability Office. “Funding the Surface Transportation System”. www.gao.gov/highrisk/risks/efficiency-effectiveness/funding_transportation.php

Establish National Objectives for Transportation Investment

The key to developing a performance-based system is linking transportation investment to broader goals. Recognizing the widespread impacts transportation has on our communities, Congress should establish a small set of clearly defined national transportation objectives that consider access to jobs and services, economic competitiveness, energy consumption, social equity, quality of life, health and the environment. While Congress should establish expectations and incentives toward these outcomes, we recommend that states and regions be given flexibility to determine how best to make progress toward them.

At the same time, Congress should take the opportunity with the current authorization to refocus the transportation program and associated bureaucracy by reducing the number of programs and ensure that each corresponds to a small set of national objectives.

Transportation for America, in conjunction with industry leaders, partner organizations and experts, developed a recommended suite of national goals and objectives that reflect the crosscutting importance of our nation's transportation system to the nation. Appendix A describes Transportation for America's recommended National Transportation Objectives in more detail and the rationale for why each is necessary.

National Transportation Objectives Proposed by T4 America



Reduce per capita delay	Increase percentage of population living in areas that meet ambient air quality standards
Reduce per capita Vehicle Miles Traveled (VMT)	Increase access for vulnerable populations
Reduce motor vehicle-related crashes, injuries and fatalities	Reduce average household transportation cost
Reduce transportation-related oil use	Increase share of highways, transit systems and other infrastructure in a state of good repair
Increase walking, bicycling and public transportation usage	

How is the system working today?

As a nation, we are spending more and getting less out of our aging transportation system. The results are borne out in the numbers:

- Nearly 34,000 people are killed each year on U.S. roads – close to the equivalent of a 737 airliner crashing every weekday – and approximately 2.2 million people are injured every year.² The economic cost alone of these traffic-related tragedies is estimated at \$230 billion annually. The American Automobile Association estimates that crashes impose a “tax” of \$1,050 on residents annually;³
- Traffic congestion is harming commerce and productivity around cities and along freight corridors across the U.S. With demand for freight transportation expected to double by 2035, failure to address this congestion adds to the cost of goods movement and threatens America’s economic competitiveness;⁴
- The typical rush-hour commuter spends a full work week stuck in traffic each year, totaling 4.2 billion hours, 2.8 billion gallons of wasted fuel, and a direct cost of \$87 billion⁵ without considering the broader economic, environmental, and quality of life impacts;

- Low and moderate income households, including those who live in rural areas, spend about 42 percent of their total annual incomes on transportation;⁶
- Americans living within 1,000 feet of major highways are more likely to have asthma, leukemia and cardiovascular disease;⁷
- The transportation sector is responsible for 70 percent of the oil consumed in America⁸ and contributes nearly one-third of U.S. carbon dioxide emissions;⁹
- The U.S. population is growing and aging, exacerbating an already strained system. More than half of non-driving senior citizens report staying home because they lack adequate transportation¹⁰ – by 2050, more than one in five Americans will be over the age of 65,¹¹ increasing the need for more transportation options;
- Federal gas tax receipts can no longer generate sufficient revenue to sustain current funding levels, requiring multiple general fund infusions to the Highway Trust Fund to maintain current spending levels;

2 National Highway Traffic Safety Administration. “Traffic Safety Facts Research Note - Highlights of 2009 Motor Vehicle Crashes”. August 2010. Available <http://www.nrd.nhtsa.dot.gov/Pubs/811363.pdf>.

3 Cambridge Systematics. “Crashes vs. Congestion: What’s the Cost to Society?” March 2008.

4 American Association of State Highway and Transportation Officials. “Unlocking Freight.” 2010.

5 Texas Transportation Institute. “2007 Urban Mobility Report.” September 2007.

6 The Bureau of Transportation Statistics, Consumer Expenditure Survey, Transportation Statistics Annual Report, 2000, www.bts.gov In http://www.publictransportation.org/reports/asp/mobility_rural.asp

7 Bullard, R.D. (2005). *Environmental Justice in the Twenty-first Century: The Quest for Environmental Justice*. Sierra Club Books. San Francisco, California.

8 U.S. Energy Information Association. “Annual Energy Review: U.S. Primary Energy Consumption by Source and Sector.” 26 July 2009.

9 U.S. Energy Information Association. “U.S. Carbon Dioxide Emissions from Fossil Fuels Virtually Unchanged in 2005 as Price Increases Dampen Energy Demand.” 2006.

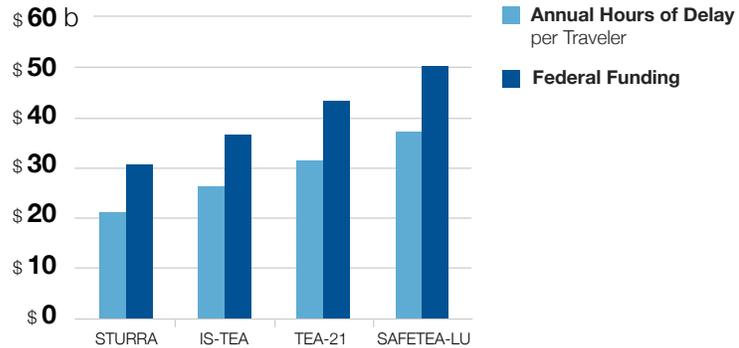
10 American Public Transportation Association. “Expanding the Transportation Options in an Aging Society.” 2006.

11 U.S. Census Bureau. “Future Projections.” 2000.

Buying More, Getting Less

Despite a two-thirds increase in federal transportation spending, congestion in urban areas has increased by approximately 75 percent between 1987 and 2005, demonstrating the need for a new direction.

Federal Investment and Congestion
in Billions of Dollars



- The lack of options imposes significant costs on American families: Households living in areas that are automobile-dependent spend an average of 25 percent of their income on transportation compared with 9 percent for households that live in areas well served by public transit;¹²
- Across the nation, drivers face more than 90,000 miles of crumbling highways and more than 70,000 structurally deficient bridges. The American Society of Civil Engineers awarded the condition of the nation's bridges a "C" grade and roadways a near-failing "D-" grade in 2009.

Who is calling for accountability?

As several blue-ribbon review commissions have concluded in recent years, there are myriad ways to improve the return on our investment in infrastructure, and that need becomes ever more urgent as the United States struggles to regain our economic primacy.

Congress created two national commissions in 2005 charged with evaluating the current program and making recommendations for a new direction in transportation policy. The Commission findings were intended to provide insights and recommendations to be discussed and included in the reauthorization of SAFETEA-LU.

The two commissions are:

- National Surface Transportation Infrastructure Financing Commission:
<http://financecommission.dot.gov/>
- National Surface Transportation Policy and Revenue Study Commission:
<http://transportationfortomorrow.com/>

In addition, numerous other organizations, including the U.S. Government Accountability Office (GAO), and the Congressional Research Service (CRS), the Miller Center for Public Affairs and the Brookings Institution, have also published analyses of the current situation.

While the recommendations and policy solutions put forth by these groups vary somewhat depending

¹² Scott Bernstein. "Redefining Affordability." Center for Neighborhood Technology. 27 January 2010.

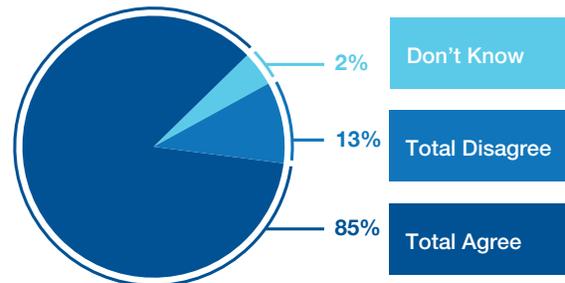
Transparency Equals Trust: Lessons from the Local Level

Though the United States faces significant infrastructure investment needs, Americans do not believe their tax dollars are spent wisely. A recent poll found that 85 percent of citizens believe that transportation investments are based on politics instead of merit.

