Transportation and the United States Economy: Implications for Governance

Clifford Winston
Brookings Institution
CWinston@brookings.edu
Overview of My Visit

I am visiting China to hopefully develop a project that assesses and compares the U.S. and Chinese transportation systems to learn from each other.

Chinese researchers interested in participating in this project should please let me know.

I will provide an overview of the U.S. transportation system from an economic perspective.

A central message is the importance of sound policy to promote efficiency and reduce waste.
Outline

- Basic data about the US transportation system
- Analyzing the system in the context of an economy
- Governance to improve transportation’s contribution to an economy
- Sprinkle observations about the Chinese system
Conclusions

- Transportation accounts for a substantial amount of economic activity
- Current U.S. system reflects notable inefficiencies
- Improving system efficiency accounting for effects on non-transport sectors would yield larger gains than suggested by a conventional analysis
- Policy outcomes
  - Deregulation has contributed gains
  - Privatization’s outcomes not clear
  - Technology policy could be critical
Basic Data on Transport System and US Economy

- Total pecuniary spending by firms and consumers $2.1 trillion
- Government spending on infrastructure $0.26 trillion
- Transportation’s share of GDP (17%) is similar to healthcare’s share
- Expenditures in time (freight and travelers) $3 trillion
Value of the Capital Stock

- Highways $2.8 trillion
- Rail network $0.34 trillion
- Pipelines $0.17 trillion
- Public airways, waterways, and transit structures $0.57 trillion
Infrastructure Stock as a Share of GDP Across Countries

China's infrastructure stock as a percentage of GDP is above the world average.

Total infrastructure stock, 2012, % of GDP

<table>
<thead>
<tr>
<th>Country</th>
<th>2012, % of GDP</th>
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<tbody>
<tr>
<td>Brazil</td>
<td>16</td>
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<td>United Kingdom</td>
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<td>Canada</td>
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<td>Italy</td>
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<td>South Africa</td>
<td>87</td>
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<td>Japan</td>
<td>179</td>
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Average excluding outliers, Brazil and Japan

71%
GDP by Industry

Finance remained the nation's top industry in 2013, while government was no. 2 despite efforts to roll back spending.
Inequality or Transportation Capital in the 21st Century

- Wealthy people cannot escape delays when their private planes are prohibited from taking off and when their limousines are stuck in gridlocked traffic

- At the same time, transportation is generally considered to be a merit good—citizens are entitled to accessibility to attain a reasonable quality of life—so it is important for a system to achieve that social goal at minimum cost
Policy Motivation

- Given the large efficiency and distributional stakes, it is vital for transportation capital stocks to generate high returns.

- Public policy can contribute in three ways:
  - Encourage the modes to operate efficiently in their pricing, service, and innovation—regulate or deregulate?
  - Ensure that the infrastructure operates efficiently in pricing, investment, and technology—public ownership or privatization?
  - Technology policy to realize gains from private sector innovations.
Transportation's Effects On Other Sectors

- Labor Markets—job matching, employment, and wages
- International & Domestic Trade Flows—trade costs, product variety
- Industry Competition and Efficiency—scale and scope economies
- Agglomeration Economies in Metropolitan areas
- Transport Inefficiencies Generate Huge Costs Because Entire Economy is Affected
Research Integrating Transportation and Other Sectors

- Transportation as part of a general equilibrium model of the U.S. economy. Find large gains from efficiency improvements without significant increases in spending.

- The full costs of congestion on an economy. How does congestion affect the California economy accounting for unemployment, GDP growth, wages, and trade flows?
Governance: How to Increase in Efficiency?

- Goal is to eliminate static inefficiencies and stimulate innovation and technological advance.
- Deregulation: affected intercity modes, including airlines, railroads, water carriers, and trucking.
- Privatization?: urban transit modes and public infrastructure.
- Technology policy: using and promoting innovations and technological advance by the private sector to improve infrastructure.
Deregulation: Air, Rail, Truck

- Static inefficiencies: prices not aligned with costs; production costs inflated; poor service quality
- Entry of new competitors stimulated competition that led to lower costs and reduced price-cost margins
- Inefficient firms were driven out of the industry
- Welfare Gains:
  - Traditional consumer surplus and profit changes
  - Better service and lower costs also spurs industry development, employment, competition, and greater product variety
Unanticipated Innovations Underlie Gains From Deregulation

