Finding the Interstate in Uncertainty

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TRB – Committee for a Study of the Future Interstate Highway System
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Presentation Outline

FUTURE INTERSTATE HIGHWAY SYSTEM
"Conduct a study on the actions needed to upgrade and restore the Dwight D. Eisenhower National System of Interstate and Defense Highways to its role as a premier system that meets the growing and shifting demands of the 21st century”

• What we know....

• What we don’t know...

• Finding the path forward....
# What We Know....

**Interstate Condition is Struggling**

## Percent of travel (VMT) on Interstate Pavements with Good or Acceptable Ride Quality

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>2000</th>
<th>2002</th>
<th>2004</th>
<th>2006</th>
<th>2008</th>
<th>2010</th>
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</thead>
<tbody>
<tr>
<td>Rural Interstate</td>
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<tr>
<td>Percent Good Ride Quality</td>
<td>70%</td>
<td>72%</td>
<td>74%</td>
<td>79%</td>
<td>79%</td>
<td>79%</td>
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<tr>
<td>Percent Acceptable</td>
<td>97%</td>
<td>97%</td>
<td>98%</td>
<td>98%</td>
<td>97%</td>
<td>91%</td>
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<tr>
<td>Urban Interstate</td>
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<tr>
<td>Percent Good Ride Quality</td>
<td>44%</td>
<td>45%</td>
<td>49%</td>
<td>54%</td>
<td>56%</td>
<td>65%</td>
</tr>
<tr>
<td>Percent Acceptable</td>
<td>91%</td>
<td>90%</td>
<td>90%</td>
<td>93%</td>
<td>92%</td>
<td>90%</td>
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Source: Ross Crichton, Future Interstate Study Committee Meeting (Sept 2016)

## Percent of Structurally Deficient or Functionally Obsolete Interstate Bridges

<table>
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</thead>
<tbody>
<tr>
<td>Structurally Deficient</td>
<td>4.0%</td>
<td>4.1%</td>
<td>4.3%</td>
<td>4.3%</td>
<td>4.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Functionally Obsolete</td>
<td>13.2%</td>
<td>12.9%</td>
<td>12.8%</td>
<td>12.0%</td>
<td>11.8%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Total Deficient</td>
<td>17.2%</td>
<td>17.0%</td>
<td>17.1%</td>
<td>16.3%</td>
<td>16.3%</td>
<td>16.1%</td>
</tr>
</tbody>
</table>

| Urban Interstate Bridges | | | | | | |
|--------------------------| | | | | | |
| Structurally Deficient | 6.7% | 6.5% | 6.3% | 6.0% | 5.9% | 5.4% |
| Functionally Obsolete | 23.8% | 23.0% | 23.3% | 23.6% | 23.9% | 23.0% |
| Total Deficient | 30.5% | 29.5% | 29.6% | 29.6% | 29.8% | 28.4% |

Source: Brian Pallasch, Future Interstate Study Committee Meeting (Sept 2016)
What We Know....

Demand is Growing

2007

[Map Image]

2040

[Map Image]

Source: Michael Trentacoste, Future Interstate Study Committee Meeting (Sept 2016)
What We Know....

People are moving to megaregions

Source: James Garland (FHWA), AMPO Annual Conference (Oct 2016)
What We Know....

Transportation revenue is weakening

- Federal gas tax has not been raised since 1993 (and no political will to raise the gas tax)
- Inflation
- Vehicles are more fuel efficient
- Electric and hybrid cars are on the rise
- Drivers don’t know how much they are paying

Source: CH2M

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What We Know....
Automation is not a question of “if” but “when”

Connected Vehicles
Automated Driving Vehicles

Connected Travelers
Connected Infrastructure

Source: Presentation: Multimodal Intelligent Traffic Signal Systems by Dr. Larry Head, University of Arizona (June 2016)

Photo Source: http://www.its.dot.gov
What We Know....

Transportation is the heartbeat of our economy

16 States and the District of Columbia

- $4.7 trillion economy (40% of US GDP)
- 35% of nation’s VMT (21% of road miles)
- 5.3 billion tons of freight shipments annually
- 565 million long-distance (>100 miles) trips annually
- Corridor = third largest economy in world

Note: Data from 2008
“All I know is that I know nothing, .....and I'm not even sure about that.”

- Michel de Montaigne (1533-1592)

“It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.“

- Mark Twain (1835 – 1910)
A Rapidly Changing Environment

Just in the last few years:

- Smartphone ownership (by adults) in the US:
  - Increased from 35% in 2011 to 64% in 2015 (92% of adults now have a cell phone or smart phone)

- Tablet computer ownership (by adults) in the US:
  - Increased from 3% in 2010 to 45% in 2015

- In the Coalition region – from 2008 to 2014:
  - VMT has increased from 88.4 billion to 94.1 billion
  - Population has increased from 111 million to 118 million

- Vehicle Infrastructure Integration expanded and includes Connected and Automated Vehicles
Change Influencers

Robots that Teach Each Other...and Warehouse Robotics

Freight Volumes

Tesla Autopilot

Connected and Automated Vehicles

24/7 Ports, Off-Hour Deliveries

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What We Don’t Know....
How growth will really effect transportation

• 50 megaregions instead of 13?
• Importance of rural areas recently demonstrated

Source: Besty Mason, National Geographic (November 2016)

• Urban trucking grows 800% (2015)
  Source: Adie Tomer, Brookings Institute (July 2015)

• “Shifting to e-commerce actually reduced congestion” (2016)
  Source: Joe Cortright, City Observatory (Nov 2016)

Photo credit: Jason Lawrence, Flickr
What We Don’t Know….
How to get a reality check?

