Transportation infrastructure scenarios, needs and opportunities
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Sponsor & objectives

• Sponsor: Association of Equipment Manufacturers
  - 800+ firms that make construction, agricultural, mining, utility equipment, & component parts.

• Objectives:
  - Explore transportation infrastructure needs in 2050.
    - Target: Improve supply chain efficiency for US manufacturing.
    - Target: Market opportunities for equipment manufacturers.
    - Not just build – get most from existing infrastructure, address funding, policy & decision making.
  - Provide independent basis for advocacy by AEM.
  - Prepare a view of the future of transportation infrastructure that has broad relevance.
Approach & our team

• Approach:
  ▪ Define framing scenarios
  ▪ Independent white papers
  ▪ Review of public, private infrastructure condition & performance
  ▪ Four team workshops
  ▪ Produce integrated product

• NU-TC Multi-disciplinary team:
  ▪ Fabian Bustamante – EECS
  ▪ Sunil Chopra – KSM
  ▪ Kimberly Gray – CEE
  ▪ Michael Hewitt – Loyola Business
  ▪ Hani Mahmassani – TC/CEE
  ▪ Ian Savage – Economics
  ▪ Joseph Schofer – CEE
Starting point: Transportation infrastructure malaise

- No national transportation policy.
- No sustainable funding strategy.
- Weak public policy role in intermodal coordination and service planning.
- Gradual devolution of federal transportation role to states.
- Inconsistent support for transportation infrastructure across states and provinces.
  - Only 24 states have increased funding to address highway and transit needs in past decade.

Consequences

- Funding gaps, deteriorating infrastructure, increasing congestion, decreased resilience, wasted time, energy, money and lives.
- Growing infrastructure deficit is brake on economic development and international competitiveness.
- Modest engagement of private interests in transportation finance, but this fails to solve funding problem.
Scenario 1: Static policy in a changing world - more of the same

- *Businesses as usual* transportation strategy: funding & policy vacuum accelerates downward trend in public investment.

- Infrastructure failures are more frequent, key infrastructure becomes less resilient, increasing losses due to natural and man-made disruptions.

- Private investment fills gaps for busiest links and nodes, supported by tolls.

- Logistics efficiency declines, taking competitiveness with it.
Scenario 2: Resilient and sustainable communities

- Changing values, rising energy costs, severe weather disruptions, & pressures for resource conservation lead to adoption of sustainability goals & policies.
- Systematic deployment of technologies that support a sustainable economy.
- Incentives for more compact development, more efficiency living, and reduced dependency on motorized travel.
- Automation leads to productive recovery of time spent traveling; more high speed rail, electrified, high speed, automated trucks.
Scenario 3: Competitive success

- Sustainability goals take back seat to economic expansion.
- Advances in connected, multichannel, footloose, automated transportation systems, create the connected, dispersed city.
- Big infrastructure investments, supported by network-scale road pricing, & technology advances boost logistics efficiency, competitiveness.
- Manufacturing returns to North America, markets are global, leading to investments to improve ports, harbors, land gateways.
- Increased international trade, growing long distance freight flows, and dispersed population, supported by high speed surface transportation and broadband connections.
- Weather disruptions increase, are anticipated & managed with infrastructure, backed up by high speed wireless connectivity, allowing much work to go on despite travel interruptions.
Transportation as driver of the future

• Transportation infrastructure is fundamentally an enabler, that facilitates achievement of economic, social, environmental, and strategic goals.

• But strategic infrastructure investments can do more than simply encouraging or sustaining a particular future; they can to help achieve a preferred future.

• What future do we want?
Obstacles to sufficient infrastructure funding

• Failure to understand how we pay for infrastructure
  ▪ Taxes or user fees?
  ▪ Disconnect in the funding-investment loop: who pays to fill potholes?
• Mistrust in government
  ▪ Poor projects.
  ▪ Corruption.
• Belief that others will/should pay
  ▪ Myth of the PPP.
    • Tolls, availability payments and the effect on user costs
  ▪ Loans for next generation to repay.
• Ideological resistance
  ▪ Lacking alternative ways to sustain infrastructure.
• **User fees and taxes**
  - Highways, the MFT trust fund, frozen in time, costs rising, consumption flat to falling.
    - State actions fill gaps – 16 last five years
  - Inland waterways – getting it half right.
    - Political influence, limited funds, industry open to exchanging fees for better service
  - Airports and airways – fees from passengers, shippers and airlines.

• **Investment vs. Spending**

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**General fund transfers to Highway Trust Fund**

- $7 b 2009
- $2.4 b 2012
- $11.7 b 2014
- $8 b 2008
- $19.5 b 2010
- $5.9 b 2013

**Federal transportation authorization bills**

- ISTEA 1991-1997
- TEA-21 1998-2004
- SAFETEA-LU 2005-2011
- MAP-21 2012-2015

Extended 10 times
5-month Extension
Funding transportation infrastructure – private sector

- **Railroads**
  - Private sector transportation companies spend money to make money.
  - Private carriers “get” the connection between infrastructure, performance, revenues, and profitability.
  - Post deregulation (1980), RRs spent $575 billion on infrastructure and maintenance.
  - Government role.
    - Loan guarantees (TIFIA, TIGER)

- **Pipelines**
  - Invest in response to market opportunities.
  - Regulatory barriers.
A path forward - prescription for the future

• Need more infrastructure? Need **better** transportation infrastructure.
  ▪ Despite technology advances, it’s a long way to 2050 - Need for basic transportation infrastructure won’t evaporate.

• Priorities
  ▪ Sufficient, sustaining, equitable funding source.
  ▪ Smart, informed, transparent data drive decision making.
  ▪ Maintain, restore, rehabilitate, break bottlenecks and manage the network.
    ▪ Target supply chains, end to end, private & public networks – different management paradigm

• Finding the money
  ▪ Make the case to people and their leaders – why is efficient mobility/accessibility important for you?
  ▪ Preserve user-pays philosophy.
  ▪ Break the link to fuel-based user fees – move to usage-based fees.
  ▪ Transaction-based funding – promises and delivery; accountability - monitoring and reporting.
  ▪ Maintain strong national role, perspective: trips/tons flow freely across state borders.