SUSTAINABLE STATE TRANSPORTATION FUNDING AND SPENDING

Thursday, April 24, 2014
National Conference of State Legislatures
For audio, use your computer’s audio or phone 646-307-1705 and enter the access code in your confirmation e-mail
Welcome to the NCSL NRI Committee 2014 Spring Webinar Series!

A Question of Equity: Net Metering and the Costs and Benefits of Rooftop Solar
Thursday, May 1, 2014

Implementing the 2014 Farm Bill: What it Means for States
May 2014 (TBD)

The Rise of Renewables: Integration Challenges and Opportunities
Thursday, May 29, 2014

The State's Place in Federal Toxic Chemical Reform
June 2014 (TBD)

Increasing Natural Gas Pipeline Safety
June 2014 (TBD)

All webinars at 3 ET (2 CT / 1 MT / noon PT)

Check out http://www.ncsl.org/default.aspx?tabid=28045 for more information
Today’s Moderator and Presenters

**Moderator**
Douglas Shinkle, NCSL

**Presenter**
Jaime Rall, NCSL

**Presenter**
Eric Sundquist, SSTI
U.S. Travel Trends are Changing…

Less Driving
Mode Share
Demographic Shifts
Sharing Economy
Alternative Fuels

...So State Transportation Funding and Spending Approaches are Changing, Too!
States Leading the Way:
The Quest for Sustainable Transportation Funding

NCSL Webinar
April 24, 2014
Jaime Rall, Program Manager, NCSL Transportation Program
Transportation Funding Crisis

• Chronic funding gaps
• Years of underinvestment
• Aging infrastructure
• Growing transportation demand
• Declining gas tax revenues
• Political reluctance to raise gas tax
• National recession
• State budget shortfalls
• Uncertainty of federal program
States provide about half of all funding for roads, bridges, rail and transit—compared to the federal contribution of about 20 percent.
Gasoline Tax Rates

As of April 2014, state gas tax rates ranged from $0.08 in Alaska* to about $0.53 in California.

Nationwide, the average state gas tax was 31.49 cents per gallon.

* Plus local sales taxes for cities and boroughs

Source: American Petroleum Institute, 2014.
As of April 2014, 16 states had not raised gas taxes in more than 20 years.

No state legislatively increased its gas tax in 2010, 2011 or 2012.

As of 2011, state gas taxes had fallen by a combined $10 billion each year since last raised.

Often small increases had lagged behind funding needs.

Transportation Funding Crisis

- Chronic funding gaps
- Years of underinvestment
- Aging infrastructure
- Growing transportation demand
- Declining gas tax revenues
- Political reluctance to raise gas tax
- National recession
- State budget shortfalls
- Uncertainty of federal program
The Value of the Federal Gas Tax is Also Falling
For the Same Reasons as (Most) State Gas Taxes

EXHIBIT 2-9: FEDERAL GASOLINE TAX RATE AND LOSS IN PURCHASING POWER

Transportation Faces Its Own Fiscal Cliff

- The current federal surface transportation law (MAP-21) expires on Sept. 30, 2014
- The highway account of the federal Highway Trust Fund is predicted to reach insolvency before then
- Legislators express skepticism about future help from the federal government
According to the ASCE, in 2010, deteriorating surface transportation infrastructure cost U.S. households and businesses nearly $130 billion in vehicle operating, safety and environmental costs and time delays.

If current trends continue, these costs will grow exponentially and accumulate in coming years.
The Question States are Asking

- NCSL recognizes that the federal government plays a vital role and that the federal program should be continued and preserved ...

