Challenges for Multi-modal Transportation in Pennsylvania

October 21, 2013

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APA-PA Presentation
2013 Annual Conference
October 21, 2013

Agenda

• Welcome and Introductions
• Background/Overview
• Plan Directions
• Comprehensive Freight Movement Plan
• Draft Modal Needs
• Baseline Revenue and Projections
• Project Prioritization Process
• Modal Scenarios Introduction
Plan Background/Overview

Stakeholder Participation

- Eight Stakeholder Webinars
- Website interaction
  - http://paontrack.com/
  - Voice Your Opinion Polls
  - Surveys
- State and local conferences
- External stakeholder engagement (this Winter)
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PennDOT owns, operates, and maintains 40,000 miles of roadway.

- PennDOT owns, operates, and maintains 40,000 miles of roadway.
- Highways
  - Ranks 5th in the nation in total mileage of state-owned roadway
  - Ranks 6th in the nation in vehicle miles traveled
  - Ranks 6th in the nation in total Interstate mileage
    - 1,855 miles
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Roadway Preservation

- **8,452** miles of highway have a poor rating and need improvement.
- Implications
  - Current funding levels are **forcing lower-cost treatments** to be performed instead of the full scope of needed repairs and reconstruction.
  - Each year PennDOT gets **further behind**.

Bridges

- PennDOT owns, operates, and maintains more than **25,000** bridges
- Bridges
  - Ranks **3rd** in the nation in number of state-owned bridges
  - More than **25,000** bridges
  - **4th** oldest bridge inventory in the nation
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Structurally Deficient Bridges

• Statewide, 4,476 bridges require near-term improvements.
• Implication
  – If money is not available to fix, bridges must be *weight-restricted* and ultimately closed.
  – This forces *change in traffic flow*—already being experienced by hundreds of Pennsylvania communities—overburdens other routes and adds significant delays to commutes and deliveries.
  • “Additional miles will add $200,000-$300,000 to Armstrong’s transportation costs.”—WSJ article, Oct. 14, 2013

Pennsylvania Modal Facts

• Public Transportation
  – 37 urban and fixed route transit systems
  – 58 shared-ride/demand response operators
  – 5,500 transit vehicles
  – 400 million trips per year
  – Philly’s system ranks *5th* nationally
  – Pittsburgh’s system ranks *21st* nationally
  – Transit service is provided throughout all *67* counties
Pennsylvania Modal Facts

• Intercity Rail
  – AMTRAK provides daily services with 120 trains and 24 stations
  – AMTRAK operates 5 corridors
  – Keystone Corridor (Harrisburg-NYC, via Philly) ranks 4th in nation
    • 1.2 million annual passengers
  – 3.9 million passengers used Philadelphia’s 30th Street Station

• Aviation
  – 134 public use airports
  – 313 private use airports

• Bicycle and Pedestrian
  – Nine designated BicyclePA routes
    • 2,200 miles
Pennsylvania Modal Facts

• Rail Freight
  – 4 Class I railroads
  – 5th largest rail system in the nation
  • 60 railroads operating 6,000 miles of track
  – Largest short-line and regional rail line network in the nation

• Ports
  – 3 major ports
  – Total trade
    • Philadelphia ranked 21st nationally (34.0 MT)
    • Pittsburgh ranked 22nd nationally (33.8 MT)
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Population Change

Population Change is the rate of change in population between decennial census years. While every census region grew considerably during the twentieth century, the South and West experienced the largest increases in population.

- Pennsylvania 1990 to 2000
  - Population Change: +3.4%
  - Prox. 12,702,379

Population is Shifting

2010 Census Results

Pennsylvania

Population Change by County, 2000-2010

- 2010 Census Results
- State Population: 12,702,379

State Population by Race

- Percent of Population
- Change 2000-2010

- White alone: 87.7%
- Black or African American alone: 17.0%
- American Indian and Alaska Native alone: 0.2%
- Asian alone: 0.3%
- Native Hawaiian and Other Pacific Islander alone: 0.1%
- Some Other Race alone: 0.7%
- Two or More Races: 0.2%
- Hispanic or Latino: 33.6%
- Non-Hispanic or Latino: 66.4%

State Population by Hispanic or Latino Origin

- 2010 Census Results

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Population Density

Population density is a measure of average population per square mile. Density levels have been higher across the Eastern seaboard and the Pacific coastline and lower in much of the West.

