Maryland Department of Transportation

Annual Attainment Report on Transportation System Performance

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Introduction

This inaugural *Annual Attainment Report on Transportation System Performance* is a companion piece to the State Report on Transportation which is composed of the Maryland Transportation Plan (MTP) and Consolidated Transportation Program (CTP). The purpose of the Attainment Report is to present, describe and discuss a new set of performance indicators that the Maryland Department of Transportation (MDOT) intends to use over time to ascertain the Department's progress towards meeting the goals and objectives defined in the MTP and implemented through the MTP and projects, programs and services funded through the CTP. This inaugural Report provides the foundation for future Attainment Reports and provides a baseline by which future performance will be compared.

The performance indicators presented in the report are intended to help MDOT management – and MDOT stakeholders – better understand and assess the relationship of investments in programs and projects with the services and quality those investments produce. Ideally, the performance measure and performance would be clear and direct. Often, this relationship can only be inferred through indirect relationships, and correspondingly, indirect measures of performance. Similarly, the available data tools used may not provide the exact information sought. Trial and error will be required to identify a set of indicators and measurement tools that can most accurately gauge performance. This inaugural Attainment Report presents the best performance indicators and performance measurement data available at this time. Future reports will take this year's document as a starting point, and it is reasonable to expect annual modifications to the Attainment Report as MDOT strives to find the "right" set of measures.

The Attainment Report is organized by MTP goal. The goal statement and its associated objectives are stated as a policy backdrop for the indicators, but the meat of this report is reserved for presentation of performance indicators associated with each MTP goal, and the best performance measurement and trend data available. MDOT intends to identify and track measures that give the most accurate and comprehensive assessment of the performance of the transportation system in meeting the MTP goals and objectives. Because modal administrations use different performance measurement and tracking systems, these data aren't completely consistent this first year across modes for each measure. In some instances, a logical comparison cannot be made of the same measure across modal administration. "Current" data will vary by year, with some measures coming in as 2000 data, others coming in as 2001, and some data only coming in on a cycle of every few years. Thus, examination of data will occur separately for each modal administration. In future Attainment Reports, MDOT will seek to eliminate these time frame and reporting inconsistencies. Additionally, MDOT will seek to improve the accuracy of its performance indicators by considering the potential of new measures to meet its attainment reporting needs. This document previews a number of those measures that we will consider for future use. Finally, there are measures relevant to Statewide goals and objectives that MDOT proposes to assist other state agencies in tracking, as the focus of the measure falls more closely within the missions and would be better reported through other documents.

The Attainment Report concludes with a section that discusses three key performance issues that demonstrate the complex relationship between the transportation investments in the current Consolidated Transportation Program and the MTP goals and objectives.

Goal 1 Lead the development of transportation investments and facilities that support Smart Growth

Policy Objectives

- Direct transportation funding to Priority Funding Areas.
- Design and coordinate transportation projects, facilities, programs and services to reinforce local land use plans and economic development initiatives that support Smart Growth principles.
- Work with local communities to increase their understanding of Smart Growth principles and opportunities and incorporate Smart Growth into local plans and visions.

Targeted Indicators

- Capital expenditures in targeted areas
- Program participation

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Capital expenditures in targeted areas/ Program participation

MDOT has developed a number of programs designed to support community revitalization and development activities under the Smart Growth Initiative. MDOT's Neighborhood Conservation program and MTA's Smart Growth Transit Program are cornerstones of Maryland's Smart Growth initiative. The Neighborhood Conservation Program (NCP) helps rebuild communities across Maryland, from older urban areas to small rural towns, by paying for transportation and related infrastructure improvements in neighborhoods designated for revitalization. The MTA Smart Growth Transit Program consists of several infrastructure development programs that are designed to encourage community revitalization activities around transit stations. The program has multiple objectives including encouraging revitalization, increasing ridership, and improving transit facilities and access. The programs include the Transit Station Development Incentive Program, the Neighborhood Conservation Program, Access 2000 (for bicycle/pedestrian improvements), and Shelter Enhancement Program. Tracking the number of projects and spending levels on these programs provides an indirect measure of the impact Smart Growth implementation is having around the State.

PERFORMANCE BASE

Capital expenditures in targeted areas

Neighborhood Conservation Program [3]	Number of projects programmed	Fiscal Year 2001: 37 projects programmed
Smart Growth Transit Program	Dollars Spent	Fiscal Year 2001: $2,747,011

Program Participation

Neighborhood Conservation Program[3]	Number of communities with Neighborhood Conservation Projects	Cumulative total 1997-2001: 96 jurisdictions

[3] The program is administered jointly by SHA and MTA.

TRENDS and TARGETS

Capital expenditures in targeted areas/ Program participation

- In FY 2001, 37 Neighborhood Conservation (NCP) projects were programmed for construction. It is anticipated that 42 projects will be programmed for construction in FY 2002.
- Current forecasts for planned NCP investments estimate that approximately 40 projects will be programmed in FY 2003. Each year a number of concept projects are begun with the goal of advancement to design and construction.
- Since 1997, the State has invested over $75 million in NCP. Thirty projects are now complete, and 125 are in concepts, design, or construction. Projects are located in 96 jurisdictions.
- MDOT, including SHA and MTA, will continue to provide technical assistance to local communities to develop NCP projects. Planned investments indicate that the rate of new projects implemented will continue at the current rate.
- MTA anticipates having $6 million in FY 2003 for the Smart Growth Transportation Program. It is anticipated that this trend will continue or increase in future years.
- Recently the deadline passed for proposals requesting FY 2003 funding consideration. MTA received 48 proposals totaling $6 million for FY 2003 funding consideration. This is the highest number of proposals received in the program's seven-year existence.
  The typical number of proposals is between 25-30 proposals. Although all proposals cannot be funded with current resources, this increased interest is a positive trend which hopefully will continue along with additional resources for the Smart Growth Transit Program.

Measures for future consideration/development:

- Percent of major capital spending in Central Business Districts (CBDs), downtown cores, empowerment zones, and revitalization areas
- Improved "quality of life" or livability as determined by perceptions of street safety, walkability, and quality of retail, services, and jobs available at the community level (To be tracked in conjunction with Goal 10, Customer Service)
- Transit Oriented Development – tools and indicators to be determined
- Quality and completeness of bicycle and pedestrian networks – (identified in the State Bicycle and Pedestrian Master Plan currently under development)
- Technical assistance to local governments

Measures for consideration and tracking through State agency partners:

- Measures of rekindled economic activity in existing "urban" communities, particularly distressed areas. Examples of factors tracked may include new businesses, job growth, housing quality and cost, and tax revenues.
- Rate of land consumption versus population growth
- Jobs/housing balance in PFAs, counties, and other defined geographical areas
- Compatibility of transportation expenditures to other State capital investments

Policy Objective

- Preserve and maintain existing transportation infrastructure and services as needed to realize their useful life.

Targeted Indicator

- Condition of State-maintained facilities and infrastructure

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Condition of State-maintained facilities and infrastructure

Each modal administration uses its own measures to evaluate the condition of the various facilities it operates. The major facilities for which condition is measured are road pavement, bridges, and transit vehicles.

Transit vehicle age is the measure selected to gauge the condition of the transit system. Although more than vehicle age affects the condition of the vehicle fleet, and a good maintenance program can extend the life of a vehicle, the measure reflects anticipated vehicle quality and maintenance needs. The Federal Transit Administration also uses this measure as an indicator of service condition.

The bridge and pavement measures use Federal and State defined indicators of quality. Pavement condition is measured by ride quality using the International Roughness Index (IRI), a scale for roughness based on the response of a generic motor vehicle to the roughness of a road surface. Although the IRI doesn't directly indicate what is happening to a pavement structurally (internal condition), on a network level, there is fairly good correlation between ride and structural condition. As pavements shove, crack, etc., ride will deteriorate. The Federal Highway Administration requires that ride, and specifically the IRI, be calculated and monitored.

Bridge conditions are evaluated according to a federal standard for structural deficiency (meaning the strength and condition did not meet desirable standards) and functional obsolescence (meaning the lane width and/or shoulders on the bridge are narrow, there is inadequate clearance or a factor which would not meet the current guidelines for the roadway). This measure provides information on the need for rehabilitation, reconstruction, or replacement of bridges.

PERFORMANCE BASE

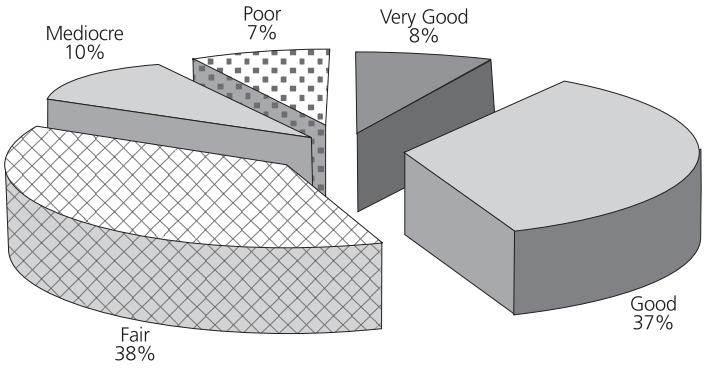
Condition of State-maintained facilities and infrastructure

Mode	Performance Measure	Data
Maryland Transit Administration	Average age of MTA and WMATA buses	FY 2001: MTA buses: 8.1 years WMATA buses: 7.93 years
State Highway Administration	Percent of SHA maintained roads rated fair to very good	Year 2000: 82% of roads had acceptable ride quality (See below for detail)
Maryland Transportation Authority	Percent of bridges and overpasses categorized as structural deficiency by federal standards	Year 2000: 0 Structurally Deficient Bridges

Condition of State Highway Bridges

	All State Highway Bridges		State Bridges On National Highway System		State Bridges Off National Highway System	
Bridge Condition	Number	Percentage	Number	Percentage	Number	Percentage
Structurally Deficient	151	6%	59	4%	92	8%
Functionally Obsolete	464	19%	243	17%	221	20%
Meets Current Standards	1868	75%	1,053	77%	814	72%

2000 SHA Roads Pavement Condition Distribution



TRENDS and TARGETS

Condition of State-maintained facilities and infrastructure

- By FY2006, the MTA would like to have a vehicle fleet with an average age of 6.5 years. For both MTA and Washington Metropolitan Area Transit Authority (WMATA), the current approved CTP includes a ramped-up bus replacement program that will bring the average age of the fleet to the Federal Transit Administration minimum of 6.5 within a five year time period.
- MdTA's target for bridges is to remain without structural deficiencies in the future.
- Maryland has a very healthy State road network. The percentage of acceptable roadways has steadily increased from a value of 80% in 1996.
- The improvement in acceptable ride quality for Interstate and higher volume roadways is more dramatic, where conditions are improving almost 2½ times as fast as the rest of the State.
- SHA's target is to increase the percentage of pavement with acceptable ride quality to 86% by 2005, and reduce the number of structurally deficient bridges by 10% from 2001 to 2005.
- Planned investments in bridge replacement and rehabilitation as well as pavement preservation are aimed at continuing recent trends and meeting these targets.

