Intermodal or Multimodal: It’s About People and Freight – State of the Practice

Mobility Performance Management:
Maryland State Highway Administration’s
Performance-Based Approach for Improving Mobility, Reliability and Multi-modalism

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Office of Planning and Preliminary Engineering
Maryland State Highway Administration
About Maryland SHA

- Maryland is home to 6 million people with lots of geographic and socio-economic diversity
- SHA operates and maintains the numbered, non-toll routes in - 17,000 lane-miles and 2,576 bridges
- SHA roadways serve 65% of state VMT and 85% of truck VMT
# SHA Decision-making Framework

<table>
<thead>
<tr>
<th>WHY?</th>
<th>HOW?</th>
<th>WHAT/ WHEN/ WHERE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals/ Needs</td>
<td>Process/ Program</td>
<td>Projects/ Outputs</td>
</tr>
<tr>
<td>SAFETY</td>
<td>CSIS/ CSIL RSA/ PRSA Safety Corridors</td>
<td>Spot/ Corridor Level Safety Improvements Major/Mid-Major</td>
</tr>
<tr>
<td>SYSTEM PRES.</td>
<td>Transportation Asset Management Systems (Pavement, Bridges, Signals)</td>
<td>Resurf, Bridge Repair/ Rehab., CC Adaptation, Signals, etc.</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td>Green Infrastructure Carbon Neutral Corr.</td>
<td>SWM Facilities Reforestation TMDL Reductions</td>
</tr>
</tbody>
</table>

**Outcome**
Safe, well-maintained and reliable highway system for Maryland’s communities, economy and environment
Key Drivers for Performance based Approach

- Support MDOT & Administration initiatives, policies and goals.

- Statutory Regulatory Requirements
  - Managing for Results (MFR)/StateStat
  - MDOT Attainment Report
  - Government Performance and Results Act (GPRA)

- Ensures agency accountability with reliable data and processes

- Target Setting and Outcome oriented approach
Performance Management at SHA

- Performance Management and Data driven decisions at all levels
- Increased focus on Operations
- System Efficiency & Reliability key
- Freight movement and Economy
- Communicating Performance
Various objectives, performance measures and strategies to achieve SHA Mobility goals

Key Areas

- MOBILITY AND RELIABILITY
- INCIDENT MANAGEMENT AND TRAVELER INFORMATION SYSTEMS
- MULTIMODALISM/ SMART GROWTH
- FREIGHT

MD Annual State Highway Mobility Report
Maryland State Highway Annual Mobility Report

Background

- Developed to document key initiatives at SHA as it relates to Mobility KPA
- Started in 2012...in the third year of publication
- Exemplifies SHA data and performance based decision-making framework
- Built around a theme of:
  What’s happening?
  What is SHA doing?
  What is the outcome?
Mobility Trends – What is Happening?

Welcome to the Mobility and Economy Dashboard for the State of Maryland!

The Maryland State Highway Administration's (SHA) mobility related efforts are highlighted in this dashboard based on data from the Maryland State Highway Mobility Report. Mobility is a key performance area (KPA) at SHA which aims to “Support Maryland Economy and Communities with Reliable Movement of People and Goods”. This dashboard aims to identify successes, challenges, and strategies being utilized to improve the transportation services SHA delivers to Marylanders and the traveling public. This effort aims to drive investment related decisions and make the best use of transportation revenues using data-driven performance-based approaches.

What are the Mobility Trends in Maryland?
Maryland’s highway system handles over 56 billion vehicle miles of travel on an annual basis. SHA has developed comprehensive performance measurement systems. In 2013:

- Congestion Costs: 39%
- System Reliability
- Vehicle Miles Traveled: 0.2%

What is SHA doing to address Mobility Challenges?
SHA implements various projects, programs, and policies to enhance mobility on its facilities. Our approach includes:

- Capital Improvements
- Signal Systems
- Mode Choices
- CHART System
- MDTA Toll Lanes
- Freight Policies

What is the outcome of SHA’s Mobility Initiatives?
The mobility solutions implemented by SHA projects, programs, and policies result in user cost savings for automobile and truck travel. In 2013, annual user savings included:

- $1.16 Bil. CHART
- $5.7 Mil. Capital Improvements
- $39.8 Mil. Signal Systems & Multimodal Strategies
- $1.206 Bil. Total Savings

Disclaimer: This application is intended to serve as a public resource for general reference. The data is preliminary and subject to change. SHA provides this information without any warranty of any kind, either expressed or implied.
Mobility/Reliability Performance Management

GOOD DATA DRIVING DECISIONS...
Improving Reliability

**CAUSES OF UNRELIABILITY**

- Inclement Weather
- Fluctuations in Demand
- Crashes
- Work Zones
- Poorly Timed Traffic Signals

SHA developed a Reliability Roadmap in Summer 2014

Phased Approach to develop a comprehensive program that improves reliability of our system

SHRP2 Projects will be used to execute Roadmap task activities.
What is SHA doing?