Experience at the local level shows that when citizens understand the goals and objectives of an investment program, as well who is accountable for delivering results, they are more likely to be supportive. This is borne out at the ballot box: A review of transportation funding measures in the 2000s found that 70 percent were successful, especially when there was a specific list of projects balanced between public transportation and roads.¹

Politics or Need?

Public response to the following statement: Transportation infrastructure funding decisions are based more on politics than on need



on the focus and intent of their work, there is widespread consensus that the current system isn't meeting our country's needs and that we must dramatically reform current federal transportation policies and programs.

As participants in the David R. Goode National Transportation Policy Conference noted in "Well Within Reach: America's New Transportation Vision:"

A system launched with a bold and historic vision is now characterized by pork and political opportunism. Financing models that once served America well are no longer sustainable. Funding from the American Recovery and Reinvestment Act will add capacity in some communities and

will bring other elements of the system into a state of better repair, but will not provide the efficient, scalable, state-of-the-art transportation system necessary to drive future economic growth. What is needed is nothing less than a fundamental overhaul of America's transportation policies and programs.¹³

¹³ Miller Center for Public Affairs. Well Within Reach America's New Transportation Agenda. David R. Goode National Transportation Policy Conference Norman Y. Mineta and Samuel K. Skinner, Conference Co-Chairs and former Secretaries of Transportation. Jeffrey N. Shane, Conference Director

Developing a Performance-based Transportation Program

Broadly speaking, here is how a performance-based program might work:

The overarching principle is that states and regions would be expected to make sound, strategic investment plans. They would be given incentives – not a mandate – to demonstrate that their spending of federal dollars over time does not allow conditions to deteriorate, but instead improves them. The most important incentive would likely be access to a pot of funds that offers the most hands-off flexibility; states and regions that are good performers toward self-identified targets would be given wide latitude in how they invest federal dollars.

Assuming that Congress adopts a set of national objectives in the authorization, the first step toward implementation would be for the states to assess where they are today on relevant benchmarks and establish a baseline. States and regions would then set targets for themselves that would allow them to maintain or improve on those benchmarks over 20 years. For example, a state might set statewide targets for bridge and pavement conditions or for delay per driver. States would work cooperatively with the larger regions to determine how each would contribute to meeting the targets.

As they are today, larger regions would be expected to create 20-year long-range plans. The difference here is that they would be asked to account for a wider range of outcomes than today's somewhat narrow focus. Rather than model a single scenario, regions would be expected to follow the example

of well-run businesses and examine the costs and benefits of a range of scenarios, and then choose the one that best fulfills the local and state vision. The scenarios should make progress towards the 20-year targets set by the states and regions.

States and Metropolitan Planning Organizations (MPOs) would create a five-year implementation program – similar to today's Transportation Improvement Plans – that articulates both projects to be built and strategies to be employed. Midway through those five years, and at the end of that period, states and MPOs would use their models to examine what actually was built in the region – both transportation and development – and evaluate whether the trend line is still heading in the right direction. Those making progress toward their targets would be rewarded with continued flexibility, and potentially, access to discretionary funds.

The transition to a performance-based transportation program will be a significant challenge and cannot happen all at once. It will require a series of concerted steps over several years that must begin with this year's authorization.

Step 1. Establish Baselines and Targets

In order to measure progress toward national goals, states and regions must first establish baseline conditions for all the relevant benchmarks. Some

of these benchmarks – such as hours of delay per capita and air quality measures – already are well documented, while some are not always tracked by states and regions.

We recommend that the next authorization direct U.S. DOT to spend the first 18 months working with six interested pilot states and localities to develop and test various methods of analysis and reporting, and review characteristics of quality travel demand models and public engagement. Congress should allocate a small pot of money for the purpose of assisting these states and localities in this effort.

Going forward, U.S. DOT would provide states and regions with funding to analyze current performance for each of the national transportation objectives. In addition, U.S. DOT would help states and regions upgrade and improve their travel demand models, data collection procedures and analysis tools.

The goal should be to ensure that states and localities can model and track factors such as safety, accessibility, traffic congestion management, social equity and energy usage. Recognizing that the target setting process will evolve and improve

Performance Based versus “Dashboard” Approaches

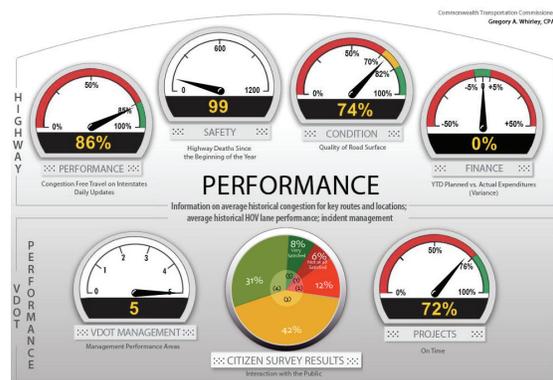
Many states are starting to implement performance management systems to track the efficiency of their operations. These systems typically measure how well a state department of transportation is performing on business and engineering practices and sometimes display information to the public through an interface that resembles a car’s dashboard. These systems help citizens and decision-makers understand how well a department of transportation is functioning as an organization.

The Virginia and North Carolina Departments of Transportation, for instance, track the percentage of projects that are completed on-time and on-budget. Other states track customer satisfaction, pavement condition, fatalities and the duration of incidents.

While these measurements are an important start – additional measures are needed. The existing approaches do not, for instance, focus on how future investments impact the performance of the transportation system.

A business analyzes whether its internal operations are functioning well and develops strategic plans for expansion. While state departments of transportation measure their internal operations, their investments play a large role in our economic competitiveness, quality of life and health. States and regions need to start considering these goals and outcomes as they plan and invest in transportation improvements.

Virginia Department of Transportation's Dashboard (www.dashboard.virginiadot.org)



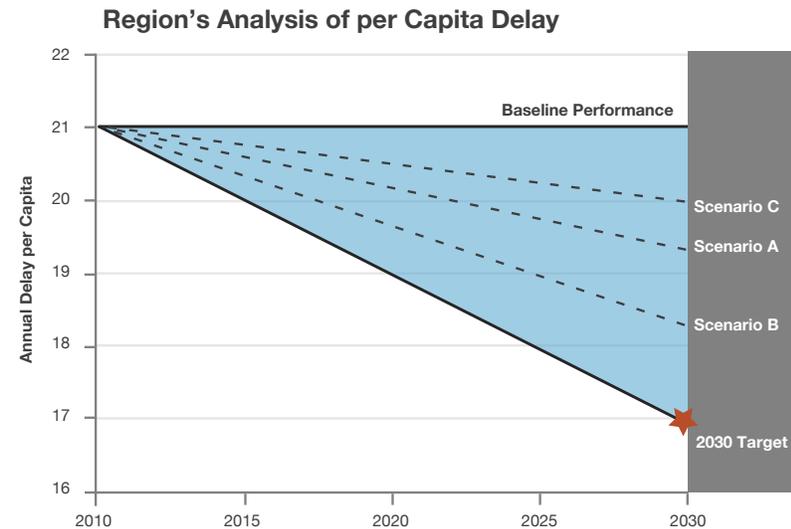
over time, there are no penalties for not meeting local targets – only incentives for making progress towards targets.