Measures for future consideration/development:

- Condition of bicycle and pedestrian networks
- Condition of other transit facilities, such as stations, fare machines, escalators/ elevators, and rail infrastructure
- Condition of Port of Baltimore facilities
- Condition of airport facilities

Goal 3

Optimize the value of the State's transportation system by seeking the highest possible performance from existing and future transportation facilities and services

Policy Objective

- Maximize the carrying capacity and operating performance of existing transportation facilities and services.

Targeted Indicator

- System Performance

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

System Performance

System performance is fundamental to the State's transportation facilities and services. Reductions in performance limit the transportation network's efficiency, create negative impacts for users of the system, and affect every mode. Highway congestion, transit system performance, congestion at toll plazas, average MVA branch office customer visit time, and BWI terminal capacity are key areas for indicating system performance.

The public identifies congestion relief as a key performance concern for the State highway system. There are a number of measures that indicate the level of congestion on the highway system. A widely used measure is Level-of-Service (LOS), a grading system much like those used for school report cards ("A" as ideal, "B" as very good, "C" as average, "D" as very bad and "F" as gridlock). LOS takes into consideration travel speeds and the volume of traffic vs. the capacity of the roads. Every three years SHA measures the LOS on the State's primary road system in the Baltimore/Washington Region. Another commonly used measure by SHA is the volume service flow (VSF), a comparison of traffic volumes to available capacity. Every year SHA samples various State roads to better understand congestion on the system.

Transit route success is a key indicator of system performance for the MTA. For an effective transit system, efforts must be made to have successful route structure. The MTA analyzes route performance and develops a rating for each route. Included in the analysis are the following measures: 1) average daily boardings; 2) boardings per mile; 3) boardings per trip; 4) subsidy per boarding; and 5) farebox recovery. Based on a comparison of individual routes to the average for all core bus routes, the MTA rates the routes as "successful," "acceptable," or "unacceptable." MTA uses the percent of routes with "successful" and "acceptable" performance as an indication of the overall performance of the system. The MTA targets operations and capital improvements to individual routes and modes based on the results.

By their nature, toll plazas reduce the speed of vehicles traveling on Maryland's highways and bridges. Congestion at toll plazas can reduce the number of cars and trucks able to pass through Maryland's tunnels and bridges each hour. Maryland's MTAG program (soon

to become E-ZPass) was established in part to address these bottlenecks and increase "throughput" at these important facilities, particularly during "peak" (rush) hours. MdTA is tracking vehicle throughput at the Baltimore Harbor tunnel and Fort McHenry tunnel as a measure of the system performance.

The MVA is a customer-service agency whose success is often determined by how efficiently it is able to serve customers. To measure how efficiently customers are served, MVA tracks average customer visit time with a quarterly customer survey.

The BWI Airport is one of the fastest growing passenger airports in the country. To continue accommodating this growth and remain the "Easy Come, Easy Go" airport, MAA strives to remain at or below 100% of terminal gate capacity, which is 250,000 passengers per gate per year – the industry standard.

PERFORMANCE BASE

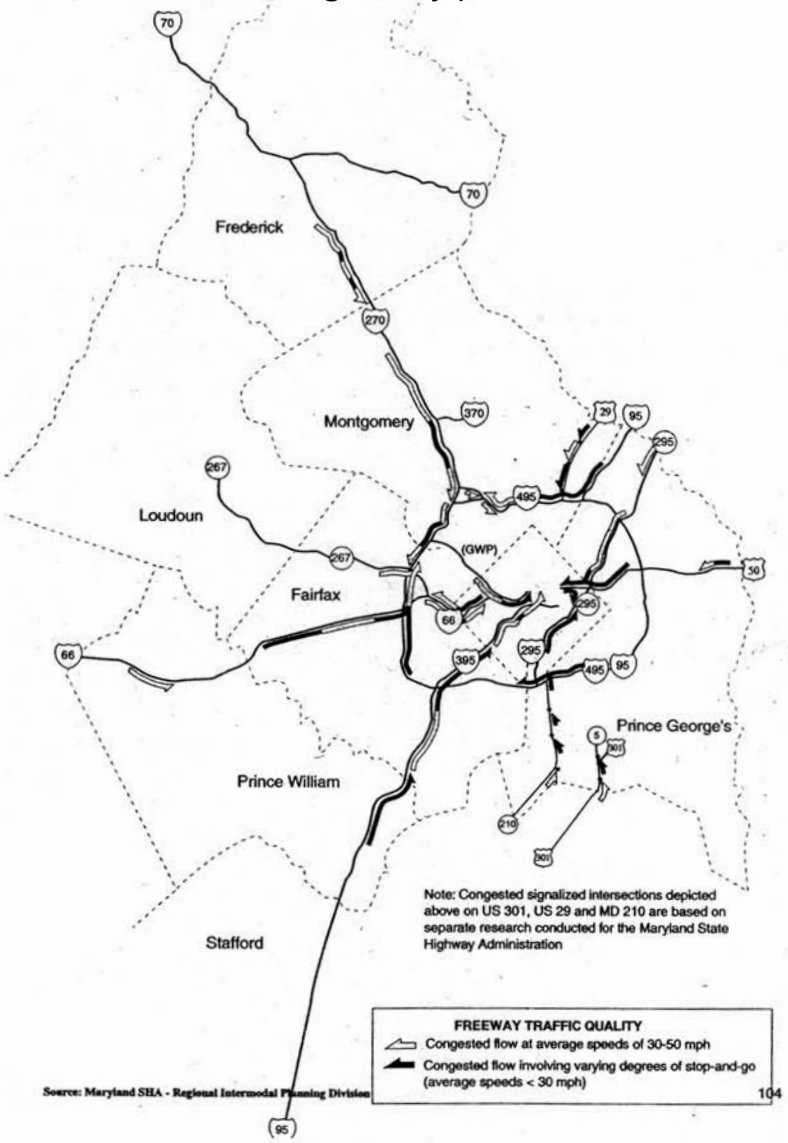
System Performance

Mode	Performance Measure	Data
State Highway Administration	Percentage of the State Highway system that is congested[2] using VSF	Year 2000: Approximately 14% of the State system is considered congested
	Congestion using Level of Service on Freeways and Arterials in Baltimore and Washington Region	See accompanying figures
Maryland Transit Administration	Percentage of routes with "Successful" or "Acceptable" performance	Year 2000: 17.1% of routes were successful 62.8% of the routes were acceptable
Motor Vehicle Administration	Average Customer Visit Time	Fiscal Year 2001: 34 minutes
Maryland Aviation Administration	BWI Terminal Gate Capacity	Fiscal Year 2000: 94%
Maryland Transportation Authority	Average Annual Peak Hour Throughput at the Fort McHenry and Baltimore Harbor tunnels	Year 2000: 13,443 vehicles per hour

[2] Congested is defined as any highway section with a volume service flow(VSF) ratio of greater than .90. VSF measures the volume of traffic at peak hour relative to the capacity of the road segment. Data is based on Highway Performance Monitoring System (HPMS) **samples** for calendar year 2000, which cover approximately **11%** of the State highway and toll systems.

