Mobility, Transit and Growth: The Role for Markets

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Overview of Key Points

1. Improving mobility is crucial to urban economic growth and productivity
2. Dynamic travel patterns create a transportation planning challenge
3. US public transit experience provides a cautionary tale for other cities and nations
4. Market and consumer-oriented approaches to transportation and public transit are crucial to ensuring mobility and the long term sustainability of transportation modes—cars and transit
UNDERSTANDING THE MOBILITY-PRODUCTIVITY CONNECTION
Mobility, productivity and the Opportunity Circle

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Research on mobility & urban productivity

- **Remy Prud’homme**
  - Labor market expands 15%, productivity increases 3%

- **Robert Cervero**
  - Increase speeds 10%, output increases 1%

- **Daniel Graham**
  - Travel speeds increase 5%, productivity increases 1%
  - Different industries impacted differently by congestion

- **David Hartgen**
  - Similar to Remy Prud’homme
  - Downtowns most vulnerable to congestion
US Research: Benefits of increased Mobility to Denver
US Research: Benefits of increased mobility to Dallas
US Research: Benefits of increased mobility to Seattle
• Building capacity to keep pace with demand is crucial.
Capacity must keep pace with demand: Case of Atlanta

- Capacity has not kept pace with VMT
- Arterial network is among the least well developed
- “Hub and spoke” system doesn’t recognize complexity of modern travel patterns
Access through improved mobility would dramatically increase with new investments.
Key strategies for improving mobility and urban productivity

1. Manage the system more efficiently
   - Traffic signal optimization
   - Road pricing
   - Improved public transit

2. Build more capacity
   - Right type of capacity
   - At the right time

3. Redesign the transportation network
THE CHALLENGE OF TRANSPORTATION PLANNING
What would a new “design” look like?

• A “spiderweb” approach to design
• More connections through local roads and arterials
• Fewer major “trunk” roads
• More balanced road network
Challenges of System Redesign: Chicago
An Application: Reason Foundation Plan for Chicago plan

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1a  Cross Town Tunnel
1b  Cross Town Tunnel (Midway extension)
2   Kennedy Tunnel
3   Eisenhower Tunnel
5   Outer Beltway
6   Lake County Corridor
7   Northbrook-Palatine
8   Elgin-O’Hare Extension
9   Illiana Corridor
Houston

--expressways serve regional traffic

--arterials serve local traffic
Ring roads & the grid: Beijing Expressways

Surface & Underground Expressways

Key Interchanges & Access Points
HOW ARE NEW INVESTMENTS PRIORITIZED AND FINANCED?

User Fees
Road Pricing
Value Capture
Primacy of road pricing

- Monetize the value/benefit
- Dedicated revenue stream for transportation projects
  - Monetizes the value of projects
  - Sustainable revenue stream
- “Willingness to pay” becomes the standard for triggering new investments
  - Prioritizes projects
  - Identifies value added
Road pricing enables P3s

• Road pricing generates a sustainable revenue stream
• Facilities that “pay for themselves” will attract private equity (ideal P3)
• Private capital can leverage public dollars for those that don’t
  ▪ Availability payments
• Even small projects benefit
  ▪ Queue jumpers
  ▪ Interchanges and ramps
  ▪ High volume arterials & collectors
WHAT ROLE FOR PUBLIC TRANSIT?

Large cities need diverse modes of transportation
- equity
- mobility
- access
Cities depend on layered transportation networks and systems

<table>
<thead>
<tr>
<th>Mode</th>
<th>Transportation efficiency characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>Travel distances &lt; than one mile; appropriate in all land uses except very low densities</td>
</tr>
<tr>
<td>Bicycles</td>
<td>Travel distances 2-3 miles</td>
</tr>
<tr>
<td>Automobile</td>
<td>All travel distances in low to moderate densities</td>
</tr>
<tr>
<td>Light Rail/Trolley</td>
<td>Corridors with medium densities and mixed uses at origins and destinations</td>
</tr>
<tr>
<td>Bus</td>
<td>Travel distances &gt; 2 miles in urban areas with heavily traveled corridors</td>
</tr>
<tr>
<td>Heavy Rail/Metro</td>
<td>Very high density urban areas</td>
</tr>
</tbody>
</table>
Triangulating urban transport modes
(Based on US conventions)