Step 2. Strategic Investment Plans

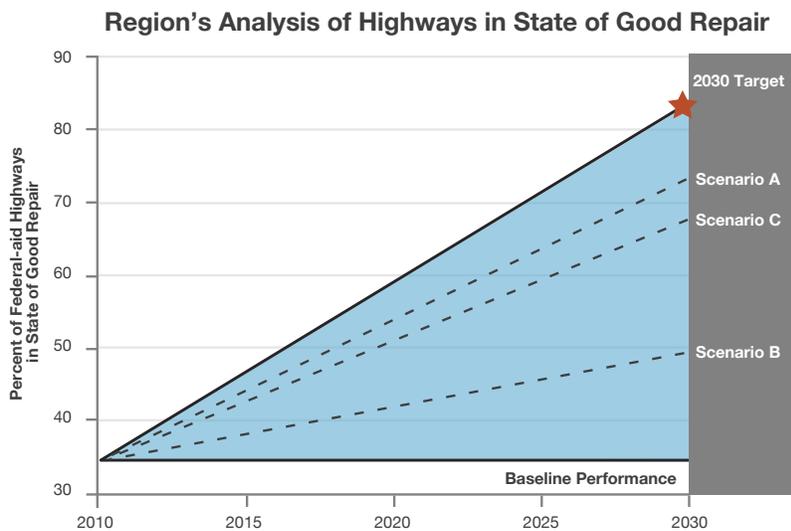
Today, states and regions engage in making “long-range” plans that have been described as little more than stapling exercises, collections of wish lists submitted by the various jurisdictions. The analysis of these “plans” generally consists of projecting

status-quo trends into the future, rather than evaluating how different building and development scenarios might affect those trends. The results are more of the same – the same unavoidable congestion, the same lengthening commutes, the same freight bottlenecks – and missed opportunities to make the most of taxpayer investments.

Thinking like a business: Scenario plans. Several states and regions in recent years have recognized the shortcomings of the current approach and have begun to make use of scenario planning, allowing



By analyzing several scenarios as a part of the development of long-range transportation plans, states and regions can help citizens and elected officials make better informed decisions. These graphics demonstrate the type of information that could be presented to citizens by states and regions.



In this example, scenario A does a better job of repairing existing highways while scenario C does a better job of reducing delay. Today, many transportation plans are developed without providing information that can help citizens and elected officials understand the trade-offs between different scenarios and decide what their community wants for the future.

them to project the effects of several different sets of plans and accompanying policies. This kind of strategic planning looks at several scenarios for future travel demand and transportation investments to determine their impact on objectives that are important on the regional, state and national scales. After ample vetting with citizens and stakeholders, the state and local leaders select a scenario based on what best meets the needs of the community, considering factors like congestion, cost of infrastructure, pollution and access to jobs.

This type of analysis is similar to the process used by the private sector. When developing long-term expansion plans, businesses rarely assume economic trends, competitors, supply chains and other factors will remain static over a 20-year period. Rather, they analyze various scenarios using different expansion plans, economic trends and other factors to better understand how potential courses of action would affect their future growth and profitability. Citizens expect similarly prudent analysis before their tax dollars are invested in our transportation system.

With a typical 20-year timeframe, long-range transportation plans would not include every specific project. Rather the plans would assess the region's potential growth and development patterns, articulate a community vision, and lay out transportation investment strategies and development trends to achieve that vision.

Incentives rather than penalties. To encourage states and regions to create and implement smart plans, Congress should authorize a special subset of federal funds as thoroughly flexible funds that could be offered to states and regions whose plans maintain or improve performance. Projects emerging from

these plans also could be eligible for additional funding through U.S. DOT discretionary grant programs. There may be unique circumstances that make it unfeasible for a particular state or region to meet their performance targets. States and regions would not lose money in such a circumstance, but may have reduced programmatic flexibility.

Five-year implementation plans. Once long-range plans are completed, state and local entities would create a five-year implementation plan detailing how they intend to spend federal funds. These plans would serve as the implementation plan for the state or region's strategic long-range plan and could over time replace existing requirements. A state or region's 5-year implementation plan would indicate the progress they expect to make towards their 20-year performance targets.

Step 3. Analysis and Reporting

In order to monitor performance, data must be measured in clear language appropriate for a variety of audiences, including planners, engineers, policymakers, and most importantly, the general public. While states currently report information to U.S. DOT pertaining to funding and the condition and performance of bridges, highways and transit systems, this is not enough information to provide citizens with a full picture of the broader impacts of the transportation system.

Over the five-year period covered by the implementation plan, progress towards locally adopted objectives will be measured using data and modeling. As part of the transitioning phase,

states and regions would determine the specifics of how they will measure progress using their travel demand models. As we learn from experience, DOT should later determine which methods for measuring different goals work best and strongly encourage states and regions to use the identified methods.

Reporting of progress would occur twice during each implementation plan – at the mid-point and at the end of the plan. The reports should include analysis related to the overall impacts from both transportation investments and other influencing factors. States and regions would be encouraged to collect additional ‘real-time’ information to better understand the complex relationships between decisions made by various levels of government and to identify potential indicators for monitoring improvement. See Appendix C for more information about what indicators states and regions are using to monitor their progress.

Step 4. Implementing Accountability

Over the long term, a performance-based transportation system should help improve decision-making and investment processes by emphasizing broad outcomes and collaboration among various levels of government over short-term targets. Simply reporting data, publishing strategic plans, and preparing reports can engage the general public and policymakers, but does not necessarily lead to changes in decision-making unless a feedback loop is formalized.

States and regions reporting progress towards their interim performance objectives would be rewarded preference in national discretionary grant programs and continued access to flexible federal funding programs. States and regions whose reporting does not show progress towards their locally adopted targets would have less flexibility and less access to discretionary grants.

Federal transportation authorizations, which typically occur every five to six years, allow for this process to be continually evaluated and for changes to be made to increase overall accountability and efficiency. As the capacity of states and regions grows and decision-making transparency increases, the performance-based system will continue to evolve.



Implementation of National Transportation Objectives

Congress establishes national transportation objectives



U.S. DOT provides funds to states and regions to analyze baseline conditions and improve modeling capacity. States develop state-specific targets for each objective, and states and regions cooperatively develop regional targets.



States and regions develop performance-based long-range plans analyzing several scenarios. Adopted plans would maintain or improve baseline conditions for each objective.



States and regions develop five-year implementation plans that make progress towards their locally adopted targets. U.S. DOT provides multimodal funding and flexibility to transportation agencies to implement these plans.



States and regions send U.S. DOT an assessment of progress towards locally adopted targets both midway and at the end of their implementation plans.



If progress is made toward locally adopted targets, U.S. DOT continues to provide multimodal funding and preference in national discretionary grant programs.

If progress is not made toward locally adopted targets, U.S. DOT restricts funding flexibility to specific purposes.

Potential Challenges in Implementation

The transition to a performance-based transportation system will be challenging. First, we must establish targets despite the absence of a significant and uniform set of existing data. Second, the set of outcomes to be tracked have traditionally been seen as beyond the control of most transportation agencies.

Broad support exists for developing a more performance-based approach to transportation investments. Yet this overarching consensus runs into a particularly difficult question: How can we hold institutions accountable for improving performance if we do not currently collect the very data we want to measure them by?

In lieu of using actual data, transportation agencies can employ a variety of methods to analyze how transportation investments and other influencing factors impact progress towards national goals. For example, the Metropolitan Transportation Commission in the San Francisco Bay Area,¹⁴ the Thomas Jefferson Planning District Commission in central Virginia¹⁵ and the Coalition for Utah's Future in the Greater Wasatch Area of Utah¹⁶ have all conducted scenario planning that analyzed various transportation strategies and land development patterns using travel demand models.