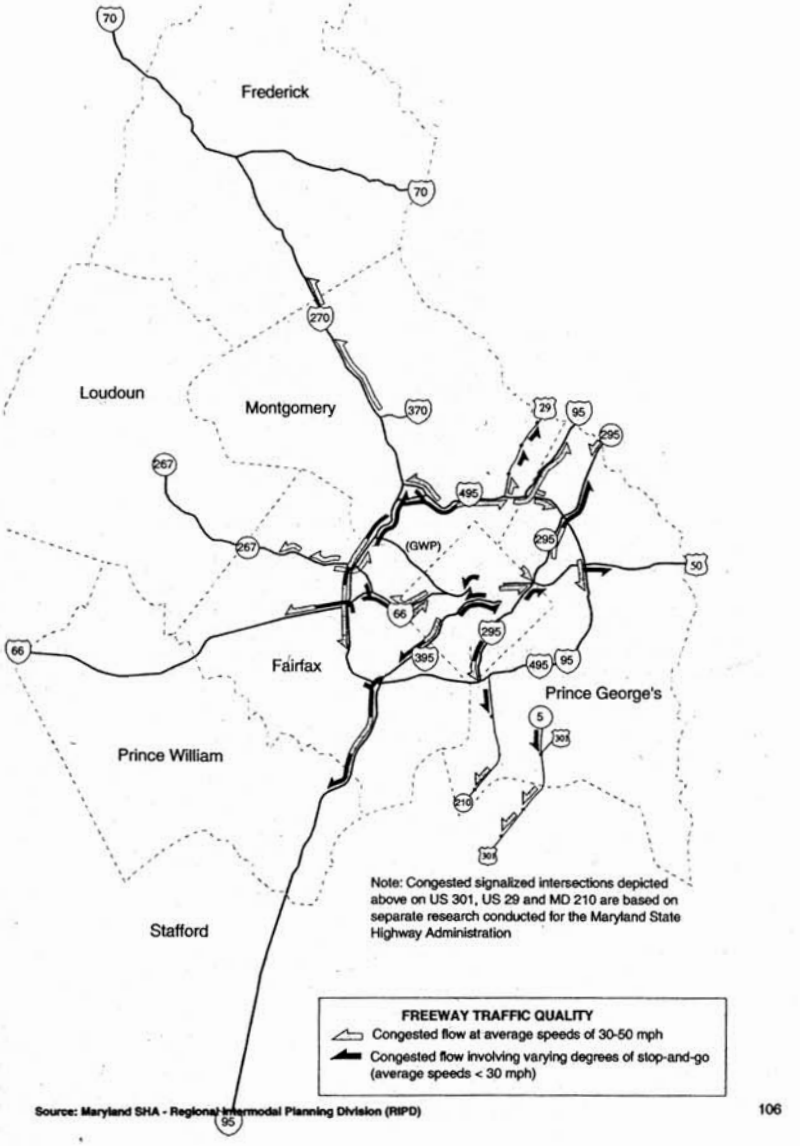
MORNING

This map shows congested locations observed during the morning survey period



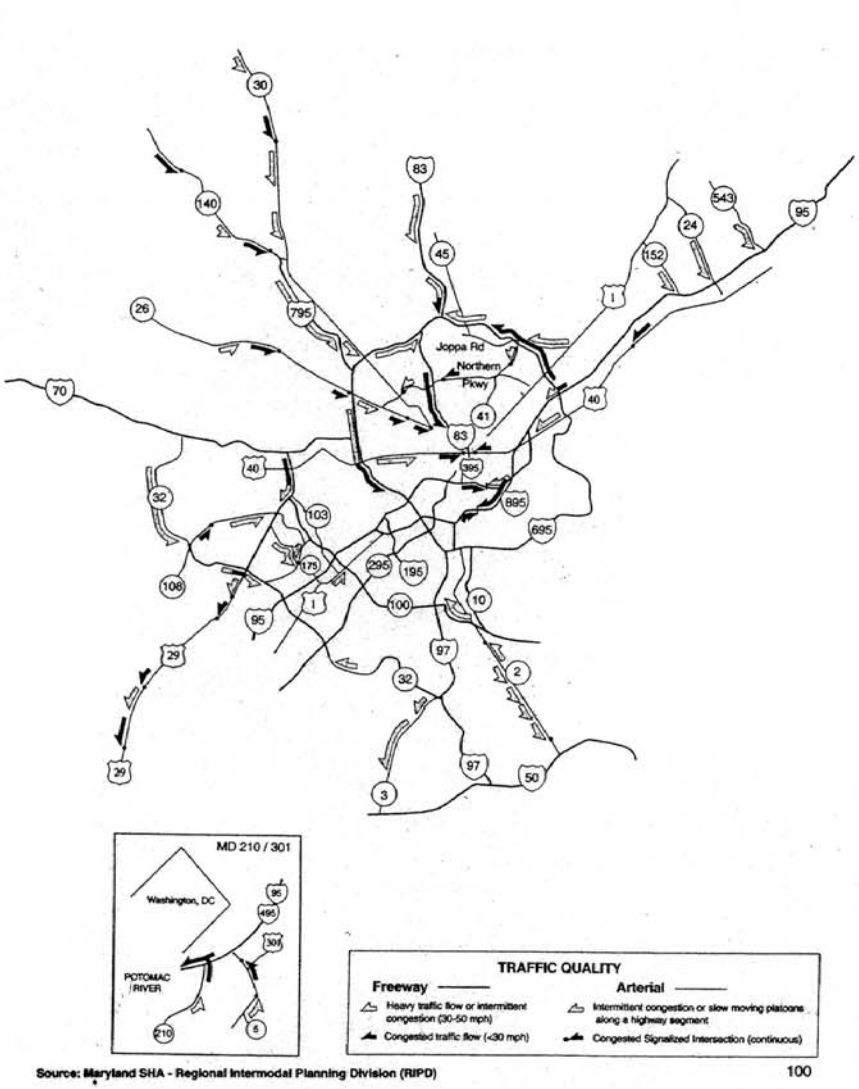
EVENING (Spring 1999)

This map shows congested locations observed during the evening survey period



MORNING (Spring 1999)

This map shows congested locations observed during the morning survey period



Source: Maryland SHA - Regional Intermodal Planning Division (RIPD)

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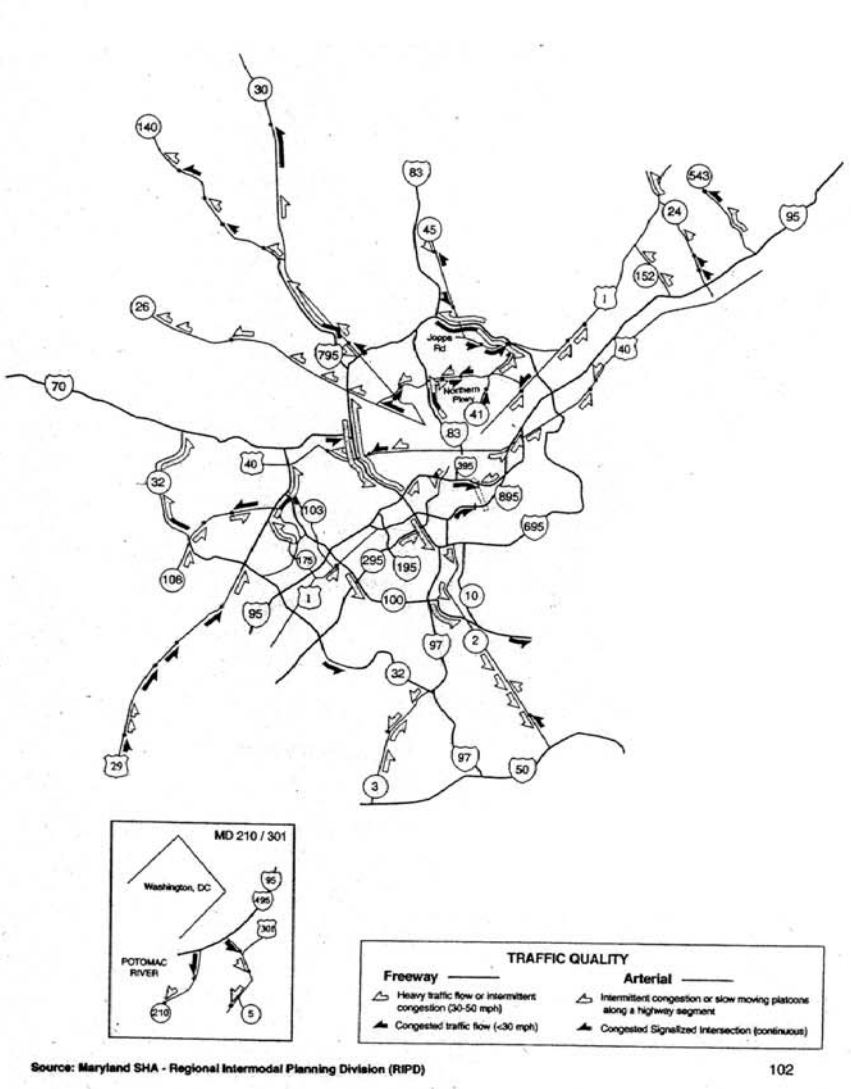
EVENING (Spring 1999)

This map shows congested locations observed during the evening survey period



Source: Maryland SHA - Regional Intermodal Planning Division (RIPD)

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TRENDS and TARGETS

System Performance

- MDOT's long term congestion goal is for the State system to perform better than the Metropolitan Planning Organization's models predict. The intermediate benchmark of progress measures congestion on the State system against MPO model predictions.
- In the long term, it is anticipated that congestion will increase even with implementation of planned investments.
- By calendar year 2002 MdTA is anticipating a 20% increase in throughput at the Baltimore Harbor and Fort McHenry tunnel toll plazas over the 1998 throughput levels.
- Overall, MTA's target for route performance is to achieve 25% successful routes and 75% acceptable routes. Additional investment in transit operation improvement, enabled by the Governor's Transit Initiative, should result in improved route service performance.
- The MTA operating budget includes funding for new routes and for enhancements that extend the span of service, reduce headways, and alleviate overcrowding on existing routes. Improved service can result in increased ridership, but can also result in higher operating costs. Higher operating costs could cause a reduction in the MTA's farebox recovery rate, another aspect of the system's overall performance.
- MVA's transition to and development of new information technology systems and operational improvements as planned through the next 8 fiscal years may result initially in increased customer visit time. However, the planned changes are designed to minimize service delivery impact and visit times will get shorter as customers and employees learn new operational methods. In addition, average customer visit time may be affected by budget cutbacks impacting front-line staffing.
- MAA strives to remain at or below 100% of terminal gate capacity, which is 250,000 passengers per gate per year – the industry standard. MAA forecasts indicate that BWI will exceed the industry standard for capacity in upcoming years. To accommodate the growth, the MAA is undertaking major improvements to the airport, including building additional gates. Industry standards call for planning new gates while the airport is at 65% capacity, and building the gates when 85% of capacity is reached.

Measures for future consideration/development:

- Person throughput on congested corridors
- Percentage of travelers facing congestion on specified trips (origin-destination pairs) with travel options (such as transit and bike facilities)
- Measure of customer satisfaction (in conjunction with Goal 10 Customer Satisfaction)
- Perception of choice
- Measure of unmet demand
- Congestion delay per capita
- Total hours of delay on urban highways
- Gate turn-around times at Seagirt Marine Terminal

Policy Objectives

- Design, build and operate facilities, services and programs that reduce the rate of injury and deaths to our customers.
- Reduce crimes against persons and property using Maryland's transportation facilities, services and operations.

Targeted Indicators

- Fatalities and injuries by persons using each mode of travel (highway, transit, seaport, airport).
- Security of persons and property using the transportation system.

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Fatalities and injuries by persons using each mode

Each modal administration uses different measures of fatalities and injuries because each mode has unique characteristics. The highway portion of the State's transportation system draws the most interest, as the greatest number of transportation related injuries and fatalities occur on these facilities. Generally, injuries and fatalities on highways are calculated as a rate per 100 million vehicle miles traveled (VMT). The State Highway Administration (SHA) set targets for accident rates that reflect the anticipated effects of preventive programs and improvements. Because airport fatalities are rare, the Maryland Aviation Administration (MAA) combines injuries and fatalities into a broader measure that reflects incidents that occur on their property.

Security of persons and property using the transportation system

Data tracking criminal activity on the transportation system are limited. However, MDOT tracks the resources it invests to protect customers of the transportation system, particularly our transit and airport customers. These are indirect measures of MDOT's performance that focus on the level of effort put towards protection. The Maryland Transit Administration (MTA) Police Department tracks the ratio of sworn security personnel to the number of riders on the transit system. The Maryland Port Administration (MPA) tracks the dollar value of thefts and damage that take place from incidents on their facilities. The MAA monitors compliance with FAA security inspections, which are necessary for operation of the Baltimore/Washington International Airport.

PERFORMANCE BASE

Fatalities and injuries by persons using each mode

Mode	Performance Measure	Data
State Highway Administration	Injuries and fatalities on State and Toll Facilities Overall injury and fatalities – number and rate per 100 million vehicle miles Pedestrian injury and fatalities – number and rate per 1 million population Bicyclist injury and fatalities – number and rate per 1 million population	Year 2000: Overall: Fatalities: 445 Fatality Rate: 1.21 Injuries: 31,468 Injury Rate: 85.4 Pedestrian: Fatalities: 69 Fatality: Rate 13.0 Injuries: 578 Injury Rate: 109.1 Bicyclist: Fatalities: 5 Fatality Rate: .94 Injuries: 173 Injury Rate: 32.7
Maryland Transportation Authority	Number of fatal vehicle collisions at Authority facilities Number of vehicle collisions involving injuries at Authority facilities Annual fatal and injury vehicle collision rate (per 100 million vehicle miles) at Authority facilities	Year 2000: Fatalities: 11 Vehicle Collisions involving Injuries: 533 Fatal and injury vehicle collision rate per 100 million VMT: 14.5
Maryland Port Administration	Number of injuries & fatalities per year on MPA property	Year 2000: Injuries: 52 Deaths: 0
Maryland Aviation Administration	Incidents at BWI[1]	Fiscal Year 2001: Incidents: 391

[1] Incidents are defined as documented incidents comprising State vehicle damage, State property damage, personal injury, employee injuries, personal property damage, and any other documented airport events.