Population Density in 2010

<table>
<thead>
<tr>
<th>Density Rank</th>
<th>Population Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>#11</td>
<td>283.9 people/sq. mi</td>
</tr>
</tbody>
</table>

U.S. Avg.: 87.4

Municipalities with Comprehensive Plans (2010)
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Municipalities with Zoning Ordinances (2010)

Municipalities with Subdivision & Land Development...
Plan Directions:
Goals, Objectives and Performance Measures

Goal Areas

Overarching Theme – Deliver a quality transportation system to support the economy and lifestyles of current and future Pennsylvanians.

Goal Areas
1. System Preservation
2. Safety
3. Personal and Freight Mobility
4. Stewardship
Goal: System Preservation

Preserve transportation assets using sound asset management practices within the limitations of available resources.

Final Draft Objectives:

- Optimize pavement conditions
- Reduce the number of structurally deficient bridges
- Encourage state-of-good repair initiatives for all modes
- Limit the number of load restricted bridges

Draft Plan Performance Measures:

- Percent of pavements in excellent, good, fair, and poor condition
- Pavement structure index
- Percent of structurally deficient bridges (by deck area)
- Number of “weak bridges” and load restricted bridges
- Average life of bus fleet (as a % of design life)

Goal: Safety

Improve statewide safety for all modes and all users.

Final Draft Objectives:

- Reduce statewide transportation system fatalities
- Reduce serious injury crashes statewide
- Invest in cost-beneficial approaches and technologies that enhance the safety of the transportation system and improve public understanding of high-risk traveling behaviors
- Reduce crashes, injuries, fatalities in work zone areas
- Promote, develop, and sustain multijurisdictional traffic incident management programs to achieve enhanced responder safety and safe and quick traffic incident clearance

Draft Plan Performance Measures:

- Number of fatalities and serious injuries
- Number of fatalities and serious injuries in work zones
- Number of roadway-related bicycle and pedestrian fatalities and serious injuries
- Number of rail-crossing fatalities, serious injuries and incidents
Goal: Personal and Freight Mobility
Expand and improve system mobility and integrate modal connections.

Final Draft Objectives:
✓ Improve system efficiency, trip predictability, and eliminate bottlenecks by providing modal infrastructure and technological advancements.
✓ Increase access to jobs/labor/transportation choices in urban, suburban, and rural communities
✓ Support local communities through appropriate and equitable transportation modal options and investments
✓ Enhance multimodal access, with a focus on seniors, persons with disabilities and other disadvantaged populations.
✓ Improve first and last mile intermodal access and connections
✓ Support pedestrian and bicycle facility development
✓ Improve bridge underclearances and intersection geometry

Draft Plan Performance Measures:
• Annual hours of truck/auto delays (cost of delays)
• Annual transit ridership
• Percent/number of freight bottlenecks eliminated

Goal: Stewardship
Increase efficiency through modernization of assets and streamlining of processes

Final Draft Objectives:
✓ Ensure a high standard of quality and maximize effectiveness of agency and user investments
✓ Enhance the performance of the transportation system while protecting the state’s natural, cultural, and historic resources
✓ Encourage the development and use of innovative technologies
✓ Support transportation investments to reflect the diversity of Pennsylvanians and their needs
✓ Support coordination of land use and transportation planning
✓ Support economic development
✓ Support technical assistance/training courses offered to municipalities
✓ Support the creation of safe and attractive walking/cycling environments in destination centers
✓ Support clean air initiatives
✓ Promote initiatives aimed at improving system operations and energy efficiency

Draft Plan Performance Measures:
• Annual savings through PennDOT Next Generation implementation
• Timely delivery of approved local projects
• Timely delivery of HOP permits
Comprehensive Freight Movement Plan

Why do a freight plan?

- Freight shares Pennsylvania’s transportation infrastructure with passengers
  - As stewards of the system – we are responsible for accommodating all users

- Freight
  - Supports the economy of the region and state
    - Supports manufacturing
    - Provides jobs
    - Is the economy in motion
  - Impacts public and private infrastructure
Comprehensive Freight Movement Plan

- Pennsylvania’s FIRST Freight Plan
  - Integrated with LRTP
- Focus
  - Economic development
  - Improve freight efficiency
- Initiated prior to, yet will meet MAP-21 Guidance
  - Qualify for incentives
  - Projects identified and prioritized
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ATRI Data – Harrisburg After 5 Days

ATRI Motor Carrier Survey

What issues could be addressed to improve freight mobility?