Transit has a crucial role, particularly in larger cities

<table>
<thead>
<tr>
<th>Regional Density</th>
<th>&lt; 2,500 people/sq. mile</th>
<th>2,500 to 5,000 people/sq. mile</th>
<th>5,000 to 10,000 people/sq. mile</th>
<th>10,000 to 20,000 people/sq.mile</th>
<th>&gt; 20,000 people/sq. mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region Size</td>
<td>Urbanized area</td>
<td>Post-1950 suburb</td>
<td>Older suburb, post-auto central city &amp; downtown</td>
<td>Central city neighborhood, mid-size city downtown</td>
<td>Pre-auto downtown, Manhattan, Brooklyn</td>
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<tr>
<td></td>
<td>Low-density suburban, rural and semi-rural pattern</td>
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<tr>
<td>&lt; 1 million</td>
<td>(Charlotte, Dayton, Austin, Honolulu)</td>
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<td>• One core</td>
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<td></td>
<td>• 30 mile radius</td>
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<td></td>
<td>• Multiple towns/villages</td>
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<tr>
<td>1-5 million</td>
<td>(Indianapolis, Las Vegas, Sacramento, San Antonio, Tampa)</td>
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<td></td>
<td>• Polycentric</td>
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<tr>
<td></td>
<td>• 1 downtown</td>
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<td></td>
<td>• 60 mile radius</td>
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</tr>
<tr>
<td></td>
<td>• Multiple large towns/villages</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5-10 million</td>
<td>(Chicago, Houston, Miami, Hong Kong, Toronto)</td>
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<tr>
<td></td>
<td>• Polycentric</td>
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<td></td>
<td>• 1-2 downtowns</td>
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<td></td>
<td>• 60+ mile region</td>
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<tr>
<td></td>
<td>• Multiple large towns/small cities</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10 + million</td>
<td>(Los Angeles, New York, Beijing, London, Paris, Tokyo)</td>
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<tr>
<td></td>
<td>• Polycentric</td>
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<tr>
<td></td>
<td>• Multiple large downtowns</td>
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<td></td>
<td>• 100+ mile region</td>
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<tr>
<td></td>
<td>• Multiple large towns &amp; cities</td>
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</tbody>
</table>
Need to layer in transportation alternatives at the right time.
PUBLIC TRANSIT IN PRACTICE

A cautionary tale from the US
Transit use is highly concentrated in the US market.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Metropolitan statistical area</th>
<th>Used public transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New York-Northern New Jersey-Long Island, NY-NJ-PA</td>
<td>2,673,447, 30.5</td>
</tr>
<tr>
<td>2</td>
<td>Chicago-Naperville-Joliet, IL-IN-WI</td>
<td>506,221, 11.5</td>
</tr>
<tr>
<td>3</td>
<td>Washington-Arlington-Alexandria, DC-VA-MD-WV</td>
<td>404,829, 14.1</td>
</tr>
<tr>
<td>4</td>
<td>Los Angeles-Long Beach-Santa Ana, CA</td>
<td>360,028, 6.2</td>
</tr>
<tr>
<td>5</td>
<td>San Francisco-Oakland-Fremont, CA</td>
<td>304,111, 14.6</td>
</tr>
<tr>
<td>6</td>
<td>Boston-Cambridge-Quincy, MA-NH</td>
<td>283,582, 12.2</td>
</tr>
<tr>
<td>7</td>
<td>Philadelphia-Camden-Wilmington, PA-NJ-DE-MD</td>
<td>256,987, 9.3</td>
</tr>
<tr>
<td>8</td>
<td>Seattle-Tacoma-Bellevue, WA</td>
<td>147,955, 8.7</td>
</tr>
<tr>
<td>9</td>
<td>Atlanta-Sandy Springs-Marietta, GA</td>
<td>92,326, 3.7</td>
</tr>
<tr>
<td>10</td>
<td>Miami-Fort Lauderdale-Pompano Beach, FL</td>
<td>85,771, 3.5</td>
</tr>
<tr>
<td>11</td>
<td>Baltimore-Towson, MD</td>
<td>82,119, 6.2</td>
</tr>
<tr>
<td>12</td>
<td>Minneapolis-St. Paul-Bloomington, MN-WI</td>
<td>78,837, 4.7</td>
</tr>
<tr>
<td>13</td>
<td>Portland-Vancouver-Beaverton, OR-WA</td>
<td>63,877, 6.1</td>
</tr>
<tr>
<td>14</td>
<td>Pittsburgh, PA</td>
<td>62,928, 5.8</td>
</tr>
<tr>
<td>15</td>
<td>Houston-Sugar Land-Baytown, TX</td>
<td>60,547, 2.2</td>
</tr>
</tbody>
</table>

Public transit market share has stabilized at low levels

Work Trip Market Share

<table>
<thead>
<tr>
<th>Year</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>12.9%</td>
</tr>
<tr>
<td>1970</td>
<td>8.9%</td>
</tr>
<tr>
<td>1980</td>
<td>6.4%</td>
</tr>
<tr>
<td>1990</td>
<td>5.3%</td>
</tr>
<tr>
<td>2000</td>
<td>4.6%</td>
</tr>
<tr>
<td>2006</td>
<td>4.7%</td>
</tr>
</tbody>
</table>
Public transit passenger miles are recovering overall.