Security of persons and property using the transportation system

Mode	Performance Measure	Data
Maryland Transit Administration	Ratio of sworn police officers to riders on the transit system	Fiscal Year 2001: 1.6 sworn police officers per million riders
Maryland Port Administration	Dollar value of thefts and damage at MPA facilities	Year 2000: Thefts: $6,000 Damage: $156,000
Maryland Aviation Administration	BWI Compliance with FAA security inspection	Fiscal Year 2001: Passed

TRENDS and TARGETS

Fatalities and injuries by persons using each mode

- It is estimated that in calendar year 2001 the annual fatal and injury vehicle collision rate on Maryland Transportation Authority (MdTA) facilities will be 14.1 collisions per 100 million vehicle miles traveled.
- During calendar year 2002, MdTA's target is to reduce the annual fatal and injury vehicle collision rate to less than 13.7 collisions per 100 million vehicle miles traveled. This is an annual reduction of at least 3% per year, based on the calendar year 1999 rate.
- The fatality rate for State and Toll Facilities has decreased by 1.8%
- The absolute increase in fatalities in 2000 is somewhat off-set by the increase in VMT. Maryland had reached a 30-year record low number of fatalities in 1999.
- Safety concerns are reflected in all capital improvement and system preservation projects that SHA undertakes, not just specific safety-oriented projects.
- SHA evaluates projects and plans safety enhancements that can be programmed annually into a statewide comprehensive program that ensures project selection and funding needs are consistent with the appropriate Benefit/Cost analysis. Planned investments are targeted accordingly to reduce the fatal and injury accident rates.

Crimes against persons and property using the transportation system

- MTA anticipates maintaining this police/passenger ratio in the coming years.
- The MAA trend for FAA security inspections is projected to be constant. Non-compliance would result in the closure of BWI Airport. Transportation funds are utilized as necessary to continue the trend of continuous airport operation within FAA compliance.

Measures for future consideration/development:

- Customer perceptions of the safety of the system
- Completeness of the bicycle and pedestrian network (as an indicator of the safety of these facilities)
- Injury and fatality rates of graduates from the Motor Vehicle Administration's (MVA) Graduated Licensing System

Goal 5 Provide responsible stewardship of natural, community and cultural resources

Policy Objective

- Minimize impacts and strive to enhance Maryland's resources.

Targeted Indicators

- Air quality
- Chesapeake Bay restoration efforts
- Environmental mitigation

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Air quality

Air quality is a significant environmental factor tracked by MDOT and is an important transportation-related environmental issue affecting urban areas. An indicator of air quality is the Pollution Standard that measures ground level ozone. Ground level ozone is caused when strong sunlight reacts with pollutants from a variety of sources, including emissions from automobiles, lawn mowers, boats, power plants, and industrial facilities.

In the Baltimore/Washington area, automobiles account for 30-40% of the pollutants that cause ground level ozone. Metropolitan areas track the number of days that pollutants reach levels that are dangerous to persons with respiratory health ailments, children, and the elderly. These are commonly known as "Code Red Days" and are highly publicized in an effort to encourage people to avoid activities that contribute to the problem.

Chesapeake Bay restoration efforts

The Chesapeake Bay is one of Maryland's most precious natural resources. Besides restoration required for individual projects, MDOT participates in a multi-agency State program to protect the Chesapeake Bay called "Chesapeake 2000." Under this agreement, MDOT and other State agencies have a series of specific commitments they are responsible for meeting. MDOT has primary responsibility for three commitments under the Sound Land Use goal and is a supporting agency for commitments under the Living Resource Protection & Restoration goal. In addition, most modal administrations contribute toward the achievement of other commitments through mitigation, conservation, restoration, and pollution prevention activities related to their projects and operations.

To quantify MDOT's commitment to reducing environmental impacts, MDOT tracks the dollars spent toward meeting the above commitments. Dollars spent is an indirect measure and cannot fully reflect the number of projects, extent of impact, and the complexity and quality of replacement work done.

Environmental mitigation

Protecting the environment means protecting the streams, rivers, wetlands, forests, and other cultural and environmental resources from the effects of transportation projects and system operations. Although the Department strives to avoid any impacts to the State's resources, these impacts are inescapable with some projects. In addition to providing required mitigation to address impacts caused by specific projects, MDOT invests in programs and projects to enhance environmental resources. Such programs include wildflower plantings along State highways, environmentally friendly dredge deposition, and wetlands creation programs. To gauge the implementation of environmental mitigation and enhancements, MDOT measures that percentage of required mitigation that has been completed.

PERFORMANCE BASE

Air quality

Non-Attainment Areas in Maryland: Number of Code Red Days in 2001	
Baltimore Region	9 Code Red Days
Washington Region	3 Code Red Days
Cecil County	2 Code Red Days

Chesapeake Bay restoration efforts

MDOT funding for programs and projects that contribute to the commitments of Chesapeake 2000 Bay Agreement Fiscal Year 2001	
Living Resources Protection & Restoration	$1,899,000
Vital Habitat Protection & Restoration	$11,047,000
Water Quality Protection & Restoration	$111,000
Sound Land Use	$46,735,000
Stewardship and Community Engagement	$508,000

Environmental mitigation

Mode	Number and percentage of required mitigation completed
State Highway Administration	Year 2001: Wetlands: 633.13 out of 598.52 acres (106%) Reforestation: 13 of 21.59 acres (60%) - to date
Maryland Transit Administration	Year 2001: No Impacts
Maryland Aviation Administration	Year 2001: No Impacts
Maryland Transportation Authority	Year 2001: Reforestation: 4.1 out of 37.3 acres (11%) Wetlands: 45% (Red House Run Stream Restoration) Stream Stabilization: 0%

TRENDS and TARGETS

Air quality

- Overall, there is a trend that air quality has been improving in Maryland. During the 1980s, Maryland averaged 20 days a summer when ground level ozone exceeded the federal health standard (Code Red conditions). Maryland averaged 10 Code Red Days a summer during the 1990s.
- Air quality improvement in Maryland can be attributed to Maryland's adoption of all mandated federal control measures, implementation of numerous local control programs, and help from local communities in limiting pollution-forming activities on forecasted Code Red Days.
- Planned investments incorporate and expand proven strategies, such as telework, regional commuter assistance, and clean vehicle technology to reduce emissions in Maryland's air quality non-attainment areas.
- The ozone problem is complicated by weather conditions that play a major role in the formation of ozone and in the severity of the problem. This can affect future air quality.

Chesapeake Bay restoration

- MDOT's programmed spending for the Chesapeake Bay commitments for which it is a lead or supporting agency is on track for fulfilling the goals of those commitments. Compliance with Maryland's existing and new regulatory programs and Executive Orders will ensure fulfillment of goals for wetlands, reforestation, and stormwater management.
- The modal administrations are on track in the implementation of programs to respond to commitments pertaining to the mitigation and reversal of existing transportation impacts.
- In future years, some modal administrations may need to program additional funding to stormwater management retrofit and stormwater management facilities maintenance.

Environmental mitigation

- MdTA has completed 11% of reforestation promised to the Maryland Department of Natural Resources (4.1 acres out of 37.3 acres). In 2002, that percentage will increase to 52% when they complete the MD 272 interchange and the I-95 noise wall projects. The remaining reforestation will be completed with the I-95/MD 22 interchange in 2004 or 2005.
- The MdTA wetland project for Red House Run stream restoration for the noise wall project is 45% complete.
- The MdTA stream stabilization of Cranberry Run for the HEAT Center project is not yet underway. It is scheduled to begin in Spring 2002.
- SHA fully expects to gain reforestation credit for all 21.59 mitigation acres in calendar year 2001.
- Since 1996, SHA has advertised or provided more than required wetland mitigation. At a minimum, these efforts will continue to meet environmental requirements.

- MDOT will continue its effort to avoid any impacts to the State's resources when undertaking projects. Recognizing that impacts are inescapable with some projects MDOT funds mitigation efforts as planned investments are constructed. In addition to providing required mitigation to address impacts caused by specific projects, MDOT is continuing to invest in programs and projects to enhance environmental resources.

Measures for future consideration/development:

- Highway noise abatement
- Airport noise abatement
- General noise abatement - number of persons exposed to transportation noise levels exceeding State and Federal standards
- MPA mitigation
- Environmental, Cultural, and Community Enhancement Programs

Goal 6 Provide people with transportation choices for convenient, accessible and effective mobility to key destinations

Policy Objectives

- Increase transportation choices available to access and circulate within and between activity centers.
- Increase access to jobs, goods, and services.

Targeted Indicators

- Vehicle miles traveled
- Transit use
- Mode split
- Alternative services access

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Vehicle miles traveled/Transit use/Mode split

One of MDOT's biggest challenges is getting people to regularly use modes other than their cars. Increasing the use of alternatives to the single-occupant vehicle for commute and non-commute trips is key to this issue. A primary indicator of auto use of cars is vehicle miles traveled (VMT). Trends in VMT growth for the state road system and all roads in Maryland are shown in Figure 1. Reduced growth in VMT per capita over time is desired as an indication that people are driving less and using other modes more. Growth in transit ridership and the use of other modes is another means of tracking Marylanders' use of alternatives to cars. Transit ridership data typically come from farebox and electronic farecard transactions, while overall mode choices come from surveys and transportation models that estimate usage. Surveys and models are common means of determining travel patterns, but are extremely expensive and thus are performed only once or twice a decade. Additionally, most of these tools focus only on work trips. For this first report, MDOT is relying on the 2000 Census Journey-to-Work data. These data are relatively comprehensive for each modal choice, but do not provide the exact measures desired: the "modal split" for "total person trips," a fancy way of saying the number of trips taken by each person by transportation mode. Additionally, Census data only provide an estimate based on a sampling process. For future reports, the Department will determine the best means for getting reliable and accurate data that report all types of trips.

