Transportation Infrastructure & Technological Change

School of Economic Sciences

Eric Jessup
Research Professor
Director: Freight Policy Transportation Institute
eric_jessup@wsu.edu
509-335-4987

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What does 100 years of change look like?

Wilson Hall
Completed 1917

The SPARK
Completed 2017
Transportation & WSU

  - Early proponent of deregulation (truck, rail)
  - Shaped subsequent changes to ICC

- Ken L. Casavant (1968-2018)
  - $1.25m (1993-1998) Eastern Washington Intermodal Transportation Study (EWITS)
  - $2.43m (2003-2009) Strategic Freight Transportation Analysis (SFTA)
  - $1.67m (2009-2019) Freight Policy Transportation Institute (FPTI)

  - Director: Freight Policy Transportation Institute
Why Transportation?
What is the function of Transportation...?

- Transportation creates time and place utility
- Movement of people & products
- Creation of markets ... and value that otherwise would not exist
- This is not a recent phenomenon (driven by technological change)
- Transportation affects almost everything

- Especially when considering global supply-chains:
  - Food
  - Energy
  - Environment
  - Health

Issues are often quite complicated
Relationship Between Freight Performance and the Economy
The Road Ahead...

- U.S. transportation infrastructure in need of critical investment
- Technological change is dramatically altering the demands on transportation services and infrastructure
- This puts policymakers at critical nexus
- Current & recent FPTI research projects
U.S. Transportation Infrastructure
Roads / Highways:

- 32% of major roads are in poor or mediocre condition
- 42% of major urban highways are congested

Bridges:

- 11% (one in nine) are structurally deficit
- 25% are functionally obsolete
- Average age is 42 years old
- 30% of bridges have exceeded their 50 year design life

World Economic Forum Ranks the U.S. 12th amongst developed countries for overall infrastructure.
## ASCE Infrastructure Report Card

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Source: American Society of Civil Engineers
Various Measures of Public Spending on Transportation and Water Infrastructure, 1985 to 2014

Index, 2003 = 100

Percentage Change, 2003–2014

44 Nominal Spending
15 Real Spending Using the GDP Price Index
-5 Spending as a Share of GDP
-9 Real Spending Using Infrastructure-Specific Price Indexes

Source: Congressional Budget Office.
Note: GDP = gross domestic product.
Public Spending on Transportation and Water Infrastructure, by Level of Government, 1956 to 2014

Billions of 2014 Dollars

Source: Congressional Budget Office based on data from the Office of Management and Budget, the Census Bureau, and the Bureau of Economic Analysis.

Note: Dollar amounts are adjusted to remove the effects of inflation using price indexes for government spending that measure the prices of materials and other inputs used to build, operate, and maintain transportation and water infrastructure.
State + Federal Gasoline Taxes
(federal gas tax is $18.4 cents per gallon)
July 2018
State + Federal Diesel Taxes
(federal diesel tax is $24.4 cents per gallon)
July 2018
US Ranks 9th in quality of overall Infrastructure

NOTE: The World Economic Forum score on overall infrastructure includes transport, telephony, and energy. Only the top 20 ranked countries are shown.
Half of top global cities with the worst congestion are in US

**Average Daily Hours Spent in Congestion**

- Los Angeles
- New York City
- Moscow
- Sao Paulo
- San Francisco
- London
- Bogota
- Atlanta
- Paris
- Boston
- Miami
- Bangkok
- Mexico City
- Washington, D.C.
- Chicago
- Medellin
- Seattle

**Source:** INRIX, Global Traffic Scorecard 2017, February 2018. Compiled by PGPF.

**Note:** Data are for 2017. Hours spent in congestion is the average number of hours a driver would spend in congestion during peak hours based upon 240 commuting days.
Current Administration Infrastructure Plan:

- $1 trillion......$200 billion funded.....no source for the $200 billion.
- “The President’s budget will be funded through a combination of new Federal funding, incentivized non-federal funding and newly prioritized and expedited projects.”

Key Principles:

- Make targeted federal investments
- Encourage self-help
- Align infrastructure investment with entities best suited to provide sustained and efficient investment
- Leverage the private sector


Source: OMB Fact Sheet on U.S. Whitehouse Infrastructure Plan
TIGER (BUILD) Funding to Rural Areas:
2016 TIGER Grants

2018 BUILD Grants
Technological Change
Technology that is Changing Transportation

- E-Commerce & online ordering / home delivery (Amazon, Blue Apron, Walmart)
  - Freight supply-chain needs
  - Congested cities

- Electric Vehicles
  - Charging stations
  - 15% of cars by 2025
  - Decreasing costs (over $1,000/kw hour in 2010 to below $130/kw hour today)
  - Increasing demand for Lithium carbonate (Australia, Chile, Argentina, China)

- Generating Electricity.....
  - Renewables
  - Oceans of natural gas
  - Technology on managing power grids (SEL)
Technology that is Changing Transportation

- Autonomous vehicles
  - Infrastructure needs
  - Large reduction in space allocated to parking and highway capacity

- Connected vehicles

- Drone delivery?

- How do we fund that future public transportation infrastructure?
  - Policies that link revenue to utilization of public infrastructure
Freight Policy Transportation Institute

• Recently Completed Projects:
  ✓ WSDOT: Improved Methodology to Evaluate Benefits of Highway Preservation
  ✓ USDA: Infrastructure Investment & Economic Modeling: Export Supply Chains
  ✓ USDA: PNW Container Availability Study
  ✓ USACE: Upper Mississippi Transportation Study

• Current Projects:
  ✓ Idaho Transportation Dept. Freight Supply Chain Analysis (EROADS)
  ✓ PacTrans: Confounding Factor Analysis of Commercial Vehicle Accidents
  ✓ USDA: Agricultural Truck Safety Study
  ✓ USDA: PNW Inland Terminal Optimization Model
  ✓ USDA: Livestock Transportation and ELD Mandate
  ✓ USDOT: Freight Data Warehouse: