Background on the Relationship Between Transport and Trade
Ken Casavant
BACKGROUND ON THE RELATIONSHIP BETWEEN TRANSPORT AND TRADE

PRESENTATION TO THE WASHINGTON STATE TRANSPORTATION COMMISSION

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We Will Talk About...

1. Transportation infrastructure and economic development
   - Factors of impact assessment
   - Bilateral trade and spillover effects
   - Spatial temporal models

2. Transportation demand as driver
   - Agricultural commodities trade
   - Freight services and modal share
   - Ports and inland waterways

3. Next research steps
The Issue

- Relationship between infrastructure and economic development is “clear” but maybe not so clear
  - Aschauer – 1989
  - Clark et al. – 2004
  - Easterly – 1993

- General agreement on transportation improvements, combined with political and institutional conditions is positive
  - Nadiri and Marnumes – 1994
  - Banister and Berechman – 2001
  - Istrate et al. – 2010
Expert competitiveness in trade appears related to U.S. and competitors’ investments and is the subject of a state and national push.

So: here we are in this white paper and subsequent model development.
Transport as a Necessary but not Sufficient Condition

Combined Effects of Economic, Financial and Political Factors
## Infrastructure Investments and Output

### Estimates of Output Elasticity of Public Infrastructure Investments

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Geographic Scale</th>
<th>Output Elasticity of Public Investment</th>
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<td>Aschauer (1989)</td>
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- But, causality is still ambiguous
- Scale and scope of investment affects findings
Bilateral Trade and Spillover Effects

- Simultaneous changes in bilateral trade
- Liberalization and technological investments is muddied by spillover effects
- Studies show port efficiencies have largest impact on bilateral trade flows
Bilateral Trade and Spillover Effects (Continued)

- Deteriorating infrastructure affects trade
  - -3 elasticity of trade cost and flow
  - 12% increase in transport costs reduced trade volume by 28%
Spatial Temporal Models

- A whole host of spatial equilibrium models at regional and international levels
- Grain trade and domestic transportation improvements have received most attention
  - Samuelson – 1952
  - Fuller et al. – 2001
  - Fellini et al. – 2001
  - Costa and Parr – 2007
Spatial Temporal Models (Continued)

- Combines production and transportation costs
- Focus on export volume, prices and producer revenue
- *Ex ante* vs. *ex poste*
- Studies look at spatial location of improvement –
  - U.S. vs. competitors
  - Processors vs. producers
  - Differing improvements by mode
Demand and Needs Explosion

Value of U.S. Agricultural Trade

Dollars (in billions)

Ag. Exports
Ag. Imports

# Export Importance by Food Groups

## Export Share of Production for Selected Agricultural Commodities and Totals

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### Export Share of Production for U.S. Major Agricultural Commodities

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Competitive Countries for Wheat

Top 5 Wheat Exporting Countries by Volume

- U.S.
- EU-27
- Canada
- Australia
- Argentina

Million Metric Tons

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Competitive Countries for Soybeans

Top 5 Soybean Exporting Countries by Volume
Demand for Freight and Port Investments

U.S. International Freight and Port Services Trade

Billion Dollars


Freight services
Port services
Who Buys Our Exports?

Modal Share of U.S. Merchandise Trade

- U.S. total land trade
- U.S. total water trade
- U.S. total air trade
- Other and unknown

- Value
- Weight
What Are We Selling and What is Changing?

U.S. Pacific Region’s Export Product Profile for Top 15 Categories

- Computer & Electronic Products
- Transportation Equipment
- Agricultural Products
- Machinery; Except Electrical
- Chemicals
- Miscellaneous Manufactured Commodities
- Food Manufactures
- Waste & Scrap
- Petroleum & Coal Products
- Electrical Equipment; Appliances & Components
- Primary Metal Manufactures
- Fabricated Metal Products
- Fish; Fresh/Chilled/Frozen & Other Products
- Plastics & Rubber Products
- Paper

Pacific Region’s Exports (billion dollars)

2010
2005
2000
Findings

- Ill defined relationship between trade and transportation
- Studies support investment
- Demand is and is hoped to be increasing
- Spatial equilibrium computable model will be developed
Questions?

Check out the Freight Policy Transportation Institute’s website!

www.fpti.wsu.edu

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