The table below, derived from the Eastern Planning Initiative completed by the Thomas Jefferson Planning District Commission in central Virginia,

	Congestion	Infrastructure Costs	Annual Fuel Consumption (billions)	Water Quality
Scenario A – Business as Usual	44 percent	1,000M	155	Poor
Scenario B – Town Centers and Enhanced Suburban	27 percent	500M	121	Good
Scenario C – Urban Core	20 percent	500M	110	Good

14 Metropolitan Transportation Commission. "Transportation 2035- Change in Motion." Available: http://www.mtc.ca.gov/planning/2035_plan/

15 Thomas Jefferson Planning District Commission. "Jefferson Area Eastern Planning Initiative." Available: <http://www.tjpd.org/community/epi.asp>

16 Envision Utah. "The Quality Growth Strategy." Available: http://envisionutah.org/eu_about_eu_qualitygrowthstrategy_main.html

compares the impact of the three scenarios analyzed across a set of broad outcomes.¹⁷

Other regions could use a similar process during the transition to a performance-based transportation program. This will provide states and regions the ability to measure the impact of their decisions on national goals over a 20-year period without requiring significant new data collection and analysis in a short period of time, which would be necessary if actual indicators were used to measure ‘real-time’ progress. We also recommend that U.S. DOT establish a baseline set of characteristics for integrated travel demand models and develop a grant program to work with state and local government to upgrade and improve their models.

Over time – as the data necessary to allow for real-time analysis of performance is identified and collected – the federal program could shift from the use of modeling to combination of modeling and actual data. In addition, as states and regions become more comfortable with the structure and processes of a performance-based transportation program, U.S. DOT would begin to reward states and regions that perform well.

The national transportation objectives established by Congress should cover a range of outcomes that are influenced by transportation investment decisions. State DOTs and MPOs have broad control over transportation investment decisions, but in some instances, do not control other factors that can influence the degree of progress they can make towards some of the objectives.

For example, the objective of reducing traffic crashes is heavily influenced by driver behavior, which transportation agencies cannot directly control. Agencies can, however, create incentives for better behavior behind the wheel through improved street designs standards, public education campaigns and cracking down on distracted driving.

In another case, overall vehicle miles traveled are influenced by both travel demand strategies and by local land use decisions. In these instances, MPOs and State DOTs can work to improve the coordination between their transportation investments and local land use decisions such as informing local decision makers of the potential impacts various land use proposals would have on the transportation network and on investments in options like transit, vanpools, and local street networks.

Although transportation agencies cannot control all outcomes, we cannot continue tolerating poor cooperation between various levels of government to overwhelm our transportation network.

17 Thomas Jefferson Planning District Commission. “Jefferson Area Eastern Planning Initiative.” Available: <http://www.tjpd.org/community/epi.asp>

Conclusion

Since the 1950s, the US transportation system has been dominated by a funding approach and program structure that was designed to construct the Interstate highway system. This program structure was largely successful at achieving that goal. Now, as we work to move the nation into the 21st century, the American people need more options for getting around and we must ensure the best use of limited funds. Our policy must become more performance-driven, more directly related to a set of clearly articulated goals and more accountable for results.

The transition to a performance-based system will require a national commitment. We need to spend more on the nation's transportation infrastructure, but we must also spend wisely. Investments should be targeted towards those programs that will bring the greatest public benefits and the greatest returns, in terms of critical national goals, such as economic growth, national connectivity, metropolitan accessibility, social equity, energy security, public health, environmental sustainability, and safety. As Congress considers a fresh authorization, it is time to fight for real reform that achieves the results the American people deserve.

Appendix A.

Measuring Progress Toward National Objectives

1. Reduce per capita delay

Per capita delay helps measure how well the transportation system is facilitating the movement of goods and providing options for users to meet their daily needs. According to the Texas Transportation Institute, from 1982 to 2005, the annual cost of the extra time and fuel wasted in congestion rose from \$15 billion to \$78 billion in 2005 dollars. Yearly delay for those who drive during peak periods was 38 hours in 2005 – almost one week of vacation – an increase from 14 hours in 1982. Transit riders saved drivers approximately 340 million gallons of gasoline in 2005.¹⁸

2. Reduce per capita Vehicle Miles Traveled (VMT)

Smart planning and development practices should allow Americans to do more while driving less, on average. Per capita vehicle miles traveled is one measure of success in that area and can serve as one benchmark for the level of coordination between transportation investments and local land use. Since 1980, the miles Americans drive has grown three times faster than the U.S. population,¹⁹ and

almost twice as fast as vehicle registrations.²⁰ The number of miles each American drives grew not because people simply chose to spend more hours in traffic, but because land-use patterns required it and few, if any, options were provided. We can and must improve on that over the next 30 years.

3. Reduce motor vehicle-related crashes, injuries and fatalities

This measure is directly linked to the objective of ensuring safety for all transportation users, and specifically aimed at the most dangerous of our transportation modes. Traffic crashes take a significant toll on Americans. Over the last two decades, traffic deaths have averaged over 43,000 per year, 5,000 of which involve bicyclists or pedestrians. Motor vehicle crashes are the leading cause of death for Americans aged three to 33, and nearly 2.5 million people are injured on our roads each year. In 2008, there were more than 5.8 million total traffic crashes in America.²¹ These crashes have tremendous negative effects on our nation's economy. According to research conducted for the American Automobile Association (AAA), auto accidents cost each American more than

18 Texas Transportation Institute. (2006) "Urban Mobility Report. 2005." http://tti.tamu.edu/documents/ums/mobility_report_2005_wappx.pdf

19 Federal Highway Administration. (2009) "Travel Monitoring: Historical Monthly VMT Report." U.S. Department of Transportation. <http://www.fhwa.dot.gov/policyinformation/travel/tvt/history/>

20 U.S. Census Bureau. (2009) "Population Estimates: 1980s." <http://www.census.gov/popest/archives/1980s/>

21 National Highway Traffic Safety Administration. (2009) "2008 Traffic Safety Annual Assessment." Highlights available at: www-nrd.nhtsa.dot.gov/Pubs/811172.pdf

\$1,000 a year. Traffic crashes, in total, cost the U.S. economy \$164 billion annually.²²

4. Reduce transportation-related oil use

In 2009, the US consumed 19.5 million barrels of oil per day, with the transportation sector accounting for more than 70 percent of this use and almost a third of all carbon emissions. Reducing per capita oil use would have a dramatic impact on our nation's energy security, potentially allowing the United States to import 50 percent less oil each year. In addition, the transportation sector has the second highest amount of carbon emissions and historically has been the fastest growing contributor of greenhouse gas emissions.

5. Increase walking, bicycling and public transportation usage

After declining for several decades, walking and bicycling are growing in popularity in many areas of the country. Providing safe and convenient active transportation options can help meet this demand, reduce injuries and death from accidents and help Americans get more exercise and keep obesity in check.²³ Forty percent of all trips are in the United States are two miles or less. Increasing the share of trips taken by non-motorized means can yield

substantial reductions in congestion, provide for energy savings, improve air quality, and lower carbon emissions. Increased use of higher capacity bus and rail transportation systems will similarly reduce energy consumption and emissions.²⁴

6. Increase percentage of population living in areas that meet ambient air quality standards

Transportation sources are among the largest contributors to the most widespread and dangerous air pollutants in the United States. Carbon monoxide and certain oxides of nitrogen are directly emitted in vehicular exhaust and thus may have high concentrations in proximity to transportation infrastructure. The Clean Air Act requires every county in the nation to reduce air pollution to limits known as national ambient air quality standards established by the Environmental Protection Agency. Exposure to air pollutants can cause premature death and respiratory disorders, aggravate existing lung problems, trigger heart attacks and strokes and has been implicated in causing and worsening asthma. Approximately 175 million Americans live in counties with unhealthy levels of air pollution.²⁵ Low-income and minority populations are disproportionately impacted by air pollution.²⁶

22 American Automobile Association. (2008) "Crash vs. Congestion – What's the Cost to Society?." Prepared by Cambridge Systematics, Inc.. <http://www.aaanewsroom.net/main/Default.asp?CategoryID=7&ArticleID=596>

23 Finkelstein EA, Trogon JG, Cohen JW, et al. "Annual Medical Spending Attributable to Obesity: Payer- and Service-Specific Estimates." *Health Affairs*, 28(5): w822-w831, 2009

24 Guide to Community Preventive Services. Center for Disease Control and Prevention. <http://www.thecommunityguide.org/pa/environmental-policy/communitypolicies.html>

25 State of the Air 2010. American Lung Association. www.stateoftheair.org

26 National Institutes of Health Toxicology and Environmental Health Information Program. "Environmental Justice: A Bibliography with Abstracts: 1990-1997." June 1997.