- ... at the same time, the key question has been: How can states provide needed transportation infrastructure in a time of uncertainty ... with or without long-term, sustainable federal programs?
Transportation Infrastructure is a Top Issue Across State Legislatures

- In 2013, at least 435 relevant bills were considered in 47 states and D.C.
- In 2014 (so far!), at least 293 relevant bills have been considered in 38 states and D.C.
Options on the Table

• Funding
• Financing
• Efficiency, accountability and revenue-protection
Recent State Transportation Funding Proposals

Over the past few years, legislatures have looked at various options for transportation funding, from the traditional to the unprecedented ...
Three Trends as States Seek Sustainable Transportation Funding

- Tracking with the economy
- Capturing all users
- Authorizing local options
Trend 1: Tracking with the Economy

WY HB 69 (the only simple gas tax increase in 2013)

VT HB 510

MA HB 3535

MD HB 1515

VA HB 2313

DC B 199

PA HB 1060
15 States and D.C. Now Have Variable-Rate Gas Taxes
Will States Lead the Way on Gas Taxes?

Senate EPW Chair Barbara Boxer (D-CA) has suggested the federal government “follow the lead of some of our states” with a percentage-based gas tax.
Is Raising Gas Taxes Enough?

• “Even without alternative fuel vehicles, the fuel tax won’t keep pace and the system just won’t work.”
  
  *Sen. Bruce Starr, Ore.*

• “With higher efficiency standards and alternative fuel vehicles, government cannot continue to rely on the gas tax as a revenue source.”
  
  *Speaker Bill Howell, Va.*

• “The gas tax will always play a role in funding our transportation system, but eventually we will have to look at more stable sources as well.”
  
Trend 2: Capturing All Users

• Fees for alternative fuel vehicles or electric vehicles
• Taxes on alternative fuels
• Mileage-based user fees (also known as Vehicle Miles Traveled or VMT fees)
Per-Mile Fees: Pilot Projects

As of 2012, at least 18 states had undertaken VMT pilot projects.

Weight-Distance Taxes

Four states tax heavy vehicles based on miles traveled and vehicle weight.

At least 51 VMT-related bills have been introduced in 18 states since 2008.

Trend 3: Authorizing Local Options

In the past few years, a number of states have expanded local authority to:

• Issue bonds
• Assess local option taxes or fees
• Have more spending flexibility
The “Laboratories of Democracy”

• State gas taxes preceded federal gas tax by 13 years

• States can also lead the way to explore revenue options and alternatives for the future
Contact Details and Resources

Jaime Rall
NCSL Transportation Program
Direct line: 303-856-1417
jaime.rall@ncsl.org

For details about specific state bills, see NCSL's online, searchable Transportation Funding and Finance Legislation Database:
http://www.ncsl.org/default.aspx?TabId=25720

NCSL is always seeking public and private funding partners for collaborative research and outreach initiatives that serve the needs of state legislatures.

Besides no-cost technical assistance to state legislative entities upon invitation, we also provide responses to individual requests for information.

Please contact us if you're interested.
Sustainable spending at the state DOT

Eric Sundquist, SSTI
April 24, 2014
Victims of competing technology and/or obsolete business models:

- Canals
- Railroads
- Transit
- Highways
“We didn’t undergo fundamental change by our own choice. It was forced on us. The wisest of people or institutions seldom can deduce, on their own, that change is needed. And if they do, they never muster the courage to act on that need.”

*Robert Lutz, former senior executive, General Motors*

*(HT Jack Lettiere, former NJ DOT commissioner)*
Moving toward a new business model

FHWA, Census Bureau

4/24/2014
Sustainable spending
Moving toward a new business model

SSTI
Moving toward a new business model
Asset management
Life-cycle cost accounting

### PennDOT LIFE CYCLE COST ANALYSIS SPREADSHEET (Version 5.0)

#### Project Description:

<table>
<thead>
<tr>
<th>PAVEMENT TYPE</th>
<th>TREATMENT</th>
<th>PAVEMENT LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bituminous</td>
<td>A New Construction or Reconstruction</td>
<td>50 Years</td>
</tr>
<tr>
<td>2 Concrete</td>
<td>B Reconstruction on Rubblized Concrete</td>
<td>50 Years</td>
</tr>
<tr>
<td></td>
<td>C Unbonded Concrete Overlay</td>
<td>50 Years</td>
</tr>
<tr>
<td></td>
<td>D Bonded Concrete Overlay</td>
<td>30 Years</td>
</tr>
<tr>
<td></td>
<td>E Concrete Pavement Rehabilitation &amp; Bituminous Overlay</td>
<td>30 Years</td>
</tr>
<tr>
<td></td>
<td>F Bituminous Overlay on Bituminous Pavement</td>
<td>10 Years</td>
</tr>
<tr>
<td></td>
<td>G Ultrathin Whitetopping on Bituminous Pavements</td>
<td>10 Years</td>
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</table>

<table>
<thead>
<tr>
<th>ALT #</th>
<th>TYPE</th>
<th>TREATMENT</th>
<th>PAVEMENT DESCRIPTION</th>
<th>PAVEMENT LIFE</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<td>3</td>
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<td>4</td>
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</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discount Rate (5-year average of annual 30-Year Real Interest Rate, OMB Circular) = 

Asphalt Adjustment Multiplier (AAM) = 

Current Construction Cost Index =

#### STEP 1: QUANTITY CALCULATIONS

1.1. Length in One Direction = FT
1.2. Is Roadway Divided? = Y/N
1.3. Length of Construction = 0 FT
1.4. Number of Lanes in Both Directions = 
1.5. Lane Width = FT
1.6. Total Pavement Width = 0.0 FT
1.7. Left Shoulder Width =
Sustainable spending

Energy Conservation Score Card

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2012</th>
<th>Since Inception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Savings (kWh)</td>
<td>1,393,975</td>
<td>4,474,177</td>
<td>8,762,085</td>
</tr>
<tr>
<td>Power Savings (kW)</td>
<td>231</td>
<td>746</td>
<td>1,412</td>
</tr>
<tr>
<td>Energy Cost Savings</td>
<td>$213,244</td>
<td>$589,035</td>
<td>$1,147,248</td>
</tr>
<tr>
<td>Avoided Project Cost</td>
<td>$286,271</td>
<td>$1,769,233</td>
<td>$2,737,733</td>
</tr>
<tr>
<td>Average Payback Period</td>
<td>2.29</td>
<td>0.40</td>
<td>0.91</td>
</tr>
<tr>
<td>Pollutant Offsets (in LBS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO2</td>
<td>1,015,585</td>
<td>3,259,035</td>
<td>6,582,990</td>
</tr>
<tr>
<td>CH4</td>
<td>105</td>
<td>339</td>
<td>663</td>
</tr>
<tr>
<td>NOx</td>
<td>731</td>
<td>2,345</td>
<td>4,593</td>
</tr>
</tbody>
</table>

Environmental Equivalents

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2012</th>
<th>Since Inception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallons of Gasoline</td>
<td>110,261</td>
<td>353,900</td>
<td>693,066</td>
</tr>
<tr>
<td>Households*</td>
<td>129</td>
<td>414</td>
<td>811</td>
</tr>
</tbody>
</table>

Project by Property Type

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking Gar.</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking Lot</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Station</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
*Households - average annual electrical usage of Massachusetts household
“Fix-it-first” and right-sizing

I-69 on hold in Tennessee
By Richard Locker
Posted December 24, 2012 at 3:56 p.m.

NASHVILLE — After two decades of planning, design and some land acquisition, the Tennessee segment of proposed interstate 69 from Memphis north to South Fulton on the Kentucky border has been quietly put on hold by state officials.

They say the project would divert too much of Tennessee’s annual highway budget into a single project and that it won’t proceed until the federal government dedicates more money to the project.

It was promoted as a catalyst for economic development in a region with high poverty rates, a safer, faster route for motorists between Indianapolis and Texas, and another

4/24/2014 Sustainable spending 39
“Fix-it-first” and right-sizing

The share of PennDOT’s capital spending devoted to new-capacity projects has fallen sharply since 2004.