- Rail: real time monitoring of shipments and condition of the track enables shippers to apply Just In Time (JIT) Inventory
- Truck: improved routing and scheduling based on information technology; apply JIT Inventory
- Air: yield management programs to make more efficient use of capacity; better match of capacity to demand
- Under regulation firms lacked the ability and incentives to make those innovations
- Global air deregulation, including open skies and cabotage, would generate more gains. Global deregulation could also generate further improvements in surface freight.
Cabotage: A Source of Low Cost Carrier Competition for the US

- US airline industry has consolidated and concerns exist that carriers are raising prices and cutting service in low density areas.
- One approach to addressing claims of insufficient competition is to give cabotage rights to foreign carriers and allow them to serve US routes.
- Current research explores the effect of Ryanair and EasyJet on fares on US routes not served by Southwest and finds a significant decrease in fares.
Public Infrastructure and Transit Inefficiencies

- Growing delays and congestion that increase operating costs and travel time—auto and air
- Budget deficits now occur
- Those are symptoms of:
  - Mispricing—prices don’t reflect costs
  - Suboptimal investment—cost-benefit not used
  - Inflated productions costs—regulations raise labor and capital costs
  - Slow implementation of technological innovations
Inefficiencies (continued)

- The potential gains from efficient policies are large and well documented in the empirical literature.
- Policymakers ignore calls for efficient reforms and seek to raise revenue and spend their way out of the problems.
- Obama’s recent proposal of a 4 year $300 billion highway infrastructure program is an example.
- Unsustainable strategy in the United States.
Privatization: Theory and Practice

- Theory: success depends on market power of private firms, their incentives and ability, and whether consumers can exert competitive pressure.
- Evidence on the effects of privatization in different parts of the world is mixed.
- Evidence in the US is basically non-existent; simulations indicate possible positive scenarios.
- Experiments are crucial for any resolution.
- Careful implementation is also vital as we learned from Railtrack in the United Kingdom.
Technology Policy: Adopting Private Sector Innovations

- General purpose technologies such as GPS navigation services and specific technologies such as Weigh in Motion could be used to improve road pricing, investment, and safety.
- Authorities are impeding technical change by not implementing recent innovations.
- A satellite-based air traffic control system would reduce travel times and operating costs while improving safety—large net benefits.
- Significant delays and cost overruns in implementing the US system.
Transportation modes have improved their performance and safety regardless of the state of their infrastructure.

Autonomous Vehicles: operated by computers have the potential to prevent collisions and reduce delays by creating a smoother traffic flow. Estimates of the benefits depend on market penetration—50% penetration yields annual benefits of $200 billion from reducing externalities.

UK experiments: London and Oxford

Benefits to the broader economy would be larger

Issues are liability and appropriate safety regulations
Innovations (continued)

- Air travel with advanced navigation systems permitting far greater use of the entire airspace, improving safety and speed.
- High end general aviation and some commercial carriers have installed the equipment.
- Estimates of potential benefits in the air sector are large and are even larger when the entire economy is considered
- Problem is that the Federal Aviation Administration has been slow to put in new facilities, train controllers, and approve new flight procedures
- Solution may be to create a private ATC system
Summary and Policy Perspectives

- A nation’s transportation system is a large and vital part of its economy.
- Transport affects many sectors besides the users and suppliers of transportation.
- Many parts of the transport system have been compromised by inefficiencies.
- Deregulation of intercity modes improved their operations. Benefits extend broadly to the economy. Innovations are an important source of those benefits. More benefits are possible.
The inefficiencies from public policies toward infrastructure and transit cannot be denied.

Current inefficiencies compromise spending proposals and lower their returns.

Still, spending on infrastructure can generate significant benefits accounting for the economy-wide effects but they entail the costs of taxation and the misallocation of public funds.

A preferable policy is to generate economy-wide benefits through efficiency improvements with minimal spending.
Summary and Final Comments (continued)

- Status quo bias indicates it is unlikely that efficiency improvements will be generated by policy reforms.

- Alternatively, private modes have led infrastructure—cars were introduced and entrepreneurs built private roads; airplanes were developed and private airports emerged.

- Thus the private sector can contribute to transportation efficiency improvements through modal innovations, such as driverless vehicles and satellite-based ATC.

- Infrastructure performance would then improve, generating benefits throughout the economy.