Source: www.cityam.com, 08 August 2015: “Meet the Gartner Hype Cycle for 2015: It’s all about self-driving cars and smart dust in emerging tech trends”

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Today
- 100 yr. old model
- No computer tech

Shared Mobility
- Human driven; mobility on-demand via software

Autopia
- Autonomous PODS
- On-demand public transport

Owned Autonomy
- Sensors, algorithms, mechatronics

Asset Owned
- x

Asset Shared
- y

Human Driven
- x

Autonomous
- y

Company Websites, Morgan Stanley Research
What We Don’t Know....
How fast innovation will be adopted?

New vehicle series with electronic stability control
by model year

Presentation: Assessing the Effectiveness of Crash Avoidance Features- the Building Blocks for an Intelligent Transportation System (David Zuby, Insurance Institute for Highway Safety)

Source: www.i95coalition.org
What We Don’t Know….
How fast innovation will be adopted?

Registered vehicles with electronic stability control
By calendar year

Presentation: Assessing the Effectiveness of Crash Avoidance Features - the Building Blocks for an Intelligent Transportation System (David Zuby, Insurance Institute for Highway Safety)

Source: www.i95coalition.org
What We Don’t Know....
What will derail adoption
What We Don’t Know....
Why can’t we get people to pay more for transportation?

Analysis source: Rich Perrin (former MPO Director in Rochester NY)
Finding the Interstate: How Define a Vision

- The Coalition’s Strategic Vision Built on Results from Nationally-Prominent and State/Regional Visioning Efforts

- Continuing a “Business as Usual” Approach to Transportation Will Lead to Dire Consequences
Finding the Interstate: How Define a Vision

Vision: Supporting Economic Growth in a Carbon-Constrained Environment

- Continuing Economic Growth
- Sustainable Environmental and Energy Policies
- Sustainable Land Use Practices
- Balanced Multimodal Transportation Systems
Vision: Supporting Economic Growth in a Carbon-Constrained Environment

- Increased vehicle fuel efficiency
- Increased use of alternative fuels
- Reduced rate of VMT growth
- Greater use of alternative modes
- Aggressive transportation system management
  - Including pricing and connected vehicles
- Additional highway capacity
  - Especially managed lanes
Finding the Interstate
Focus on the “why” we want the cool technology

Reduce and mitigate crashes

Expanded roadway capacity and enhanced traffic flow

More mobility options

Land use opportunities (eliminate parking)

Attract business to your state

This IS happening

Fuel efficiencies and reduced emissions

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Finding the Interstate
Willingness to adjust

Initial Strategic Plan:
Installation of roadway sensor system to gather data

Adjustment for New Technology:
Wireless data from vehicles
Finding the Interstate
Shift to an “optimizing” mentality

Evolution of the Federal Program

- Build
  - Project Oversight
- Expand
  - Process Review
- Manage
  - Outcome Performance
- Optimize
  - Maximize Existing System
- FAST ACT
  - MAP-21

Note: Graphic is an expansion of a figure used by Jeff Paniati’s opening remarks at the 2015 Transportation Systems Performance Measurement and Data Conference
Finding the Interstate: How Marketing, marketing, marketing
The I-95 Corridor Coalition: Multi-Modal ▬ Multi-Jurisdictional ▬ Multi-Disciplinary

Formed in 1993, the I-95 Corridor Coalition is a partnership of multi-state, multi-modal public agencies working together to accelerate transportation improvements.
The I-95 Corridor Coalition: Accelerating System Improvements

Easing funding uncertainties through increased revenue – i.e., tolling interoperability and violation reciprocity

Helping agencies to adopt tools to meet performance management requirements and to improve traffic movement – i.e., vehicle probe project suite and regional integrated transportation information system

Analyzing freight flows and bottlenecks to improve supply chain performance – i.e., regional rail and freight fluidity studies

Providing a low-risk environment to explore innovation and programs – i.e., mileage-based user fee research and pilot

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Key Takeaways

We do know a lot....

- Interstate condition is struggling
- Demand is growing
- People are moving to megaregions
- Transportation revenue is weakening
- Automation is not a question of “if” but “when”
- Transportation is the heartbeat of our economy

But we face many uncertainties......

- Rapidly changing environment with multiple “influencers”
- How will growth really effect transportation?
- How to get a reality check?
- What path will technology adoption follow?
- How fast will innovation be adopted? What will derail adoption?
- Why can’t we get people to pay more for transportation?

Finding the Interstate

- Define a vision
- Focus on “why” we want the cool technology
- Adopt a willingness to adjust
- Shift to an “optimizing” mentality
- Marketing, marketing, marketing
- Collaborating across agency boundaries
Contact Information

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“Make no little plans; they have no magic to stir men’s blood.”
Daniel Burnham, 1893