Alternative services access

E-MVA – "The Trip You Don't Have To Make" is the goal of increasing the percentage of customer transactions delivered by alternative service delivery such as internet, mail, telephone, kiosks, mobile service center, call center, and County treasurer's offices to conduct MVA business. The MVA offers customers the opportunity to conduct business without going to a branch office, and often without even leaving their home or office. MVA measures the impact of service delivery alternatives by tracking the number and percentage of alternative service transactions.

PERFORMANCE BASE

Vehicle miles traveled/Transit use

Mode	Measure	Data
State Highway Administration	Vehicle Miles Traveled (VMT) per capita (State roads only)	Year 2000: 6,500 VMT per capita
Maryland Transit Administration	Total transit ridership (all systems)	Fiscal Year 2001: 100.4 million trips

Mode split

Distribution of Trips to Work by Mode for Maryland

Mode of Transportation	2000 Number	2000 Percent	1990 Number	1990 Percent	Percent Change
Drove Alone (single-occupancy vehicle)	1,895,582	73.3%	1,732,837	69.8%	9.4%
Carpool (high-occupancy vehicle)	311,511	12.0%	376,449	15.2%	-17.3%
Public Transportation	214,314	8.3%	202,169	8.1%	6.0%
Bicycle	4,579	.2%	4,715	.2%	-2.9%
Walked	60,600	2.3%	83,417	3.4%	-27.4%
Other	14,041	5.4%	18,040	7.3%	-22.1%
Worked at Home	85,646	3.3%	64,835	2.6%	32.1%

Source 2000 United States Census

Alternative services access

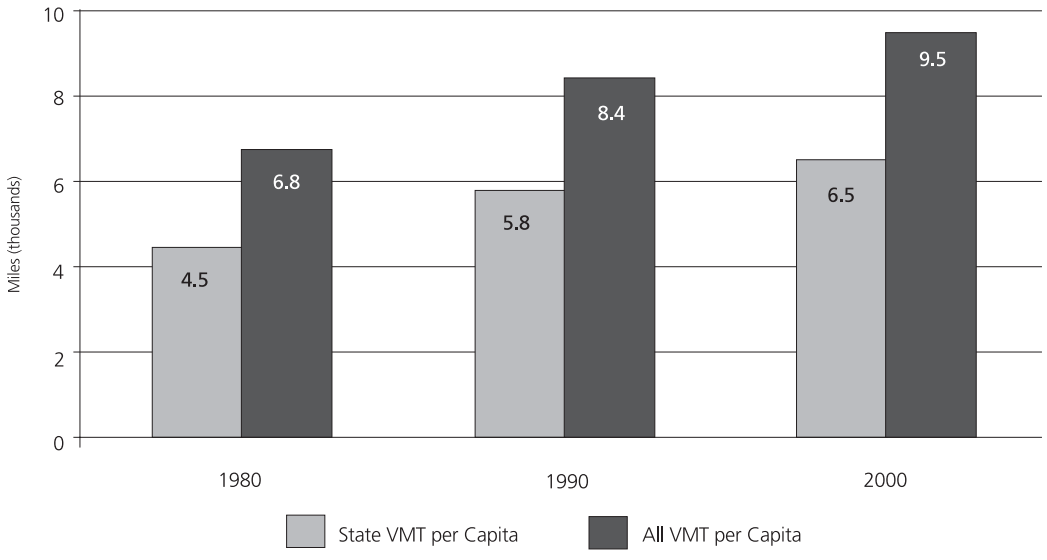
Mode	Measure	Data
Motor Vehicle Administration	Number of Alternative Service Transactions	Fiscal Year 2001: 5.3 million transactions
	Percent of total transactions	Fiscal Year 2001: 42%

TRENDS AND TARGETS

Vehicle miles traveled/Transit use/Mode split

- Over the past decade there has been a reduction in high-occupancy vehicle (HOV) use. MDOT has set a long-term goal and intermediate benchmark to reverse the decline in HOV usage that has occurred during the past decade.
- According to Census figures, bike and pedestrian modes of travel have been declining over the past decade while teleworking or working at home has increased. MDOT's long term goal is to increase the share of person trips made by these modes (bicycle/pedestrian/telework) by ½%. The intermediate benchmark of progress will measure the degree to which the ½% goal is being achieved.
- MTA's long-range goal is to double transit ridership in 20 years. This would bring the overall ridership from 5% to 6% of total person trips. This equates to over 1 million transit trips a day. The intermediate benchmark of progress is the annual increase in transit ridership.
- A number of MDOT investments specifically focus on efforts to increase the number of non-single occupancy vehicle trips. These programs are aimed at providing people traveling in Maryland with transportation choices for convenient, accessible, and effective mobility. One of the goals of investing in projects that provide modal choices is to impact the trends in use of HOV, bicycling and walking.
- MTA's budget includes millions in additional funds for new and enhanced transit services throughout Maryland, made possible by the Governor's Transit Initiative. Among the projects programmed are double tracking the Baltimore Light Rail system, extending MARC service to Frederick and extending the Metrorail Blue Line to Largo. All of these projects are expected to increase ridership.
- MDOT has set a long term goal of reducing the rate of growth in vehicle miles traveled per capita over the next 20 years. This is compared to the trend of increased vehicle miles per capita over the last twenty years. The trend over the past 20 years serves as the intermediate benchmark of progress that future rate of growth in VMT per capita will be measured against.

Figure 1: Annual Vehicle Miles of Travel per Capita
State Roads and All Public Roads



Alternative Service Transactions

- MVA's improvements like the new kiosk and the back-end processing rebuild of the renewal system should result in a continued increase in alternative service transactions.
- A study is underway to determine if incentives similar to those used by other states and private industry will increase the use of electronic or other options.
- MVA's objective to continue increasing the percent of alternative service delivery transactions will be met through development of new information technology systems and changes in consumer behavior. Factors affecting consumer behavior include customer communications and marketing, product-pricing differentials, and consumer confidence in using information.

Measures for future consideration/development:

- Bicycle and Pedestrian Access - miles of sidewalk and bike lanes on State roads and bicycle and pedestrian level of service on the network
- Transit Access - Percentage of households and jobs in Priority Funding Areas within walking distance of transit
- Average transit travel time as a percentage of auto travel time between selected activity centers (destination areas), including walking, waiting, and parking time

Measures for consideration and tracking through State agency partners:

- Percentage of households that can reach shopping, schools, and recreation by walking or biking in 15 minutes
- Percentage of workers within 30 minutes of workplace by transit, walk, bike, high-occupancy vehicle, and driving alone

Goal 7 Provide a transportation system that expands economic opportunities and increases the economic vitality of the State

Policy Objectives

- Target transportation investments to serve existing and growing businesses, as well as housing and commercial markets that support development and redevelopment opportunities consistent with Smart Growth.
- Enhance transportation services and facilities used by business travelers, recreational travelers and tourists.

Targeted Indicators

- Economic impacts
- Economic growth and new business
- Cost of mobility

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Economic impacts

Although everyone agrees that transportation and economic development go hand-in-hand, it is difficult to quantify the relationship between transportation investments and economic growth. Economic productivity is a function of multiple factors, not just transportation improvements. Job growth is a commonly used measure of economic performance and it can be derived by economics. Every few years, MAA, MPA, and SHA calculate the jobs generated by their activities as an indication of economic impact.

Economic growth and new business

Growth in passengers at BWI Airport and cargo at the Port of Baltimore can mean a growth in economic vitality for transportation companies, retail establishments, factories and service businesses. This translates into additional profits, tax revenues, business revenues, and jobs for Marylanders and Maryland businesses. Tracking the number of passengers traveling through BWI provides an indication of economic growth for the airport. Tracking the growth of cargo in tonnage at the Port of Baltimore provides an indirect measure of the economic growth it generates because weight by commodity varies.

Cost of mobility

The percentage of household income spent on transportation related expenditures provides an indication of the affordability and efficiency of transportation. The impact of transportation costs affects income groups differently, with higher income groups spending a smaller percentage of their household income on transportation. Every two years the Federal government releases results from a Consumer Expenditure Survey that provides information on the buying habits of American consumers, including data on their expenditures, income, and consumer unit (household). Although transportation expenditures are influenced by factors outside of MDOT's control, this measure provides an indication of the affordability of mobility.

PERFORMANCE BASE

Economic impacts

Mode	Measure	Data
Maryland Aviation Administration-BWI	Number of direct, indirect, induced jobs affected by investments	Direct Jobs: 12,030 Indirect Jobs: 5,692 Induced Jobs: 6,369
Maryland Port Administration-Port of Baltimore	Number of direct, induced, indirect jobs, and jobs related to activities at the Port	Direct Jobs: 17,700 Indirect Jobs: 14,600 Induced Jobs: 11,300 Related Jobs: 83,100
State Highway Administration	Number of jobs resulting from highway construction	Year 2000: 10,273 jobs

Economic growth and new business

Mode	Measure	Data
Maryland Aviation Administration	Total Passengers through BWI	Year 2000: 19.6 million passengers
Maryland Port Administration	Tons of MPA "general cargo"	Fiscal Year 2001: 6.1 million tons

Cost of mobility

1998-1999 Average Annual Consumer Expenditures

	Washington MSA[4]		Baltimore MSA	
Item	Dollars	Percent	Dollars	Percent
Food	$5,358	11%	$5,165	13%
Housing	$16,386	35%	$13,484	34%
Apparel and Services	$2,279	5%	$1,660	4%
Transportation	**$8,171**	**17%**	**$6,347**	**16%**
Health Care	$2,202	5%	$1,581	4%
Entertainment	$2,261	5%	$2,104	5%
Personal Insurance and Pensions	$5,353	11%	$4,354	11%
Other	$4,791	10%	$5,088	13%
Total	$46,801	100%	$39,783	100%

Source United States Bureau of Labor Statistics 1998-1999 Consumer Expenditure Survey

[4] Washington MSA includes the District of Columbia, and sections of MD, VA, and WV.
MSA = Metropolitan Statistical Area

TRENDS and TARGETS

Economic impact

- The planned $1.8 billion BWI expansion, construction, and capital investment has the potential to generate the following approximate number of jobs (see following table) over the next seven years.

Year	Direct Jobs	Indirect Jobs	Induced Jobs
2000	12,030	5,692	6,369
2001	11,997	5,677	6,352
2002	11,196	5,297	5,927
2003	12,238	5,790	6,479
2004	13,318	6,301	7,051
2005	14,294	6,763	7,568
2006	15,221	7,202	8,058
2007	16,153	7,643	8,552
2008	17,086	8,084	9,046

- Forecasts of BWI Airport passengers are based on trend analysis that indicates steady growth. This will result in increasing job opportunities at BWI Airport. The targets set by BWI airport for job growth relate to the $1.8 billion in planned construction expansion.
- Port of Baltimore activity generates an estimated $1.8 billion in personal income (salary and wages) and $286 million in local and state tax revenue each year.
- MPA cargo facilities are projected to increase at 4% annually according to the Marine Terminal Development Plan 2000-2010. This cargo will support 33,000 total jobs, which is an increase of 51%. Facility investments of $560 million have been identified over the ten-year period to attract the cargo and jobs.