PennDOT
“Fix-it-first” and right-sizing

MoDOT
“Big data”

**Operational Efficiency**
- Increase level of transparency
- Optimize resource consumption
- Improve process quality and performance

**Customer Experience**
- Increase customer loyalty and retention
- Perform precise customer segmentation and targeting
- Optimize customer interaction and service

**New Business Models**
- Expanding revenue streams from existing products
- Creating new revenue streams from entirely new (data) products

DHL
Efficiency and customer experience

Classical prediction
63% forecasting deviation
> +/- 20%

Neuro Bayes®
11% forecasting deviation
> +/- 20%

DHL
Inefficiency, poor customer experience
New business models

Crowd-based Pickup and Delivery
A large crowd of occasionally available carriers pick up or deliver shipments along routes they would take anyway

Location, destination, availability

DHL
Pipes, wires and travelways
The origin-destination question

- Often ignored entirely.
- Sometimes modeled with expensive, partial, sporadically collected data.
  - Surveys do not capture through travel.
  - Surveys do not capture freight or other commercial travel.
- Almost never directly observed.
- Instead, we look at volume and speed in the pipes – a poor substitute.
Transportation as pipes

<table>
<thead>
<tr>
<th>City</th>
<th>Travel Time Index</th>
<th>Average Travel Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>1.35</td>
<td>57.4 minutes</td>
</tr>
<tr>
<td>Chicago</td>
<td>1.43</td>
<td>35.6 minutes</td>
</tr>
</tbody>
</table>

Extra rush hour delay

Atlanta: 14.8 mins
Chicago: 10.7 mins

Travel time without traffic

Atlanta: 42.5 mins
Chicago: 24.9 mins

Though Atlanta has a much lower (better) Travel Time Index (TTI), Chicago commuters spend 20 minutes less per peak period trip.

T4A
Big data and origin-destination

In the past, organizations could only make internal use of location and usage data from mobile networks. This is because of privacy laws that limit the exploitation of individual subscriber information. But once subscriber identity has been split from the movement data, substantial business value remains in this anonymous crowd data, as Telefonica has discovered.

DHL, AirSage
Moore County, N.C.
## Moore County, N.C.

<table>
<thead>
<tr>
<th>Location</th>
<th>Internal-external</th>
<th>Internal</th>
<th>Through</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 1 between Cameron and Vass</td>
<td>10,809</td>
<td>607</td>
<td>1,204</td>
<td>12,620</td>
</tr>
<tr>
<td>US 1 North of May Street split</td>
<td>14,450</td>
<td>9,856</td>
<td>3,388</td>
<td>27,694</td>
</tr>
<tr>
<td>US 1 North of Morganton Road</td>
<td>7,262</td>
<td>11,797</td>
<td>3,233</td>
<td>22,293</td>
</tr>
<tr>
<td>US 1 South of 211/15-501 merge</td>
<td>10,524</td>
<td>7,307</td>
<td>2,358</td>
<td>20,189</td>
</tr>
<tr>
<td>US 1 at Aberdeen</td>
<td>15,279</td>
<td>8,402</td>
<td>3,860</td>
<td>27,541</td>
</tr>
<tr>
<td>US 1 North of Pine Bluff</td>
<td>8,123</td>
<td>3,970</td>
<td>3,115</td>
<td>15,208</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>11,075</strong></td>
<td><strong>6,990</strong></td>
<td><strong>2,860</strong></td>
<td><strong>20,924</strong></td>
</tr>
<tr>
<td><strong>Share of traffic</strong></td>
<td><strong>52.9%</strong></td>
<td><strong>33.4%</strong></td>
<td><strong>13.7%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

AirSage
Not all traffic is local, but most is
Not all traffic is local, but most is
Bigger pipes or shorter routes?
Bigger pipes or different routes?

Current Routes
Clean sheet optimization to minimize opex, unmet demand and travel time
Constraints include fleet size, max transfers, duration, etc.
Optimal routes can
• reduce OPEX cost up to 40%
• reduce unmet demand by 37%
• reduce avg. travel time from 37 minute average to 10-22 minute average

Clean Sheet Optimal Routes
Eric Sundquist
Managing Director, SSTI
608-265-6155
erics@ssti.us
Questions?

Please type your questions into the chat box.
Archived Webinar

Slides and a recording of today's event will be made available within 5 business days at http://www.ncsl.org/default.aspx?tabid=28017

Questions or Comments?

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