Smart Transportation
In Pennsylvania and Beyond

by Allen D. Biehler

National Conference of State Legislatures

August 7, 2012
Pennsylvania’s Highway System

40,000 Miles state highways

76,000 Miles local roads
Pennsylvania’s Transit Systems

- 20 Urban Systems
- 16 Rural Systems
- 59 Shared Ride Systems
Pennsylvania’s
Land Development (1990-00)

3% growth in population

54% increase in developed land

Credit: Joel Cayford
Pennsylvania’s Traffic Growth

48% increase

Vehicle Miles Traveled

Year


All Vehicles
A Daunting
Repair Backlog
Structurally Deficient Bridges
Transportation
Program Reassessment March 2004

26 Projects
5 Billion Dollars

STOP or re-evaluate
Capacity Adding Projects
as percentages of total program

- 2001-2004: 25%
- 2003-2006: 23%
- 2005-2008: 20%
- 2007-2010: 13%
- 2009-2012: 5%
- 2011-2014: 3.7%
Poor Roads
Repair Backlog

Miles

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000

Structurally Deficient Bridges

Year


Bridges

4400 5800 4800
PennDOT’s
Smart Transportation Journey
Smart Transportation Outreach

- DOT
- State agencies
- Municipalities
- State and local elected officials
- Developers
- Consultants
- Planners
- Engineers
- Community leaders
- Transit agencies
- Alternative transportation advocates
Suburban growth
Suburban growth
Suburban growth
Conventional Approach to transportation planning

More Lanes
More Roads
System Management
ITS

More Pavement
More Efficiency

More Cars

Conventional Approach
A full View of transportation options

Conventional Approach

Lateral Approach

More Lanes
More Roads
System Management
ITS

More Pavement
More Efficiency

Move People, Not Cars
Move Less People, Fewer Miles

Manage, Not “Solve”

Transit
Bicycling
Walking
HOV/HOT Lanes

Traffic Calming
Access, Not Mobility
Business Friendly
Streets as Centerpiece

Land Use
Road Network
Pricing
Telecommuting/E-Commerce

Lane Limits
Change Standards

More Cars

More Efficiency

System Management

More Pavement

More Lanes

More Roads
Daily Trips Compared

- From home to school
- From work to a restaurant
- Visiting a friend’s house
The Realization

We could **no longer afford** the conventional approach to tackling transportation issues.
Department
Focus Areas

- Infrastructure Preservation
- Safety
- Maximizing Technology to better manage transportation
- Linking Land Use and Transportation
What is Smart Transportation?

Smart Transportation is partnering to build great communities for future generations of Pennsylvanians by linking transportation investments, land use planning and decision-making.
Smart Transportation Themes

1. Money matters
2. Leverage and preserve existing investments
3. Choose projects with high value/price ratio
4. Safety always and maybe safety only
5. Look beyond level-of-service
6. Accommodate all modes of travel
7. Enhance local network
8. Build towns not sprawl
9. Understand the context; plan and design within the context
10. Develop local governments as strong land use partners
Money matters.
Accommodate All
modes of travel
Build Towns
NOT sprawl
Implementing Smart Transportation

1. Increasing **Partnership** Efforts
2. Changing the **Rules**
3. Changing the **Decision Making** Processes
Smart Transportation Guidebook

Planning and Designing Highways and Streets that Support Sustainable and Livable Communities

New Jersey Department of Transportation

Pennsylvania Department of Transportation
Using the guidebook

- Use **flexible design** on all projects
- Link land use and roadway design
- Understand the **design context**
- Design to a **desired** operating speed
- Increase **coordination** with municipalities
Smart Transportation

IN ACTION
US 202 section 700
Montgomeryville to Doylestown

Four Lane Freeway
$465 Million Dollars
In 2004, US 202 was planned as an expressway at a cost of $465 million.
US 202
Community Task Force
US 202
Cross Sections

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Smart Transportation IN ACTION

- From redesign to Construction in 3 years
- Community and stakeholder support
- Savings of $185 Million
US 202
Construction Progress

July 2012
Smart Transportation challenges

The Challenge
"We don’t understand what Smart Transportation is...."

What was done
Developed a Pilot Program.
Pennsylvania
Community Transportation Initiative

**Advance the practice** of Smart Transportation

- Land Use Connection
- Collaboration with Stakeholders
- Build Towns not Sprawl
- Readiness
- Innovative
- Consistency with Regional Plans
- Learning opportunity

credit: The Spencer Photography / Flickr
Pennsylvania
Community Transportation Initiative

- $60 million dollars over two years
- Received over 400 applications for over $600 million
Selected Projects

- Applications Selected: 50
- Funds for Selected Projects: $59,284,992
City of Altoona
pedbike trail

A 2.5 Mile Trail connecting the Penn State Altoona Campus to Downtown

credit: Dennis Wong / Flickr
Borough of Carlisle
multimodal transportation

Downtown Plan
Increased walkability
Connection to multi-use trails
Enhanced Safety and Mobility

credit: Doug Kerr / Flickr
Lessons Learned

- Land use is local, transportation is regional
- Partner with local governments
- Added capacity is not always the solution
Smart Transportation

Melding transportation and community design.

It takes a culture change  
... but is worth the effort.
Participating DOTs
But we’ve always done it this way
Intelligent Transportation Systems (ITS)
Streaming Video to the Public
Proactive Information to Motorists

- In-vehicle navigation systems
- Advanced smartphone applications
Active Traffic Management

Integrated corridor management
ITS in Other Sectors
Finding available parking
Crowdsourcing Transit Information

Edward G. Rendell, Governor
Real Time Transit Information
## Adaptive Traffic Signals

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<th>Travel Time</th>
<th>Speed</th>
<th># of Stops</th>
<th>Wait Time</th>
<th>Emissions</th>
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<tr>
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<td>30%</td>
<td>34%</td>
<td>29%</td>
<td>48%</td>
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<tr>
<td>Mid Day</td>
<td>33%</td>
<td>49%</td>
<td>53%</td>
<td>50%</td>
<td>29%</td>
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<tr>
<td>PM rush</td>
<td>23%</td>
<td>27%</td>
<td>9%</td>
<td>36%</td>
<td>18%</td>
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<tr>
<td>Evening</td>
<td>18%</td>
<td>28%</td>
<td>35%</td>
<td>28%</td>
<td>14%</td>
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<tr>
<td><strong>Overall</strong></td>
<td><strong>26%</strong></td>
<td><strong>34%</strong></td>
<td><strong>31%</strong></td>
<td><strong>41%</strong></td>
<td><strong>21%</strong></td>
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July 2012

Research sponsor: The Heinz Endowments
Connected Vehicle Technology
Virtual Traffic Signals

Main Concept

Principle of Operation

- a) Vehicle A
- b) Elected Leader
- c) Leader
- d) New Leader
Connected Vehicle

Over 2800 vehicles

University of Michigan Transportation Research Institute
Volvo’s Road Train
Autonomous Driving

Winner Urban Challenge 2007

2012 GM Lab

Carnegie Mellon
Doing everyday tasks.....

........exceptionally well.