Economic growth and new business

- Total Passengers traveling through BWI during 2001 is forecast to reach 19.6 million.
- Trends indicate continued passenger growth with numbers expected to be more than 45 million by 2025. Use will decline in 2002 by nearly 7 percent, with recovery expected to begin in 2003.
- The decline is expected to result from the weakened national economy and will affect both business and discretionary travel. Recovery is expected in 2003 and growth will reach previously projected levels by 2005.
- By 2010 BWI air traffic is expected to reach just over 30 million passengers with more than 45 million by 2025. This continuing growth trend increases demand on BWI facilities, and it increases job opportunities and revenue.
- BWI's planned transportation investments over the next six years include marketing, additional gates, terminal improvements and expansion. Intermodal development and additional terminal space is being planned for the next ten years.

- By 2003, MAA seeks to achieve an out-of-state market growth of 10% at BWI.
- The economics of the nation and world were sluggish in fiscal year 2001, and international cargo movement decreased. Cargo is likely to continue to be light through 2002. The Port of Baltimore has an advantage due to its very diverse cargo base, (i.e. bulk, containerized and niche cargo) and is well positioned for growth when the economy improves. Additionally, 2000-2001 was a banner period for the MPA in signing long term contracts for commitment from international shippers.

Cost of mobility

- Over the last decade, the household expenditures on transportation have remained fairly constant. A comparison of 1989-90 and 1998-1999 data indicates that in the Baltimore region the percentage of household expenditures rose by .5% and in the Washington region it rose by approximately 1.5%. The variety of external factors that make up the cost of transportation makes it difficult to predict long-term trends. The effect of MDOT investments could be offset by external factors or changes in household spending patterns.
- MDOT investments include projects to provide people traveling in Maryland with transportation choices for convenient, accessible, and effective mobility. By providing modal choices, a household is provided additional flexibility in its transportation expenditures.

Measures for future consideration/development:

- Direct, indirect, and induced jobs from investments in the transit systems
- Total travelers on intercity rail and bus services with an origin or destination in Maryland
- Travel time to BWI Airport from selected major Maryland business centers
- Long-term economic measures
- Monetary impact of MDOT investment on business cost and production; growth using economic input/output model
- New business or businesses retained at the Port of Baltimore

Measures for consideration and tracking through State agency partners:

- Growth in employment (net new jobs) and/or business revenues

Goal 8 Provide for the efficient and reliable movement of goods

Policy Objectives

- Promote a diverse and interconnected system of freight transportation that leads to the efficient and reliable dispersal and transfer of cargo.
- Increase the competitiveness of the Port of Baltimore and BWI Airport cargo facilities and services.

Targeted Indicator

- Freight movement

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Freight movement

Commerce on the freight system is based on a variety of factors, including the level of public and private investment in the system. Although an indirect indicator of health for major freight facilities operated by the State of Maryland, measures relating to amount of cargo moved are used to track freight movement. MAA and MPA track the weight of various types of cargo that moves through their facilities. MTA tracks the number of loaded freight cars on State-owned facilities that use the rail freight network as an indication of the level of commerce on the State rail network.

PERFORMANCE BASE

Freight movement

Mode	Measure	Data
Maryland Aviation Administration	Total pounds of cargo moved at BWI	Year 2000: 520,550 pounds
Maryland Port Administration	Annual tons of foreign cargo (bulk and general) moved through the Port of Baltimore	Year 2000: Foreign Cargo 26.1M tons bulk foreign cargo. 5.7M tons general foreign cargo.
	Tons of MPA "general cargo"	Fiscal Year 2001: 6.1 million tons
Maryland Transit Administration	Annual number of loaded freight cars on State-owned lines	Year 2000: Maryland Midland: 5,742 loaded freight cars Maryland & Delaware: 2,602 loaded freight cars

TRENDS and TARGETS

Freight movement

- BWI's cargo movement grew by 4% in 2000.
- Over the long term, freight/cargo at BWI Airport is expected to grow at an average annual rate of 4.9% through 2025.
- At this time, BWI has no planned freight investments.
- Port of Baltimore freight trends compared to 1999:
  +15.6% bulk foreign
  +8.4% general foreign cargo
- Since 1996, the trend in percentage growth in tons of MPA "general cargo" has been increasing slightly.
- MPA cargo facilities are projected to increase at 4% annually according to the Marine Terminal Development Plan 2000-2010.
- MPA infrastructure investments are essential for this projected cargo growth. The Port must have adequate vessel berths, cranes, and cargo storage space (open and covered), as well as safe and efficient channels, roadways, and rail networks. Planned investments will ensure that the necessary improvements are made for this growth.

Measures for future consideration/development:

- Index of intercity door-to-door shipment times
- Percentage of shipments that have more than one modal alternative available
- Shipper perceptions of freight delivery options, cost, and reliability
- Percentage of commercial truck VMT in urban areas that occurs under congested conditions
- Cargo business development at the Port of Baltimore and BWI Airport

Goal 9 Secure adequate resources to build, operate and maintain a high quality transportation system

Policy Objective

- For every program period, the Department will strive to meet or exceed the capital investment recommendation of the Commission on Transportation Investment.

Targeted Indicators

- Innovative funding
- Funding adequacy

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Innovative funding

It is believed that traditional revenue sources cannot provide sufficient revenue to meet the long-term transportation system needs of the State, counties, and municipalities. Expanding the sources of revenue available for financing transportation beyond the existing gas tax and titling fees will be necessary. Revenues from innovative funding mechanisms are a source of additional funding. These innovative funding mechanisms include: Passenger Facilities Charges applied to passenger tickets at BWI, Customer Facilities Charges applied to rental cars at BWI, and joint development projects including some transit-oriented development projects and parking garages. MDOT also develops innovative financing arrangements with MdTA and the Maryland Economic Development Corporation (MEDCO). These arrangements include grants, loans, bonding conduits, leases, and investments.

Funding adequacy

In 1999, the Committee on Transportation Investment (CTI) was appointed to review Maryland's transportation system and make recommendations on the long-term revenue options and spending level necessary to support a viable transportation system. The Commission
recommended increasing the level of capital investment by $100 million annually to reach a $1.5 billion level of capital investment by fiscal year 2004. To understand if the Department is adequately funding the system as recommend by the CTI, MDOT is measuring the difference between proposed CTI funding level and actual program.

PERFORMANCE BASE

Innovative funding

Maryland Department of Transportation	Innovative Revenues	Fiscal Year 2001: $170 million (estimated)
Maryland Transportation Authority	Cumulative financing of cooperative capital investment with MDOT	Fiscal Year 2000: $540 million programmed

Funding adequacy

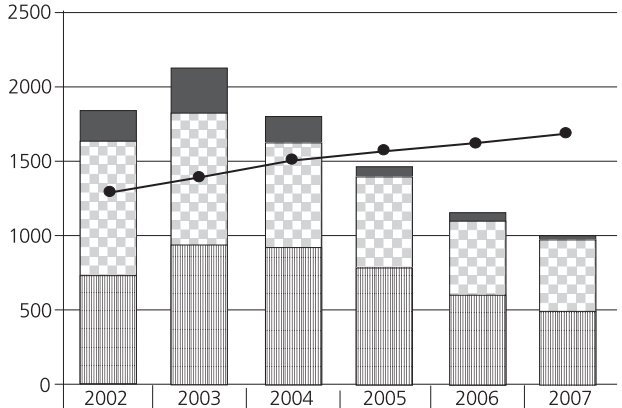
Maryland Department of Transportation	Difference between proposed CTI funding level and actual program	Fiscal Year 2001- Capital Program = $1.307 billion CTI Proposed Funding Level = $1.2 billion Difference: The capital program exceeded the CTI recommendation by $107 million

TRENDS and TARGETS

Funding adequacy

- On average, MDOT's planned capital investments in the capital program will exceed the CTI recommendation over the next 6 fiscal years.
- Over the next 20 years, there is projected to be $27 billion in transportation needs in excess of available funds.

Maryland Department of Transportation
Capital Program vs. Commision Recommendation
FY 2002 - FY 2007
Fall 2001 Estimate



	2002	2003	2004	2005	2006	2007	
Special Financing	166	292	156	52	45	0	
State Revenues & Bonds	794	896	719	620	515	479	
Federal Revenues	862	930	910	790	589	512	
Total	1822	2118	1785	1462	1149	991	**=9,327**
CTI Recommendations	1300	1400	1500	1560	1622	1687	**=9,069**

- In the longer term, the Department will need to look at expanded revenue sources to meet capital needs and achieve the recommended CTI levels of support for the transportation system.
- The CTI recommended the $1.5 billion level of capital investment be increased 4% each fiscal year after 2004 to account for inflation and to further reduce unmet capital needs.

Innovative funding

- Planned investments, such as the BWI airport expansion, will use innovative funding sources to avoid using revenue from other trust fund sources.
- In the longer term, use of innovative funding may increase as it becomes necessary to look beyond current revenue sources to meet the needs of the transportation system.
- MdTA will finance and build new transportation facilities with the Maryland Department of Transportation to meet Maryland's transportation needs.
- It is estimated that in FY 2001 the MdTA's cumulative financing of cooperative capital investment with MDOT will stay at $540 million and increase to $966 million in FY 2002. MdTA's investments are situation specific; therefore, longer-term trends cannot be predicted. Investments will continue to increase over time, but at no established rate of increase.

Measures for future consideration/development:

- Tracking preservation and maintenance costs to life-cycle costs
- Operating efficiencies for each mode as a measure of cost-savings
- Cost savings

Ensure involvement and quality service in the development and delivery of transportation plans, programs, products and services

Goal 10

Policy Objectives

- Involve customers in transportation decision-making from the onset of systems planning through project development and design.
- Improve internal accountability of all modes' performance through the Managing for Results Initiative.
- Improve customer access to transportation products, information and services.