7. Increase share of highways, transit and other infrastructure in a state of good repair

The quality of roads, bridges, public transportation fleets, and bicycle and pedestrian facilities is deteriorating due to under-investment in maintenance, as detailed by the National Surface Transportation Policy and Revenue Commission. In addition, many roads and bridges with significant non-motorized use do not include safe facilities for non-motorized travel. It is critical that we appropriately maintain our existing transportation infrastructure. This measure focuses on attaining a national level of State of Good Repair for these essential infrastructure elements. Currently, 33 percent of America's major roads are in poor condition and 31 percent of our bridges are structurally deficient or functionally obsolete.²⁷ The 2008 National Surface Transportation Policy and Revenue Commission projects that \$78.8 billion is needed annually to restore and keep our highways and bridges in a state of good repair. The Federal Transit Authority (FTA) rates system conditions on a five-point scale, 1 being poor and 5 being excellent. The estimated average condition of the urban bus fleet was 3.08 in 2004, a slight improvement from 3.07 in 2000.²⁸ More than 50 percent of rural transit fleets are past their expected lifespan.

27 American Society of Civil Engineers. (2009) "Report Card for America's Infrastructure." <http://www.infrastructurereportcard.org/report-cards>

28 National Surface Transportation Policy and Revenue Study Commission. (2007) "Transportation for Tomorrow." http://transportationfortomorrow.org/final_report/

8. Reduce average household transportation costs

Transportation is the second highest annual expenditure for the average American household, and the poorest fifth of Americans spend more than twice the national average, or 42 percent of their annual household budget, on the purchase, operation, and maintenance of automobiles.²⁹ While transportation itself does not have a direct impact on housing costs, the general practice of "driving to qualify" is well documented. Due to the disproportionate burden of transportation costs on those least able to afford them, coordinated strategies that incorporate land use planning are necessary to reduce transportation's impact on combined costs.

9. Increase access for vulnerable populations

This measure will improve accessibility by increasing the number of transportation options available to low-income and minority populations. An equity analysis for elderly, disabled and low-income communities will help ensure that these populations can share the benefits of federal transportation investment without bearing a disproportionate share of the burdens. Creating a national transportation performance measure on equity ensures federal environmental justice policies and standards are met. In too many of our communities, the only safe and convenient option

29 Surface Transportation Policy Project. "Transportation and Poverty Alleviation." Accessed 2010.

Americans have for accessing essential goods, services and experiences is a personal automobile. Nationally, 96 percent of passenger miles traveled were in cars or light trucks in 2005. Only half of U.S. households have access to any sort of public transportation system near their residence. Many communities have been designed without places to walk or bicycle safely. Intercity rail and bus services in many places are anemic, making automobile travel a necessity rather than a choice.

Appendix B.

Elements of a Successful Performance-based System and Case Studies.

A 2010 report assessed four countries – Australia, Great Britain, New Zealand, and Sweden – with mature performance management systems. The report examined how these agencies use goal setting and performance measures to manage, explain, deliver, and adjust their transportation budgets and internal activities. Across these diverse countries, the following concepts are being deployed:³⁰

- Articulate a limited number of high-level national transportation policy goals that are linked to a clear set of measures and targets.
- Establish policies or negotiate agreements on how regional and local agencies will achieve the national goals while translating them into local context and priorities.
- Evaluate performance by tracking the measures and reporting them in clear language appropriate for the audience.
- Collaborate with regional and local agencies to achieve the targets by emphasizing incentives, training and support as the preferred strategy for advancing performance.
- Perpetuate long-term improvement by understanding that the real value of performance management is the development of an improved decision-making and investment process.

As the U.S. begins its transition to a performance-based transportation program, these examples can help inform decision-makers and advocates on how to make it work.

Case Study: Japan³¹

The Japanese government has provided national leadership in the development of a performance-based decisions making system, overseeing a relatively quick implementation of a nationally cohesive system. A 2002 national law mandated that the national government agencies including the Ministry of Land, Infrastructure, and Transportation (MLIT) adopt a performance-based planning approach. Japanese law requires that the MLIT, the primary national government agency for transportation, establish a plan for achieving performance targets in several infrastructure areas, including roads, railroads, ports, navigation channels and flood control and coastal conservation.

The MLIT developed a plan identifying short-term performance targets for 2007 and long term targets for 2020. They also established 17 performance indicators that apply to all transportation entities, prefectures and regional offices in Japan. The MLIT created a Performance Management Office

30 Linking Transportation Performance and Accountability. Federal Highway Administration. International Technology Scanning Program. January 2010

31 Federal Highway Administration. "Transportation Performance Measures in Australia, Canada, Japan, and New Zealand." International Technology Exchange Program. December 2004

tasked with monitoring the progress of MLIT performance measurements.

Each prefecture worked with MLIT to develop a performance-based plan based using the 17 performance indications. By March 2004, 31 of 47 prefectures had established their own performance indicators and a total of 80 additional measures.

Lesson Learned: With technical support and coordination, state and local agencies can implement national goals quickly and effectively.

Case Study: ISTEAs Management Systems³²

In 1991, Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA). The law included provisions for a performance-based transportation program, requiring state DOTs to develop and implement management systems for: (1) the pavement of federal-aid highways; (2) bridges on and off federal-aid highways; (3) highway safety; (4) traffic congestion; (5) public transportation facilities and equipment and (6) intermodal transportation facilities and systems.

The law required U.S. DOT to develop regulations determining how states would implement each of the six management systems. State DOTs were to develop the systems in cooperation with metropolitan planning organizations in urbanized areas and the affected agencies receiving assistance under the Federal Transit Act. Full implementation of the management systems was required during

a five-year period. The law required U.S. DOT to withhold up to 10 percent of federal surface transportation funds from any state that failed to comply.

“Management systems are tools that provide information to assist state and local decision makers in selecting cost-effective policies, programs, and projects to improve the efficiency and safety of the nation’s infrastructure and protect the public’s investment in it.”

GAO: Transportation infrastructure: States’ Implementation of Transportation Management Systems

More than 200 states and MPOs commented on the proposed interim rule-making developed by the U.S. DOT. Although many of the comments expressed support for the idea of management systems, concerns included: “The data requirements would be too burdensome; the rule was too prescriptive, not allowing states enough flexibility to tailor the systems to their individual circumstances; and the time frames for compliance were too short.”

These concerns, coupled with other political pressures, led to provisions in the National Highway System Designation Act of 1995 making the implementation of management systems optional, except for congestion management, and prohibited the U.S. DOT from withholding funds from states.

The decision to make the management systems optional resulted in decreased federal support and guidance for the development and implementation of the management systems. A 1997 General Accounting Office report titled, *Transportation infrastructure: States’ Implementation of Transportation Management Systems*, discussed the

32 General Accounting Office. “Transportation infrastructure: States’ Implementation of Transportation Management Systems,” January 1997.

proposed management systems and documented the effects of the enactment of the NHS Act had on implementation of management systems. States were left to develop their own systems with little assistance and, as a result, many scaled back or discontinued efforts all together.

Lessons Learned: First, there must be a transition to a performance-based system that allows for flexibility in program structure and the ability to learn from missteps. Second, absent federal support and resources, states are less likely to develop and implement necessary systems.

Local Flexibility and Control

By focusing on national outcomes, states, regions, and local governments can translate the established goals to match local context and priorities. A performance-based system empowers regions to shape their future by giving them more direct funding and decision-making authority, and in turn, holding them accountable for delivering results.