What is the OUTCOME?

– Projects
  • Major and Minor Projects

– Programs
  • Signal retiming
  • CHART/Incident Management
  • ITS/511

– Policies
  • Park N Ride
  • HOV Users
  • Reversible Lanes
  • Bicycle & Pedestrian
  • Transit Oriented Development
  • MDTA Toll Lanes

What is SHA doing to improve Mobility of our highway system?
SHA implements various projects, programs and policies to enhance mobility on its facilities.
Our approach includes:

- CHART System
- Capital Improvements
- Signal Systems
- EZPass
- Freight Policies
- MDTA Toll Lanes
- Mode Choices

What is the outcome of SHA’s Mobility Initiatives?
The mobility solutions implemented by SHA projects, programs and policies result in user cost savings for automobile and truck travel.
In 2013, annual user savings included:

$1.16 Bil. + $5.7 Mil. + $39.8 Mil. = $1.206 Bil.

- CHART
- Capital Improvements
- Signal Systems & Multimodal Strategies
- Total Savings
SHA Congestion Management Program

- Performance based approach to identify and implement high benefit-low cost projects on freeways and arterials
- Adopts a systemic data driven approach of
  - Diagnosis
  - Analysis
  - Selection
  - Implementation
  - Assessment
Freeway Congestion Management Program

- Identify Congestion Hotspots and Sources using vehicle probe speed and traffic counts
- Develop Traffic Simulation Models to evaluate Low Cost Short Term Improvements analyzed in a Benefit/Cost Context
- Projects carried forward thru’ Design and Construction
Arterial Congestion Management Program

- Identify Congestion Hotspots and develop low cost improvements
- Concepts have overall system level positive impacts
- Concepts analyzed in a Benefit/ Cost and Life-Cycle Context
- Projects carried forward thru’ Design and Construction

SHA 2014 Arterial Congestion Management Study identified 15 projects with a total cost of $40 Million and projected benefits of $900 Million over 20 years
Before/ After Studies

• Critical to understand the **OUTCOME** of the transportation investment
• Feeds into the **SHA Business Plan performance metrics reporting**

  *e.g* Congestion relief projects that opened to traffic in 2013 provided $5.7 Million/ year in user cost savings

• Provides insights to see what works and lessons learnt for future projects
• Data driven approach increases **transparency and accountability**
Before/After Study Example
Inter County Connector

<table>
<thead>
<tr>
<th>Condition</th>
<th>AM Peak Hour (8:00-9:00 am)</th>
<th>PM Peak Hour (5:00-6:00 pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncongested</td>
<td>Moderate 29%</td>
<td>Moderate 24%</td>
</tr>
<tr>
<td>Light</td>
<td>Severe 11%</td>
<td>Severe 8%</td>
</tr>
<tr>
<td>Moderate</td>
<td>Light 36%</td>
<td>Light 31%</td>
</tr>
<tr>
<td>Severe</td>
<td>Uncongested 24%</td>
<td>Uncongested 20%</td>
</tr>
<tr>
<td>After</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncongested</td>
<td>Moderate 22%</td>
<td>Moderate 24%</td>
</tr>
<tr>
<td>Light</td>
<td>Severe 5%</td>
<td>Severe 5%</td>
</tr>
<tr>
<td>Moderate</td>
<td>Light 27%</td>
<td>Light 29%</td>
</tr>
<tr>
<td>Severe</td>
<td>Uncongested 46%</td>
<td>Uncongested 42%</td>
</tr>
</tbody>
</table>

Before: 20% Uncongested, 41% Moderate, 8% Severe
After: 46% Uncongested, 24% Moderate, 5% Severe
How has Mobility related efforts impacted decision-making?

• Great step demonstrating Performance based Planning and Data Driven Decision-making
• Helps senior management with funding decisions – multiple low cost short term improvements on have been identified and implemented
• Multiple Mid term/ Long term corridor studies have been re-evaluated and initiated
• Better prepared to account for Freight and Reliability
• Helps us communicate our performance and tell our side of the story
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