Passenger Miles

<table>
<thead>
<tr>
<th>Year</th>
<th>Passenger Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>48.0</td>
</tr>
<tr>
<td>1970</td>
<td>41.0</td>
</tr>
<tr>
<td>1980</td>
<td>39.9</td>
</tr>
<tr>
<td>1990</td>
<td>38.0</td>
</tr>
<tr>
<td>2000</td>
<td>43.4</td>
</tr>
<tr>
<td>2006</td>
<td>49.3</td>
</tr>
</tbody>
</table>
Ridership leveled off during the recession

Total Public Transit Ridership, 1990 to 2011
US transit’s long-term crisis

• Market share is elusive
  ▪ Commuting is 15% of travel

• Ridership is sensitive to service quality and price
  ▪ Transit is an “inferior good”

• Transit systems are faced with chronic deficits
  ▪ Riders represent a net loss on the margin
  ▪ Severe maintenance backlogs
Direct user fees are not the principal source of revenues

Distribution of Operating Revenues: 2010

- Fares: 35%
- Local: 26%
- State: 26%
- Federal: 8%
- Other: 5%

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Commercial revenue share of transit capital & operating expenses
(Source: publicpurpose.com)

Commercial Revenues (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial Revenues (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>95.0%</td>
</tr>
<tr>
<td>1970</td>
<td>79.3%</td>
</tr>
<tr>
<td>1980</td>
<td>31.4%</td>
</tr>
<tr>
<td>1990</td>
<td>27.8%</td>
</tr>
<tr>
<td>2000</td>
<td>25.2%</td>
</tr>
<tr>
<td>2006</td>
<td>23.5%</td>
</tr>
</tbody>
</table>
Observations on US public transit policy & investment

- Investment in rail has minimized value of bus
  - All successful transit systems depend on a well functioning bus network
- Taxis and “demand response” modes are very small part of US market
- No legal role for jitneys and small bus fleets
  - Private competition is illegal
- Most ridership is dependent population
CAN US PUBLIC TRANSIT RECOVER?
FSU Symposium on Transit Productivity and Efficiency

• Three dozen transit industry leaders, innovators and researchers
• Ten former senior executives
  ▪ Seven current or former CEOs
• Several prominent transit critics
• **Question:** Can market-oriented reforms improve transit productivity and efficiency?
Identified barriers to transit productivity and efficiency

- Lack of a business model
- Incentives for efficiency
- Lack of competition
- Lack of focus
- Ideology
- Lack of system thinking
- Transit agency culture
- Failure to enact value capture
- HOV/HOT lane regulations
- Revenue doesn’t link consumption with supply
- Abandonment of market perspectives
- Local politics
- Optimism bias
- Industry lobbying
- Land-use planning
- Organizational inertia/path dependency
- Funding silos
- Sustainable funding
Federal Barriers

- Vehicle design limits
- Unfunded mandates
- Davis Bacon & labor regulations
- Congress (earmarks)
- Federal group think
- Americans with Disabilities Act
- Discretionary grants
Most Important Barriers to Transit Productivity and Efficiency

- Lack of business model: 17.9%
- Federal regulation: 15.0%
- Lack of competition: 9.7%
- Federal funding silos: 7.2%
- Lack of focus: 6.8%
- Ideology: 5.3%
- Failure to capture land value: 4.8%
- Lack of Comprehensive Planning: 4.8%
- Transit agency culture: 4.3%
- Absence of incentives to promote transit: 3.9%
Comparision of RTD and Private Contract Costs 2010

1. Private contractors pay fuel tax, sales tax, property tax, and vehicle registration fees which RTD does not pay.
2. RTD costs are 2010 actual costs.
3. RTD total costs include all variable costs, fixed costs, and depreciation on operating facilities and support equipment.
4. RTD has statutory limitation on insurance liability. Private carriers do not have statutory limitation on insurance liability.
Moving beyond current conventions

• Market pricing along congested routes
• Transit and taxi vouchers for low-income users
• Allow private competition
• Focus on core mission of improving mobility and access
  ▪ Transit agencies are not economic development agencies
  ▪ Transit agencies are not regional planning agencies
CONCLUDING THOUGHTS

And possible implications for Lima, Peru
First Principles for regional transportation networks

1. Sufficient physical capacity to handle travel demand
   - New capacity where demand warrants the investment
   - ITS to ensure network efficiencies are maximized

2. Web-like connections to different components of the road network

3. Market-priced to manage regional flows along major corridors based on consumer demand and choice
Balancing the transportation network: Roads

- Limited access highways carry large volumes of traffic intended for cross regional (county) destinations
- High volume intermediate roads carry intra-regional traffic
  - Boulevards
  - Queue jumpers
- Well developed arterials for local traffic
  - Multiple routes to multiple destinations
- Multiple connection opportunities
  - Allow the easy diversion of traffic when faced with bottlenecks
Moving Forward: Roads

• Adopt user fees to
  ▪ Prioritize investments
  ▪ Create sustainable revenues streams
• Expand capacity to keep pace with demand
• Differentiate roads by function within the transportation network
• Identify synergies with transit
  ▪ Express bus
  ▪ Bus Rapid Transit
Moving Forward: Transit

- User & customer focused transit agencies
- Keep transit grounded in a sustainable fiscal framework
  - Revenues tied to use
  - Spending tied to performance
- Maintain an enterprise model for transit operations
- Encourage dynamism and innovation through customer driven adaptation to changing needs and preferences.
A few thoughts on Lima

- Embrace “ordered chaos” of *combis* & taxis
- Curb rights to establish property rights among taxis and *combis*
- Auction access rights to fixed route service
  - Regular bus
  - BRT
- Allow land uses to respond to benefits created by access to transportation investments
- Be proactive with road investments
Thank you!

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