Under the current transportation funding framework, the federal government pre-determines the ‘means’ available to a state or region by putting in place funding silos with limited multimodal, corridor or geographic flexibility. In the United States, different levels of government play a role in allocating transportation funds, each with varying responsibilities and levels of authority, which can hinder collaboration toward broader goals. Under a performance-based system, the federal government can increase the level of funding, authority and flexibility afforded to states and regions across the country, while tying increased authority and

flexibility for a state or region to making progress towards locally adopted goals based on national outcomes.

Lesson Learned: A successful model must ensure that states and local governments that are given increased authority must also be given flexibility on the means to achieve outcomes as well as support and assistance to implement new programs.

Case Study: Regional Transportation and Land Use Performance Measures

The Commonwealth of Virginia has struggled for several years with how to fund its transportation needs, prompting the Governor in 2007 to work with the legislators on a compromise transportation proposal that included three key components: (1) new funding; (2) improved accountability and transparency; and, (3) improved coordination between transportation and land use planning.³³

The law created regional funding authorities in Northern Virginia and Hampton Roads and required each to develop transportation and land use performance measures. These measures were meant to improve accountability in project selection and improve the coordination between transportation and land use. The measures were part of the trade-off for the regions receiving increased funding. The measures were required to include but were not limited to the following: congestion reduction and safety; transit and high-occupancy vehicle usage; job-to-housing ratios; job and housing access to transit and pedestrian facilities; air quality; and per capita vehicle miles traveled.

33 HB3202. <http://www.hb3202.virginia.gov/>.

While the State's Supreme Court later ruled the regional funding authorities unconstitutional, the legislature passed these requirements onto each region's metropolitan planning organization in 2009, but did not replace the lost funding stream.³⁴ Despite the legal requirement to develop regional transportation and land use performance measures, neither metropolitan planning organization has acted to develop or adopt the measures.

Lessons Learned: Governments must have the resources and incentives to implement a performance-based program.

Case Study: Great Britain Public Service Agreement

Great Britain uses public service agreements with local governments to implement national goals. The agreements consist of objectives and targets, strategies to achieve targets, indicators to measure progress towards targets and details of who is responsible for the delivery of outcomes.

Public service agreements exist between various departments and levels of government. The central Department for Transport operates under a public service agreement with the Treasury to specify the Department's performance goals for a three-year budget cycle. The Department of Transport then develops local public service agreements in which a local authority commits itself to achieving a range of targets that reflect both national and local priorities. Ten major urban areas have signed local agreements to improve their transportation systems thus far.

The local authority chooses from a suite of national performance measures based on which ones are most relevant to the locality, and then sets targets for the chosen measures. The local governments are also encouraged to develop additional or supplementary local targets. The public service intended to ensure success in meeting national goals while leaving the bulk of the decision-making and implementation to local authorities. Local authorities can tailor national goals to their own specific set of needs and circumstances and are motivated to go "above and beyond" through the granting of financial awards and added flexibility.

Lessons Learned: A successful performance-based system balances national objectives with local flexibility. Financial awards and increased freedom for successful local programs motivate authorities to think creatively and reach their local targets.

Case Study: Lynchburg Passenger Rail

An innovative funding solution and public-private partnership between the Virginia Department of Transportation, Norfolk Southern Railway and Amtrak has resulted in a new passenger rail service in the Commonwealth of Virginia. This service improves mobility for residents along a 170 mile corridor, connecting cities and small towns with Washington D.C., Philadelphia, New York and Boston. The rail improvements to allow this new service costs around \$40 million with the Commonwealth paying approximately \$30 million and Norfolk-Southern covering the rest of the cost.

34 <http://leg1.state.va.us/cgi-bin/legp504.exe?091+sum+HB1580> and <http://leg1.state.va.us/cgi-bin/legp504.exe?091+ful+CHAP0871>

Since the beginning of service in October 2009, the new Amtrak Virginia train on the Lynchburg route has exceeded its annual performance targets. The latest ridership data for March 2010 indicates that the Lynchburg train now exceeds the annual ridership goal of 51,000, with 55,025 passengers during the first six months of operation.³⁵

The line has provided central Virginia with essential economic linkages to multiple cities for less than the cost of building a road. Former Virginia Delegate Shannon Valentine said, “Many people don’t realize what the cost of roads is, and that we are never going to build enough highways to solve all of our transportation and economic needs... A one-mile stretch of road costs \$20 million to design and build. For about the same price, the state will get trains running from Lynchburg and Richmond to Washington, D.C., every day for three years.”³⁶

Lessons Learned: Many types of projects can improve mobility along critical corridors, but too many states are unable to consider rail and other improvements because the federal transportation program restricts the use of funds to certain types of projects. Our federal transportation program should provide flexible funding that focuses on outcomes rather than predetermined means.

Case Study: Highway Performance Monitoring System³⁷

The Highway Performance Monitoring System (HPMS) is a data collection system used by the Federal Highway Administration. The national transportation database and analytical simulation system is used to develop biannual Condition and Performance Reports that are used by Congress to inform decisions.

The HPMS has replaced a number of uncoordinated annual state data reports and other special studies. Information compiled on the database includes data on highway conditions, performance and usage for rural, small urban and urbanized areas. The report is meant to measure and monitor the conditions and operating characteristics of U.S. highways to inform the evaluation of Federal highway programs and funding levels.

Lessons Learned: A performance-based system requires more than just data to be successful. The data should inform resource allocations to improve performance. Data collection also must be well funded and be updated at appropriate intervals.

Case Study: Metropolitan Transportation Commission³⁸

The Metropolitan Transportation Commission (MTC), the transportation planning and financing agency for the nine-county San Francisco Bay Area,

35 Virginia Department of Rail and Public Transportation. “New Lynchburg Train Exceeds Performance Goals.” May 19, 2010.

36 Ray Reed. “Kaine on board with Lynchburg rail agreement.” April 1, 2009. Available: http://www2.newsadvance.com/lna/news/local/article/kaine_on_board_with_lynchburg_rail_agreement/14852/

37 Federal Highway Administration. Highway Performance Monitoring System. Available: <http://www.fhwa.dot.gov/policy/ohpi/hpms/index.cfm>

38 Metropolitan Transportation Commission. “Performance Assessment Report- Transportation 2035 Plan for the San Francisco Bay Area.” December 2008

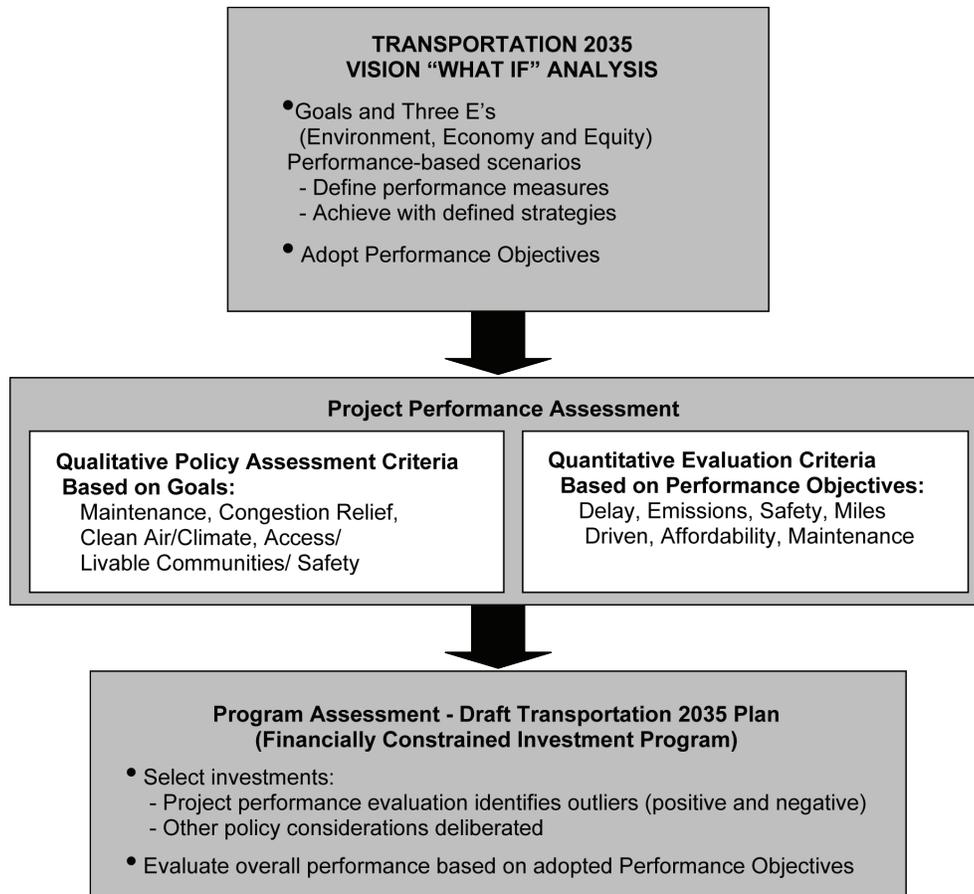
utilizes an objectives-driven, performance-based approach to transportation. The system informs decision-makers and the public on the trade-offs of various investments scenarios. The performance-based approach is a three-step analysis process relying on travel-demand models and other analytical tools to evaluate the impact of scenarios on established goals.