Targeted Indicators

- Customer satisfaction
- e-Government

MEASURES DESCRIPTION, PURPOSE, AND QUALITY

Customer satisfaction

Various modes engage their customers in surveys in an effort to ensure satisfaction with their services and products. Of interest is the proportion of respondents that are reasonably satisfied with the quality of services and facilities provided. The percentage of agencies successfully meeting their targets is an important indication of the quality of service provided to MDOT customers. MTA conducts an annual customer satisfaction survey prepared by the MTA Office of Marketing. MPA surveys all vessel operators and stevedores for every vessel docked at an MPA terminal. MVA's Operations Research Division conducts a quarterly survey for customer comments at each branch office. SHA surveys external customers on their performance.

e-Government

In 2000, the Governor signed into law the Electronic Government Initiative, the purpose of which is to aggressively pursue universal citizen access to the government electronically. A time line for agencies to make services available to the public over the Internet was legislated as part of the initiative (50% by 2002, 65% by 2003, 80% by 2004). The ultimate goal is for every agency to make services available electronically so that citizens can conduct and complete business transactions 24-hours-a-day, 7-days-a-week from the home, office, or a public access point.

MDOT conducted a comprehensive inventory of information and services it provides and identified approximately 800 information or service items. The information and services inventory identified the current state of web-enablement and assessed the potential level of web-enablement for each item inventoried. MDOT now tracks progress of its information and services that could be web-enabled and calculates the percentage currently available on the Internet with the target of improving customer access to MDOT services through e-commerce and e-information.

PERFORMANCE BASE

Customer satisfaction

Mode	Customer Satisfaction	Data
Motor Vehicle Administration	Percentage of branch office customers rating service as good or very good	Year 2001: 91%
Maryland Transit Administration	Percentage of riders rating overall MTA effectiveness as excellent, very good, or good	Year 2000: 85%
Maryland Port Administration	Percent of satisfied customers[5]	Year 2000: 95.3%
State Highway Administration	Percent of external customers survey responses rating SHA performance at B or better	Year 2000: 81%

[5] This information is compiled weekly and sample is used for the annual measurement

e-Government

WEB-ENABLED STATUS NOVEMBER 2001

Maryland Aviation Administration	31%
Maryland Transportation Authority	71%
Maryland Port Administration	50%
Maryland Transit Administration	44%
Motor Vehicle Administration	66%
State Highway Administration	44%
Total	46%

TRENDS and TARGETS

Customer satisfaction

- MDOT customer satisfaction ratings are very high.
- In the future, customer satisfaction is anticipated to remain strong as MDOT continues its commitment to meeting the needs of our customers. Investments in new technology, training and customer service along with the involvement of customers in projects and planning support this commitment.

e-Government

- Modal web-enablement plans have been developed to further web-enable services to meet the e-Government legislative objectives of 50% by 2002, 65% by 2003, and 80% by 2004.
- In addition to meeting the required e-Government web-enablement objectives, MDOT's ultimate objective is to achieve the maximum potential level of web-enablement for each inventory item.

Measures for future consideration/development:

- MdTA customer service
- MAA customer service
- Rating of customer perceptions on various transportation related themes
- Attainment of Managing For Results Measures

MTP *Goals* and the 2001-2006 Consolidated Transportation Program

The MTP goals and objectives provide the basic vision, policy framework, and context for why the State invests in the projects that it does. Every three years MDOT re-examines the MTP goals and objectives to ensure that the document remains relevant. These goals and objectives are changed as new or pertinent information becomes available. Each year the Department develops the CTP, a six-year program of capital projects. The process of identifying and prioritizing projects in the CTP is multi-faceted. Each document serves a distinct function and builds upon one another.

The 2002 MTP preserves the goals of prior MTPs and provides more detail, demonstrating a link between the MTP and CTP. The 2002 Plan revalidates the existing priorities and policies, and integrates new priorities. Developing and instituting any policy, program or project is done in a dynamic environment. That dynamic environment has many factors that animate it. For instance, it takes years to plan and program many of our transportation projects. Because the scope of major transportation programs is often broad, it is difficult to immediately demonstrate results. Some important factors are: economics, the existing transportation system, local tastes and preferences, established and planned land use patterns, and politics. All of the projects, programs, and other investments the State makes, including operating expenditures, are done in an increasingly complex environment. MDOT has and will continue to successfully implement the goals and objectives of the MTP through the CTP. Through the Attainment Report, MDOT can demonstrate and ensure it has identified the right mix of projects and investments needed to achieve its goals and objectives. This process will be bumpy at first. This year's Report is the first attempt to analytically demonstrate how MDOT distinguishes benefits from investments that meet a given goal versus investing in competing goals. Measuring common outcomes with so many different players, assessing the role and contribution of different investment types to the performance outcomes, and making this understandable will be challenging. It is anticipated that the measurement tools, data used, and project priorities will be adjusted in future years in response to lessons learned.

The following sections demonstrate some of the complex relationships between projects implemented and system performance. Specific performance issues focused on include a concept referred to as "induced" travel demand that results from capacity enhancements and the anticipated effect of Transportation Demand Management programs and projects on reducing auto travel. From these discussions, one can see how difficult the task is of addressing a fundamental transportation problem: congestion on our roadways.

Induced Travel

Induced travel is typically associated with the phenomenon of building additional roadway lanes to relieve congestion only to have the new lanes become congested soon after the facility is opened. While it is difficult to determine the exact causes of induced travel, academic literature generally supports the theory that new and improved transportation facilities can cause an increase in travel. This is especially true if the transportation improvement provides significant timesavings.

Induced travel can be viewed as positive or negative depending on the relationship of a transportation improvement project to planned growth. If the improvements are made in a manner that benefits unplanned growth or sprawl development, increases in travel that result in undesired and longer trips can result. Transportation improvements that support planned growth and development patterns may induce different types of travel, such as shorter automobile trips and increased use of transit, walking, and biking. In Maryland, the number of vehicle miles traveled per year is growing at a much faster rate than the rate of population growth. Because many parts of Maryland are struggling with air quality conformity, the State does not want to see vehicle travel increase. As a result, the Maryland Department of Transportation needs to carefully consider the projects it funds and implements to ensure that if the project does create induced travel it results in a positive rather than negative impact.

Many of the projects in the CTP are not anticipated to cause induced travel. System preservation projects such as safety improvements, bridge replacements, and reconstruction and rehabilitation activities do not generate considerable time savings, and therefore play a small role in increasing demand for travel. Projects that provide small savings in time, such as signalization improvements and left turn lanes, are also unlikely to induce travel as the time savings is not significant.

A subset of CTP projects will provide significant timesavings. However, because induced travel is a dynamic phenomenon - as more people travel on the new facility speeds decrease and thus induced travel decreases, the induced travel impacts of these projects will vary and are difficult to calculate.

Because induced travel demand is so dynamic, there is not yet a clear understanding of the specific factors that cause induced travel demand to occur. Growth in travel is caused by many factors including auto-based development patterns, economic development activities, and population increases. However, implementing Maryland's Smart Growth initiatives provide a strong method for reducing some of the travel demand created by sprawl development. Another factor that complicates the study of induced travel is determining the appropriate level of analysis. Transportation improvements can have two impacts – 1) creating new travel demand and 2) redistributing existing travel. If travel demand is evaluated on the corridor level, redistributed travel appears to be new travel demand. However, if demand is evaluated at the regional level, demand has remained constant.

Before a project's impact on induced travel can be evaluated, first it will be necessary to account for non-improvement factors that could increase travel and to assess whether the new demand that is occurring is new trips or redistributed trips. Because the transportation field does not yet have a comprehensive understanding of induced travel, it is premature for Maryland to develop specific approaches for assessing the impact a project has on induced travel. And because there is not a good way to assess a project's impact on induced travel, it is premature to develop specific strategies to address induced demand. However, MDOT will continue to investigate methods to accurately assess induced travel.

The Role of Transportation Demand Management in Reducing Auto Travel

Maryland's transportation system includes a variety of state and local transportation demand management (TDM) strategies. Many of these strategies to reduce Maryland's growth of vehicle trips and vehicle miles traveled have been incorporated into air quality plans. In addition to improving air quality, TDM strategies can also play an important role in addressing congestion, environmental, safety, and quality of life issues associated with ever-increasing demand for automobile travel.

The tabel below shows the reduction in annual vehicle trips and vehicles miles traveled of each Emission Reduction Program for the Baltimore and Washington Regions.

TRANSPORTATION EMISSION REDUCTION MEASURES (TERMS) IN 2000

Program	Daily Reduction in Vehicle Trips	Daily Reduction in Vehicle Miles Traveled
Telecommunication Resource Center	34,910	606,908
Employer Outreach for Bicycles	125	550
Employer Outreach	7,258	90,000
Guaranteed Ride Home	412	13,069
Commuter Operation Program	1,054	32,253
College 33 Program Bus	2,270	24,971
Telework Partnership	4,875	273,000
Transit Store in Baltimore	794	7,940
Commuter Choice	2,000	20,000
Park and Ride Lots		
I-70 & MD 66 - Washington Co.	92	7,728
I-95 & MD 152 - Harford Co.	182	9,282
MD 2 & MD 262 - Calvert Co.	129	9,159
Total	**54,101**	**1,094,860**

In addition to the TERMS that are listed above, programs such as roadway and parking pricing initiatives, commute trip reduction activities, High Occupancy Vehicle lanes, transit improvements, rideshare programs, and land use and urban design are also part of the TDM strategies. These programs are not included because MDOT is not currently able to quantify the program's ability to reduce demand for automobile trips. However, as it becomes possible to quantify a particular strategy's ability to reduce the number of automobile trips it can be added to the table.

Cost-Effectiveness

The language contained in the Transportation Performance Act (SB 731)–and consequently the language in this Attainment Report–focuses primarily on assessing the effectiveness of MDOT's transportation program at meeting the goals of the MTP. However, SB 731 also specifically requires MDOT to assess whether its capital program represents the most cost-effective approach to achieving the State's transportation goals and whether, by implication, future transportation programs should and/or could be structured differently. This requirement applies not only to "relevant" MTP performance goals, but to congestion- and cost per passenger mile-related aspects of projects included in MDOT's capital program. This section of the attainment report addresses the cost-effectiveness issues raised by SB 731.

Challenges to Assessing Cost-Effectiveness

Assessing cost-effectiveness with the specificity that SB 731 requires is deeply challenging. In part, this is because the Department has not historically gathered data that supports this type of assessment. More importantly, assessing cost-effectiveness requires developing comparable cost-per-unit measures, so that multiple approaches to the same goal can be compared dollar-for-dollar. In a Department where unit measures of, for example, safety, vary sharply from mode to mode, it is difficult to compare a dollar's investment in highway safety with a dollar's investment in transit safety with a dollar's investment in aviation safety. This is because the most relevant measures of highway safety differ substantially from those used in the transit and aviation sectors. Highway safety measures typically focus on user safety on a "per unit of highway use" basis (e.g., total fatalities, pedestrian fatalities, or accidents per vehicle mile traveled), whereas transit measures tend to reflect safety for both users and operators, and aviation safety measures tend to reflect accident rates for a type of travel rather than a unit of travel such as a single trip or number of miles traveled.

