

INFRASTRUCTURE VISION 2050

Association of Equipment Manufacturers

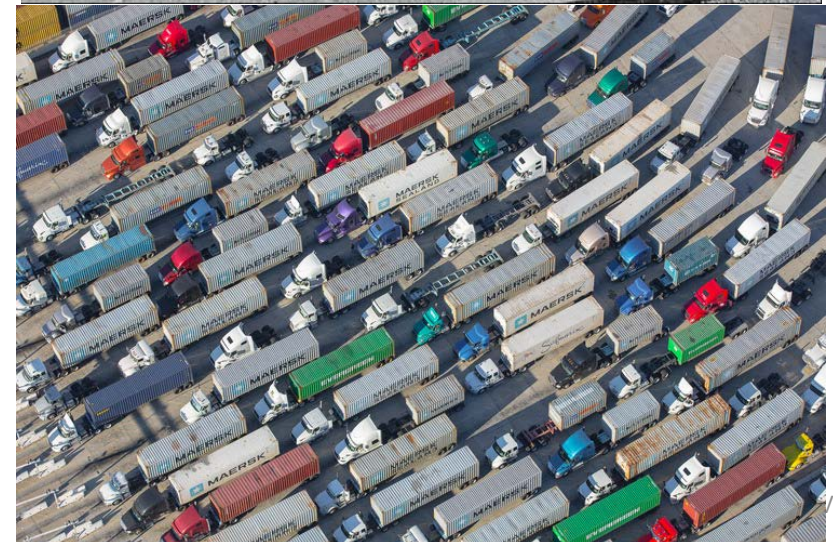
Transportation infrastructure scenarios, needs and opportunities
Joseph L. Schofer



Northwestern | McCORMICK SCHOOL OF
ENGINEERING

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.