The vision for MTC's 2035 plan was framed by three overarching principles – Economy, Environment and Equity. MTC developed six sets of ambitious performance objectives for each principle.

MTC's first step was to conduct analysis of “what if” scenarios to understand whether the objectives were achievable and what types of investment and

policies would be needed. This analysis was done using the regional travel demand model. MTC tested three potential investment scenarios: (1) a program of freeway operations strategies; (2) a regional High Occupancy Toll (HOT) lane network with bus enhancements; and (3) extensive rail and ferry expansion. MTC choose very different infrastructure packages to better understand differences in performance.

For the second phase of analysis, Project Performance Assessment, MTC conducted a project-level cost-effectiveness assessment of potential investments to understand how each worked toward accomplishing performance objectives. The assessment was both qualitative and quantitative. The quantitative approach used a



cost-benefit analysis to measure cost - effectiveness with respect to the performance objectives. The qualitative assessment determined the extent to which each project supported the goals identified in the 2035 Regional Transportation Plan. This process concluded by selecting the projects to be included in the draft Regional Transportation Plan.

The last phase of the analysis involved measuring how the chosen projects in the financially constrained plan contributed to accomplishing the performance objectives. MTC concluded that its plan was headed in the right direction, but that it would take considerably more than infrastructure investment to reach their ambitious performance objectives.

Lessons Learned: A performance-based plan can be used to analyze the impacts of various investment scenarios on long-term goals and the tools to begin our transition to a performance-based planning system already exist. As we transition, modeling can be used in place of “real time” data.

As time and resources are put into developing a consistent data collection system, we can shift to the use of “real time” data.

Appendix C.

Analyzing Progress

A transition to a performance-based transportation system will require states and regions to gradually collect information related to the condition, scope and performance of their transportation networks – or indicators. States and regions will be given the flexibility to determine which indicators to collect. Indicators should be tracked on an annual basis to help state and local decision-makers and citizens understand how direct and indirect factors influence the progress towards locally adopted objectives. The progress of the indicators could be related to decision-makers and citizens through published state and regional reports. The report could also include a comparison of current indicators and previous indicators in order to further understand how policy choices and investments are affecting the performance and condition of the transportation network.

As we transition into a performance-based planning system, a better understanding of how specific factors influence the performance of the transportation network will help the shift from utilizing models to relying on ‘real time’ progress determined by actual indicators. Most states and regions are already collecting some of this information, but time and resources are required to make the data collection consistent and process reliable.

Transportation for America believes the federal transportation program should be restructured and consolidated, heading away from single-mode

“silos” towards greater integration. We believe a core set of programs should be established for: System Preservation and Renewal, Transportation Safety, Energy Security for Clean Communities, State and Regional Accessibility, and Performance-based Planning. During this initial stage of the transition each state and region would be provided the flexibility to determine the specific indicators that are tracked for the core programs. Below is a list of example indicators:

System Preservation and Renewal Program.

Highway preservation and renewal funding.

These indicators could help provide context on the total amount of state and local transportation funding spent on highway preservation and renewal of facilities eligible under this program.

- Percent of total state and local transportation funds used for preservation and renewal purposes on federal-aid highways
- Total amount of state and local transportation funds used for preservation and renewal purposes on federal-aid highways
- Percent of total state and local transportation funds used for preservation and renewal purposes on bridges
- Total amount of state and local transportation

funds used for preservation and renewal purposes on bridges

- Percent of available TSPR highway funds obligated

Transit preservation and renewal funding. These indicators could help provide context on the total amount of state and local transportation funding spent on preservation and renewal of transit systems and facilities eligible under this program.

- Percent of total state and local transportation funds used for preservation and renewal of public transportation systems
- Total amount of state and local transportation funds used for preservation and renewal of public transportation systems
- Percent of total state and local transportation funds used for preservation and renewal of public transportation systems
- Total amount of state and local transportation funds used for preservation and renewal of public transportation systems
- Percent of available TSPR transit funds obligated

Condition and use of highways and bridges. These indicators could help provide information on the overall condition of highways and bridges in various parts of the state or region and the number of users impacted by poor conditions.

- Percent of rural federal-aid highways not in a state of good repair

- Percent of urban federal-aid highways not in a state of good repair

- Percent of rural bridges rated “structurally deficit”

- Percent of urban bridges rated “structurally deficit”

- Percent of Average Annual Daily Traffic (AADT) traveling on highways with poor condition

- Percent of AADT traveling on structurally deficit bridges

Condition public transportation systems. These indicators could help provide information on the overall condition of public transportation systems in the state or region.

- Percent of rural transit vehicles in service past their useful life
- Percent of urban transit vehicles in service past their useful life
- Percent of rural transit facilities in a state of good repair
- Percent of urban facilities in a state of good repair
- Percent of fixed guideway systems in a state of good repair

Administrative. These indicators could help provide context on the accuracy of the other indicators.

- Percent of federal-aid lane miles surveyed for condition
- Percent of bridges inspected for rating

Transportation Safety Program.

Scope of the problem. These indicators could help provide information on the scale, location and impacts of transportation safety issues.

- Total number of transportation-related fatalities per million vehicle miles traveled
 - In urban areas
 - In rural areas
 - Involving automobiles
 - Involving pedestrians
 - Involving bicyclists
 - Involving heavy-trucks
- Total number of transportation related crashes per million vehicle miles traveled
 - In urban areas
 - In rural areas
 - Involving automobiles
 - Involving pedestrians
 - Involving bicyclists
 - Involving heavy-trucks

Scope of Safety Projects. These indicators could help provide information on the impact of funded projects on the scope of the safety problem for all users of the transportation network.

- Number of safety improvement projects completed
- Number of identified high risk rural road segments that were improved
- Number of highway segments with high truck crash rates that were improved
- Number of highway segments with high pedestrian crash rates that were improved
- Number of highway segments with high bicyclist crash rates that were improved
- Number of transportation related crashes that occurred at safety improvement project locations
- Total AADT impacted by safety improvement projects completed

Safety funding. These indicators could help provide context on the total amount transportation funding spent on safety activities of facilities eligible under this program.

- Percent of total state and local transportation funds used for safety improvements
- Total amount of state and local transportation funds used for safety improvements
- Percent of available Transportation Safety Improvement Program funds obligated

Design factors. These indicators would help provide information on the operational and design improvements implemented to help address safety issues.

- Percent of lane miles with striping that meet Federal Highway Administration (FHWA) reflectivity standards
- Percent of signs that meet FHWA reflectivity standards
- Number of local governments that have adopted context-sensitive design standards
- Number of traffic control and other warning devices installed at locations identified as an area with a high crash potential
- Number rail grade crossings separated

Energy Security for Clean Communities Program.