- Infrastructure
- Congestion
- Tolls
- Insufficient Truck Routes
- Other
- Enforcement Issues
- Lack of Parking
- Construction
- Permitting Issues
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Dairy Farm Products – Exports (2011)

Dairy Farm Products - Exports by Value (2011$), 2011

Draft Modal Needs

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Modal Needs Background Overview

- State Transportation Advisory Committee
  - State Needs at $3.5 billion (May 2010)
  - County and Municipal Needs at $2.2 billion (December 2011)

Modal Needs Outline

- Highway and Bridge
- Public Transportation
- Rail Freight
- Passenger Rail
- Bicycle and Pedestrian
- Ports
Highway Needs Identification

• Needs will include the entire system:

<table>
<thead>
<tr>
<th>System</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal-Aid Eligible Highways</td>
<td>28,113</td>
</tr>
<tr>
<td>Other PennDOT roadways</td>
<td>11,679</td>
</tr>
<tr>
<td>Other State Agencies</td>
<td>1,366</td>
</tr>
<tr>
<td>State Maintained Roads</td>
<td>41,158</td>
</tr>
<tr>
<td>Non PennDOT Roadways</td>
<td>78,612</td>
</tr>
<tr>
<td>All Public Roadways</td>
<td>119,770</td>
</tr>
</tbody>
</table>

• Data: PennDOT data sets (HPMS; RMS)
• Tools: HERS-ST; TAM needs
• Needs: work in progress

Bridge Needs Identification

• Needs will include the entire system
  – State-maintained system is approximately 25,000 bridges
  – Locally-maintained system is approximately 7,000 bridges
  – Bridge is defined as a structure greater than 8 feet in length

• Data: national and state data sets (NBI; BMS)
• Tools: NBIAS; TAM needs
  – Interstate (preliminary, unconstrained, cumulative)
    • 2040: $8.13 billion
  – Non-Interstate
    • Work in progress
Appurtenances Needs Identification

- Needs for other infrastructure assets:
  - Culverts (tbd)
  - Tunnels ($340M)
  - Retaining Walls ($408M)
  - Signals ($8.5B)
  - Signs ($534M)
  - ITS ($2.2B)
  - Guiderails ($1.2B)
- Source: TFAC Report
- Tools: sketch planning tools

Public Transportation Needs Identification

- Needs include capital and operating expenses for urban, rural, and shared ride providers
- Source: TAC, TFAC reports
- Tools: Agency coordination
- Needs: 2040: $4.96 billion
Rail Freight Class I Railroad Needs Identification

- Needs include all four Class 1 railroads (e.g., CN, CPR, CSX, NS, etc.)
- Source: Intercity Passenger Rail and Rail Freight System Plan for 2035
- Tools: Agency coordination
- Needs: 2040: $1.5 billion
  - Network efficiency improvements
  - Improved terminals or facilities
  - Line upgrade needs
  - Safety enhancement improvements

Rail Freight Class II and III Railroad Needs

- Needs include all Class II and III railroads (e.g., regional, short lines)
- Source: Intercity Passenger Rail and Rail Freight System Plan for 2035
- Tools: Agency coordination
- Needs: 2040: $315 million
  - Rail Line Upgrade and/or Rehabilitation
  - Terminal or Yard Construction/Expansion
  - Safety Enhancement Improvements
  - Green Locomotive Retrofit
**Rail Freight Public Agency and Private Industry Needs Identification**

- Needs include industrial sites/private industry
- Source: Intercity Passenger Rail and Rail Freight System Plan for 2035
- Tools: Agency coordination
- Needs: 2040: $91 million
  - Public agency capital needs (port authorities)
  - Private industry needs (rail-served industries/businesses)

**Passenger Rail Needs Identification**

Needs include Amtrak’s *Keystone* and *Pennsylvanian* service

Source: Amtrak website; PennDOT coordination

Needs: 2040: $463 million
- Station improvements - $242.1 million
- Interlockings - $220.0 million
- Operating assistance - $15 million
Bicycle/Pedestrian Needs Identification

- Needs include ADA curb ramps; education/guidance/publications; incorporating bike/ped improvements in highway design, etc.
- Source: Survey of MPOs/RPOs/districts, planning partners, Philadelphia/Pittsburgh
  - “How much funding do you need on an annual basis to support the development of pedestrian and bicycle programs and facilities?”
- Needs: 2040: $405 million
  - Includes funded and unfunded projects

Baseline Revenue and Projections
2040 Baseline Revenue Forecast

- Provides an estimate of federal and state revenues expected to be available for capital improvements to 2040
- No new revenue included in estimate
- Projection of baseline revenues by mode
  - Highway
  - Bridge
  - Transit
  - Rail
  - Aviation
- Based on business as usual, conservative estimating
- Used to compare against modal needs estimates to identify likely funding gap
- Converted to “real” dollars to account for inflation

2040 Baseline Revenue Forecast (cont’d.)

- 2040 BASELINE REVENUE FORECAST: $104 Billion versus $70.3 Billion
- 32% Reduction in Buying Power
Project Prioritization Process