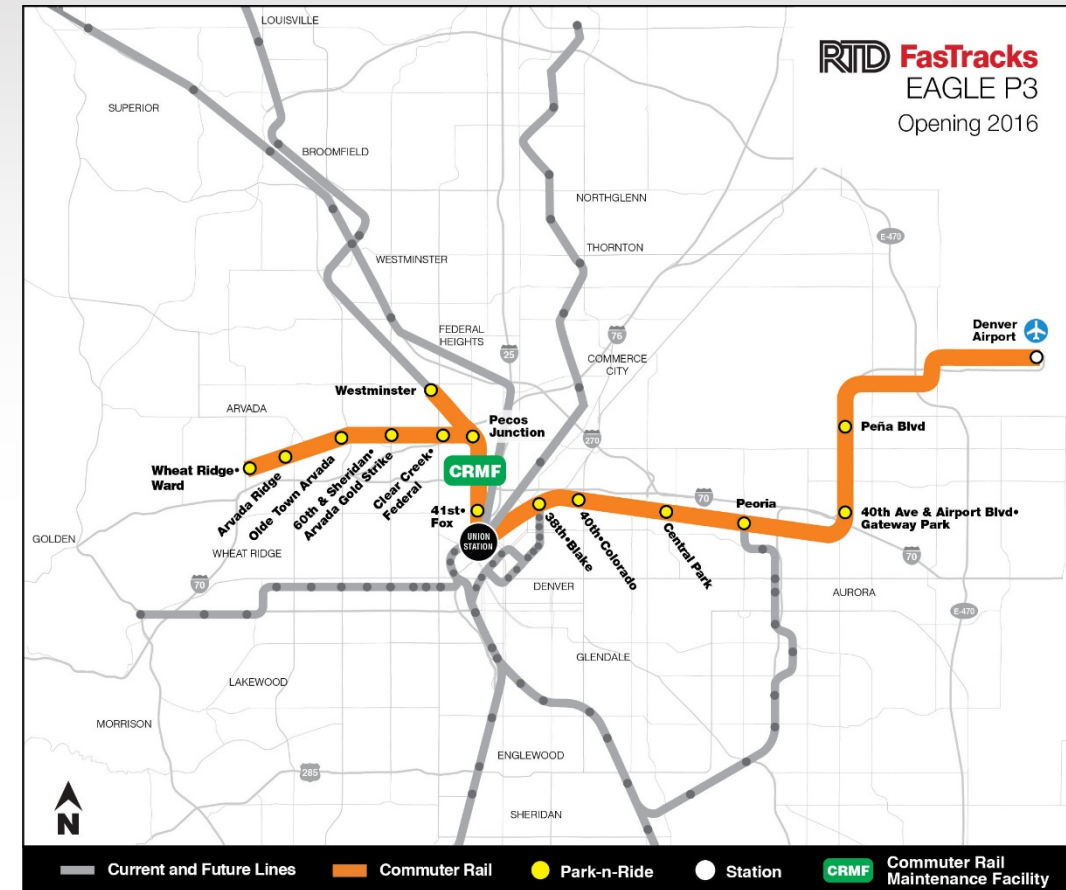
Transportation as driver of the future

- **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?**



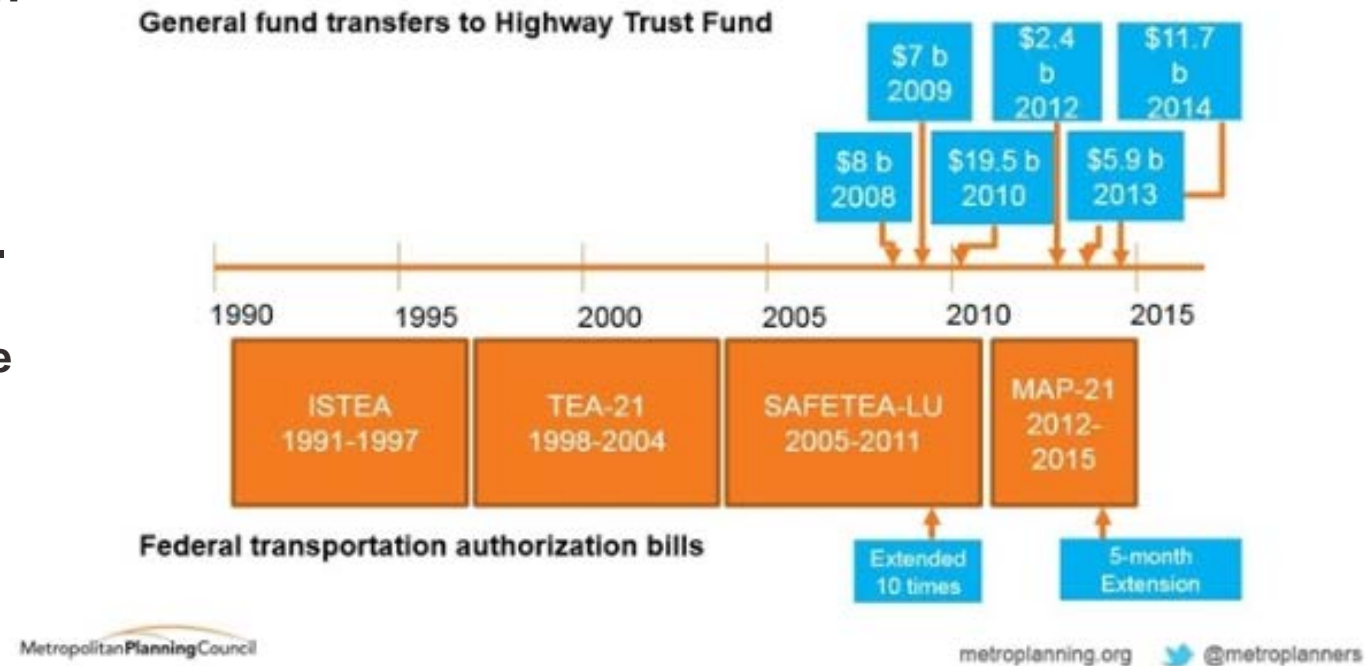
Obstacles to sufficient infrastructure funding

- 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.



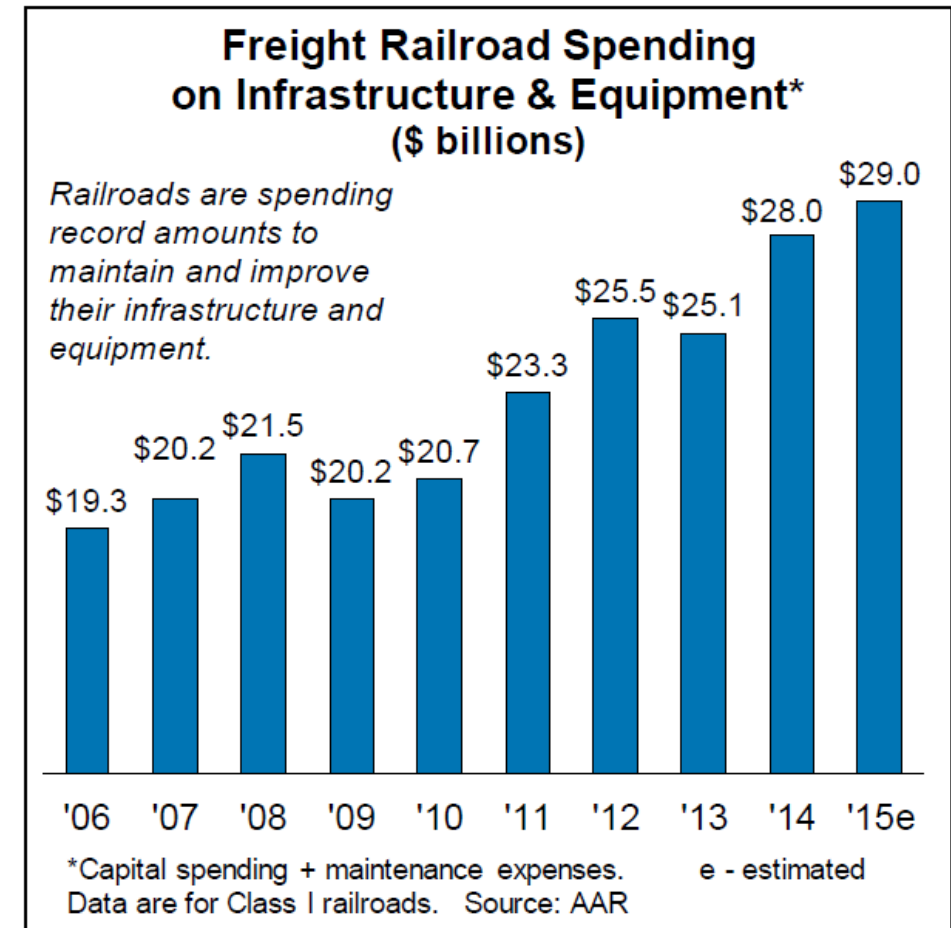
Funding transportation infrastructure – public sector

- 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



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.**