Efficiency and effectiveness of investments. These indicators could help provide information on the overall and project type cost effectiveness at improving air quality and reducing oil use.

- Reduction in PM, VOC, and NOX in non-attainment and maintenance areas due to projects completed using funding
- Cost per ton of reduced PM, VOC and NOX
- Cost per ton of reduced carbon emissions
- Average reduction in PM, VOC and NOX per \$X investment in I, II, III, IV and V project types

- Average reduction in oil use per \$X investment in I, II, III, IV and V project types

Facility, demand management and vehicle impacts. These indicators could help provide information on vehicle and engine age and type, and demand management activities influence air pollution and oil use.

- Average age of truck engines operating at port or intermodal facility
- Percent of rail yard locomotives that are hybrid
- Average number of persons moved per HOV lane per facility during the AM and PM peak hours
- Average number of persons moved per arterial lane mile in non-attainment and maintenance areas during the AM and PM peak hours
- Ratio of electrified truck parking spaces to total truck parking spaces
- Ratio of alternative fueling stations and stations that provide alternative fuel compared total fueling stations

Statewide Accessibility Program.

Transportation options. These indicators could help provide information on how well state investments preserve capacity and reduce congestion on federal-aid highways.

- Average cost per federal-aid lane mile to improve traffic flow

- Modal split of long distance trips
- Average per capita local trips on interstate highways
- Average per capita local trips on federal-aid highways
- Number of towns with a population greater than 5,000 connected to major urban centers by multiple transportation options
- Number of jurisdictions that have adopted local traffic management policies (i.e. local street connectivity, access management and other policies)

Transportation and land use coordination. These indicators could help provide information on how well state transportation investment decisions are coordinated with local land use decisions.

- Number of federal-aid lane miles outside of urbanized areas covered by access management plan
- Percent of new households located within an urban cluster or urbanized area as defined by the Census
- Percent of new jobs located within an urban cluster or urbanized area as defined by the Census
- Percent of jobs located within an urbanized area as defined by the Census located within ¼ mile of fixed route transit service, fixed guideway transit service and direct HOV/HOT lane access points

- Percent of households located within an urbanized area as defined by the Census located within a ¼ mile of fixed route transit service and direct HOV/HOT lane access points and ½ mile of fixed guideway transit service
- Density of development within ¼ mile of fixed route transit service and direct HOV/HOT lane access points and ½ mile of fixed guideway transit service

Equity. These indicators could help provide information on how well the transportation system meets the needs of low-income individuals, persons with disabilities and older individuals.

- Number of low income households located within the service area of a JARC transit operator or within ¼ mile of fixed route transit service and ½ mile of fixed guideway transit service
- Percent of low income households located within the service area of a JARC transit operator or within ¼ mile of fixed route transit service and ½ mile of fixed guideway transit service
- Number of senior households located within the service area of a 5310 transit operator
- Percent of senior households located within the service area of a 5310 transit operator
- Number of persons with disabilities located within the service area of a 5310 transit operator
- Percent of persons with disabilities located within the service area of a 5310 transit operator

Goods movement. These indicators could help provide information on the degree to which the transportation system helps facilitate the efficient movement of goods while minimizing the impacts on adjacent communities.

- Ton miles of freight moved by truck
- Ton miles of freight moved by rail
- Mode split by TEUs
- Miles of short-line rail improved
- Number of truck engine retro-fits
- Average age of truck engines operating at port or intermodal facility
- Percent of rail yard locomotives that are hybrid
- Ratio of electrified truck parking spaces to total truck parking spaces
- Average carbon emissions per TEU at port and/or intermodal facilities
- Number of curbside management plans implemented in urban areas
- Number of rail grade crossings separated

Regional Accessibility Program.

Transportation options. These indicators could help provide information on how well regional investments preserve capacity of the federal-aid highway system for long distance travel by providing options for local traffic.

- Average cost per federal-aid lane mile to improve traffic flow
- Average per capita local trips on interstate highways
- Average per capita local trips on federal-aid highways
- Modal split of local trips
- Modal split of inter-regional trips
- Number of jurisdictions that have adopted a “local traffic management policy” (i.e. local street connectivity policy)

Transportation and land use coordination. These indicators could help provide information on how well regional transportation investment decisions are coordinated with local land use decisions.

- Job to housing ratio of areas within metropolitan planning area compared to overall job to housing ratio of the metropolitan planning area
- Percentage of development of X land use density served by transit with a quality of service of B in peak hour (based on the Transit Capacity and Quality of Service Manual)
- Percentage of jobs within ¼ mile of fixed route transit service, ¼ mile of direct HOV/HOT lane access points, or ½ mile of fixed guideway transit service
- Percentage of households within ¼ mile of fixed route transit service, ¼ mile of direct HOV/HOT lane access points, or ½ mile of fixed guideway transit service

- Density of development around existing fixed guideway transit stops
- Compatibility of local land use decisions with adopted scenario in performance based long-range plan

Equity. These indicators could help provide information on how well the transportation system meets the needs of low-income individuals, persons with disabilities and senior individuals.

- Number of low income households located within the service area of a JARC transit operator or within ¼ mile of fixed route transit service, and ½ mile of fixed guideway transit service
- Percent of low income households located within the service area of a JARC transit operator or within ¼ mile of fixed route transit service, and ½ mile of fixed guideway transit service
- Number of senior households located within the service area of a 5310 transit operator
- Percent of senior households located within the service area of a 5310 transit operator
- Number of persons with disabilities located within the service area of a 5310 transit operator
- Percent of persons with disabilities located within the service area of a 5310 transit operator

Appendix D.

Existing Reporting Process

States currently report information to U.S. DOT pertaining to funding, operational, and conditional performance of their bridges, highways and transit systems. Below is a description of the type of data that is collected and the public datasets where this information can be found.

Highway Performance Monitoring System (HMPS)

The HPMS is a national highway information system that includes data on the extent, condition, performance, use, and operating characteristics of the nation's highways. Universe data must be reported on a section-by-section basis for all rural arterials, urban principal arterials, and National Highway System (NHS).

National Bridge Inventory

The National Bridge Inventory is a database with information on all bridges and tunnels in the United States that have roads passing above or below. This bridge information includes the design of the bridge and the dimensions of the usable portion. The data is often used to analyze bridges and judge their conditions. The bridge inventory is developed with the purpose of having a unified database for bridges, including identification information, bridge types and specifications, operational conditions, bridge data including geometric data and functional description, inspection data and other elements.

National Transit Database

The National Transit Database annually collects uniform data from all recipients of Urbanized Area Formula funding and any organization operating urban transit services that directly receive benefit from Urbanized Area Formula funding. A large amount of information is collected, including: funding allocation, person counts, miles traveled, vehicle inventory, maintenance performance and energy consumption.

Highway Safety Information System

The Highway Safety Information System (HSIS) is a multi-state database that contains crash, roadway inventory, and traffic volume data for a select group of states. The participating states were selected based on the quality of data available and their ability to merge data from the various files. The HSIS is used to analyze a large number of safety problems, ranging from the more basic "problem identification" issues to modeling efforts that attempt to predict future accidents from roadway characteristics and traffic factors. The HSIS is used in support of the FHWA safety research program and as input to program and policy decisions

Financial Management Information System

The U.S. DOT's Financial Management Information System is an integrated database system with purchasing and accounting components. Because of the unique needs of the U.S. DOT, particularly

with respect to Federal grants and projects, it maintains its own version of Federal Management Information System (FMIS).

The data is reported publically in the annual Highway Statistics Series and in the bi-annual Conditions and Performance report. The Highway Statistics Series consists of annual reports containing information on motor fuel; motor vehicles; driver licensing; highway-user taxation; state and local government highway finance; highway mileage, and Federal aid for highways. The bi-annual condition and performance reports on the condition, performance, and future capital investment of highways, bridges and transit systems.