Project Prioritization Framework

- Introducing the Multimodal Economic Competitiveness Network
  - Step 1: Determine Pennsylvania’s economic drivers
  - Step 2: Define the transportation network
  - Step 3: Identify screening filters
  - Step 4: Identify goals and measures
  - Step 5: Apply economic benefit factors
  - Step 6: Apply scoring and weighting process
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Project Prioritization Framework
Multimodal Economic Competitiveness Network

- Critical multimodal transportation corridors and facilities connecting major economic drivers and regions to centers of commerce in PA and national and global markets
- Network includes interstate highways, major highway facilities, intermodal, freight rail, public transit, airports, and ports
- Failure within this network would have serious impacts on movement of goods and people, state’s economy, and jobs

Project Prioritization Framework
Multimodal Economic Competitiveness Network

Step 1: Identify Economic Drivers
- Cities with largest population in 10 PREP regions
- Major regional tourist destinations
- Commodity network for top agricultural products by market value
- Primary highway and freight rail corridors connecting oil and gas production to strategic destination points
- Concentrations of targeted industries by employment
- Concentrations of manufacturing exports
Project Prioritization Process
Multimodal Economic Competitiveness Network

Step 2: Defining the Multimodal Economic Competitiveness Network
- Network designation criteria for each mode
  - Highways
  - Airports
  - Intermodal Facilities
  - Public Transit
  - Ports and Waterways
  - Freight Rail

Project Prioritization Process
Multimodal Economic Competitiveness Network

Step 3: Project Screening Filters
- Must be on designated MEC network or provide best connection to node or intermodal facility that is part of MEC
- Eligible for federal or state funding or public-private partnership
- Supports LRTP/CFMP goals
- Project listed in LRTP, CFMP, state modal plans, or MPO or RPO LRTP
- Projects of statewide significance or multi-regional importance nominated by PennDOT
**Project Prioritization Process**
**Multimodal Economic Competitiveness Network**

Step 4: Linking Goals and Measures
- Developing measures for modes

Step 5: Apply Economic Benefit Factors
- Projects scored on technical merit initially
- Propose use of economic benefits factor for projects
- Additional evaluation on certain modal projects using cross-modal quantitative measure
- Process will be vetted with PennDOT and planning partners before implementation

Step 6: Final Scoring and Weighting Process

**Alternative Investment Scenarios**
Alternative Investment Scenarios

- Goal = cohesive investment strategy
- Investment Scenarios combine essential elements
  - Goals & objectives
  - Needs
  - Funding
  - Priorities
- Alternative Investment Scenarios – aligned with TFAC
  - Based on available funding
  - Menu of strategic investment choices
  - Different emphasis (e.g., system preservation, etc.)
  - Portray alternatives/explain outcomes
  - Understand consequences

Illustrative Examples

- **Scenario 1**: Preservation
  - Focus on existing system: all modes maintained at a high level of reliability; raise preservation and reliability performance for all modes
- **Scenario 2**: Emphasis on MEC Network
  - Emphasis on strategic assets and services...the Multimodal Economic Competitiveness Network
  - Well maintained, congestion addressed, high access maintained to key areas and within cities
- **Scenario 3**: Serve the Economic Drivers
  - Investments to spur business attraction and retention
  - Ports, distribution facilities, airports, leisure destinations, and transit connections to these drivers
Illustrative Examples (cont’d.)

• **Scenario 4**: Multi-modal System Expansion
  – Maintain and expand highway, transit, rail and non-motorized system linking cities and towns
• **Scenario 5**: Balanced Distribution
  – Spread dollars across existing functional elements and across expansion, preservation and modernization

Schedule – Key Milestones

• Spring 2013 - Goals and Objectives
• Summer 2013 - Performance Measures
• Fall 2013 - Multimodal Needs
• Fall 2013 - Revenue/Funding
• November 14 - Webinar #4
• December 10 - Executive Committee Meeting
• Winter 2014 - Alternative Investment Scenarios
• Spring 2014 - Project Prioritization
• Spring 2014 - Draft LRTP and Comprehensive Freight Plan
• Summer 2014 - Final LRTP and Comprehensive Freight Plan
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Ongoing Involvement

• [www.PAOnTrack.com](http://www.PAOnTrack.com)

• Project Webinar #4: “Project Prioritization” – Thursday, November 14, 1:00 to 3:00 p.m.

• Brian Wall, PennDOT  
  – (717) 772-0827; [bwall@pa.gov](mailto:bwall@pa.gov)

• Erin Dean, P.E., AICP, CDM Smith  
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Questions and Comments

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