Additionally, not all modes track project costs similarly. The SHA tracks costs on a per project basis according to capital cost differences, rather than on a cost-benefit or cost-effectiveness basis. SHA's Context Sensitive highway design programs may increase the costs per passenger mile of these projects, particularly in relation to their effectiveness in addressing congestion. These programs are used specifically to meet other Department goals, such as increasing multimodal use of a travel corridor and improving a community environment as a means to promote economic development consistent with Smart Growth. And although these projects may draw cars off the roads by increasing the ability to use these corridors by pedestrians, cyclists, and in some cases transit, it is anticipated that the costs would remain high with respect to their associated effect on congestion. These difficulties help to explain why cost-effectiveness measures across MTP goals, levels of congestion, and passenger-mile effects are often not readily available.

An additional challenge to assessing the cost-effectiveness of MDOT's program relates to the question of whether cost-effectiveness assessments should be based on the annual transportation program as a whole, or whether assessments should be conducted of each of the 700+ individual projects that the CTP contains. SB 731 does not specify an approach to this requirement, and MDOT observes significant issues with each as described on the following page.

Cost-effectiveness analysis, project-by project:

- When addressing cost-effectiveness for each project across 10 MTP goals–plus a congestion measure and a cost per passenger mile measure–what process should guide the Department in terms of selecting "relevance" for cost-effectiveness assessment, and how should the Department interpret poor cost-effectiveness for measures that are not critical to a particular project's motivation and benefits?
- Will the Department have the resources to conduct this assessment–assuming it is possible to standardize measures of cost-effectiveness across modes–for each of the 700+/- projects in the capital program each year?
- How much should MDOT's cost-effectiveness assessments reflect the cost-effectiveness assessments made earlier by the local jurisdictions whose transportation and land use-planning priorities the CTP frequently responds to?

Cost-effectiveness, program-by-program:

When addressing these same cost effectiveness questions at the program level, many similar issues arise, albeit in the aggregate. For example:

- Should the Department subdivide the program into regional units of analysis?
- Should the Department sum the costs of projects that have a similar primary motivation; e.g., economic development, system preservation, or safety, and use that aggregate cost as the basis for a cost-effectiveness assessment?
- And when assessing cost effectiveness in the aggregate across goals, how should the Department weigh one MTP goal compared to another to assess whether a given dollar would be spent more cost-effectively, for example, on environmental stewardship compared to mobility enhancement?

Responding to the Challenge

At the same time, MDOT recognizes the imperative (and seriousness) of addressing cost-effectiveness measures as required by SB731 and, more broadly, as responsible stewardship of public funds. As a result, the remainder of this section discusses cost-effectiveness measurement issues on a goal-by-goal basis; qualitatively characterizes the Department's efforts to meet MTP goals as cost-effectively as possible; quantitatively characterizes the Department's efforts to meet MTP goals where data are available; and recommends a goal-specific approach-where appropriate-to addressing the imperative for meeting cost-effectiveness assessment requirements in upcoming years.

Cost-Effectiveness Measurement Issues by MTP Goal

Goal 1: Smart Growth, Smart Transportation

The MTP's Smart Growth goal requires the Department to lead the development of transportation investments and facilities that support Smart Growth. Again, by definition, this goal is designed to achieve cost-effectiveness in the transportation system through concentrated development patterns that emphasize use of existing infrastructure, reduce the length of trips, and encourage the use of energy-efficient and non-motorized modes such as transit and biking. Again, we believe this goal is more of a "statewide leadership parameter" than a goal that can be met more or less cost effectively.

Goal 2: System Preservation

The MTP's system preservation goal requires the State to meet the maintenance needs of the State's existing infrastructure before investing in, and incurring maintenance liabilities for, system expansion. This goal is more of an "investment parameter" than a goal that can be met more or less cost effectively. Consequently, the Department does not believe that a cost-effectiveness discussion is required for this goal.

Goal 3: Transportation Facility and System Performance

The MTP's system performance goal requires the State to manage its transportation system using an ethic of system optimization and performance maximization. The purpose of this goal is to minimize costs by fully utilizing the capacity of the transportation system before investing in new or improved facilities. Particularly for our highway and aviation systems, this goal specifies our primary strategy for reducing congestion: to distribute use in the most cost-effective means possible before making further capital investments to expand capacity. As such, this goal is more of a "system management parameter" than a goal that can be met more or less cost-effectively.

Historically, the Department has not analyzed the relative cost-effectiveness of alternative responses to traffic congestion changes or user costs per passenger mile, and currently, there is no data available to characterize cost-effectiveness in these areas. In coming years, MDOT and its modal administrators will explore ways to develop cost-effectiveness measures in these areas, to present cost-effectiveness data in these areas more discretely, and to present more explicitly the Department's efforts to meet cost-effectiveness goals cost-effectively.

Goal 4: Safety and Security

The introduction above identifies a number of issues that complicate assessments of cost-effectiveness for the safety goal and that do not need to be repeated here. Selected examples of how MDOT addresses cost-effectiveness concerns in its safety programs despite the challenges discussed are presented below.

For SHA, safety-related costs are incurred primarily in system preservation and capital improvement costs, although the SHA does cost analysis comparisons within their safety-specific system preservation programs. For example, with the Safety and Spot Improvement Program, SHA calculates benefit-cost ratios to measure and compare various alternative improvement strategies. To a certain extent, costs are also incurred in the Maryland State Trooper traffic enforcement efforts. Safety concerns are reflected in all capital improvement and system preservation projects that SHA undertakes, not just specific safety-oriented projects. No data exists tabulating safety-related project costs for SHA projects. SHA staff actively participate in national-level professional discussions on how to engineer safety features into planned improvements so that safety concerns are addressed in road improvements as a matter of course. Additionally, MDOT tracks traffic accident and fatality rates by state facility. State resources are prioritized to areas that experience the highest accident rates.

For the Maryland Aviation Administration, many of the most visible safety-related expenses have been operating costs incurred by the airlines, such as airport security. The transfer of this and other costs to the Federal Government will permit the MAA to continue to emphasize providing facilities that balance commercial airline operational needs with facility designs that make security and safety functions less costly and more reliable.

For the Maryland Transit Administration and the Maryland Port Administration, safety and security issues are addressed primarily through operating practices rather than investments in either projects or operations. It should be noted that many of the technologies deployed to support core functions of the MTA and MPA are selected for their ability to increase safety and security for both operators and users.

In upcoming years, MDOT and its modal administrations will explore methods to identify the Department's safety-related expenditures more discretely and to present more explicitly the Department's efforts to meet safety and security goals cost-effectively.

Goal 5: Protecting Maryland's Environment

As with safety, the most relevant measures of environmental stewardship vary from mode to mode. SHA and MAA investments require stewardship across a range of water quality, air quality, and community supportiveness issues, although the geographies of their stewardship differ markedly from one another. MPA and MTA investments primarily emphasize stewardship of the State's water resources.

As with safety-related expenditures, environmental stewardship-related expenditures often are incorporated into the overall design and costs of transportation projects and are not, and sometimes cannot be, broken out separately.

Nonetheless, it is the case that the Department has taken a number of concrete steps to address environmental stewardship goals as cost effectively as possible. SHA's efforts to implement low-impact development principles in its stormwater management program have already resulted in clear-cut cost-effectiveness success stories. Whereas SHA's traditional stormwater management methods have emphasized directing water away from facilities through pipes and culverts to detention ponds, new low-impact development (LID) approaches aim to promote infiltration and treatment of stormwater as much as possible on site. In practice, this means using more permeable surfaces, directing runoff to swales, and in general minimizing the need to build new structures. Because fewer structures are needed to treat comparable runoff volumes using LID approaches, LID approaches have been shown to meet the Department's water quality stewardship goals to comparable standards at lower cost, and represent a truly successful cost-effectiveness approach to environmental stewardship. The Department is currently exploring opportunities to apply the LID methods that SHA has pioneered within the Department to other modal administrations.

In upcoming years, MDOT and its modal administrations will explore methods to identify the Department's environment-related expenditures more discretely and to present more explicitly the Department's efforts to meet environment and community stewardship goals cost-effectively.

Goal 6: Providing Mobility and Accessibility with Transportation Choice

The MTP's transportation choice goal requires that the Department provide people traveling in Maryland with transportation choices for convenient, accessible, and effective mobility to key destinations. In essence, this is a social equity goal that emphasizes the need to provide ALL Maryland citizens with mobility options whatever their personal means. As a result, it may not always be appropriate to apply efficiency-focused cost-effectiveness standards to the costs of meeting ones goal.

Currently, the Department does not systematically collect and report cost-effectiveness data for meeting its transportation choice goal. However, the Department believes that it should aim to meet the State's transportation choice goal as cost-effectively as possible, and in upcoming years, MDOT and its modal administrations will explore methods to identify the Department's choice-related expenditures more discretely and to present more explicitly the Department's efforts to meet transportation choice goals cost-effectively.

Goal 7: Supporting the State's Economy

This goal requires that the Department provide a transportation system that expands economic opportunities and increases the economic vitality of the State. From a cost-effectiveness point of view, meaning, the State's performance for this goal should be similar to measuring performance for the State's safety and environmental stewardship goals. In practice, however, safety and environmental stewardship outcomes can be measured more discretely, and are linked more tightly to facility design attributes, than economic growth and development outcomes, which are complicated by lag times in impact and broader economic conditions.

For these reasons, the Department has not historically collected cost-effectiveness performance data for this goal. In upcoming years MDOT and its modal administrations will explore methods to identify such data.

Goal 8: Moving Goods

This goal requires that MDOT provide for the efficient and reliable movement of goods within the State. While cost-effectiveness concerns are prominent in all Department plans for achieving the State's freight mobility goals, no data is currently available that systematically addresses the cost-effectiveness of the Department's efforts in this area.

In upcoming years, MDOT and its modal administrations will explore methods to identify the Department's freight mobility-related expenditures more discretely and to present more explicitly the Department's efforts to meet freight mobility goals cost-effectively.

Goal 9: Funding Our Transportation Future

The MTP's system funding goal requires the State to secure adequate resources to build, operate and maintain a high-quality system. Currently, no data are kept related to the cost-effectiveness of achieving this goal. In upcoming years, MDOT and its modal administrations will explore methods to present the Department's efforts to meet its system funding goal cost-effectively.

Goal 10: Serving Our Customers

The MTP's customer service goal requires the State to ensure involvement and quality service in the development and delivery of transportation plans, programs, products and services. Currently, no data are kept related to the cost-effectiveness of achieving this goal. In upcoming years, MDOT and its modal administrations will explore methods to present the Department's efforts to meet its customer service goal cost-effectively.

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