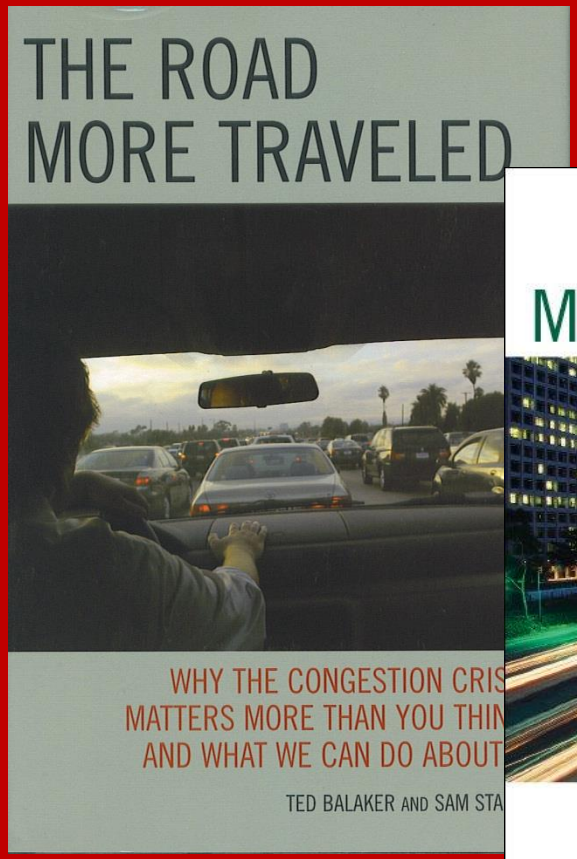

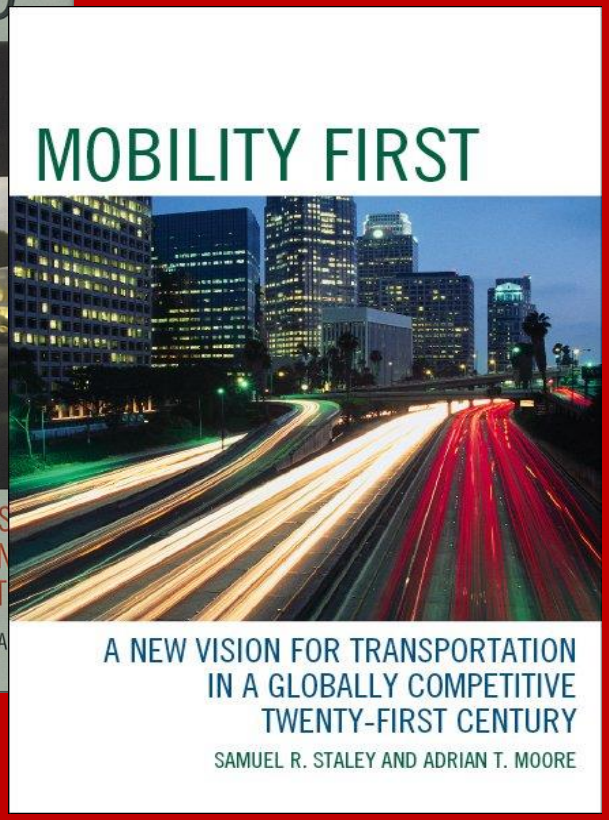

Mobility, Transit and Growth: The Role for Markets

Samuel R. Staley, Ph.D.
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Florida State University &
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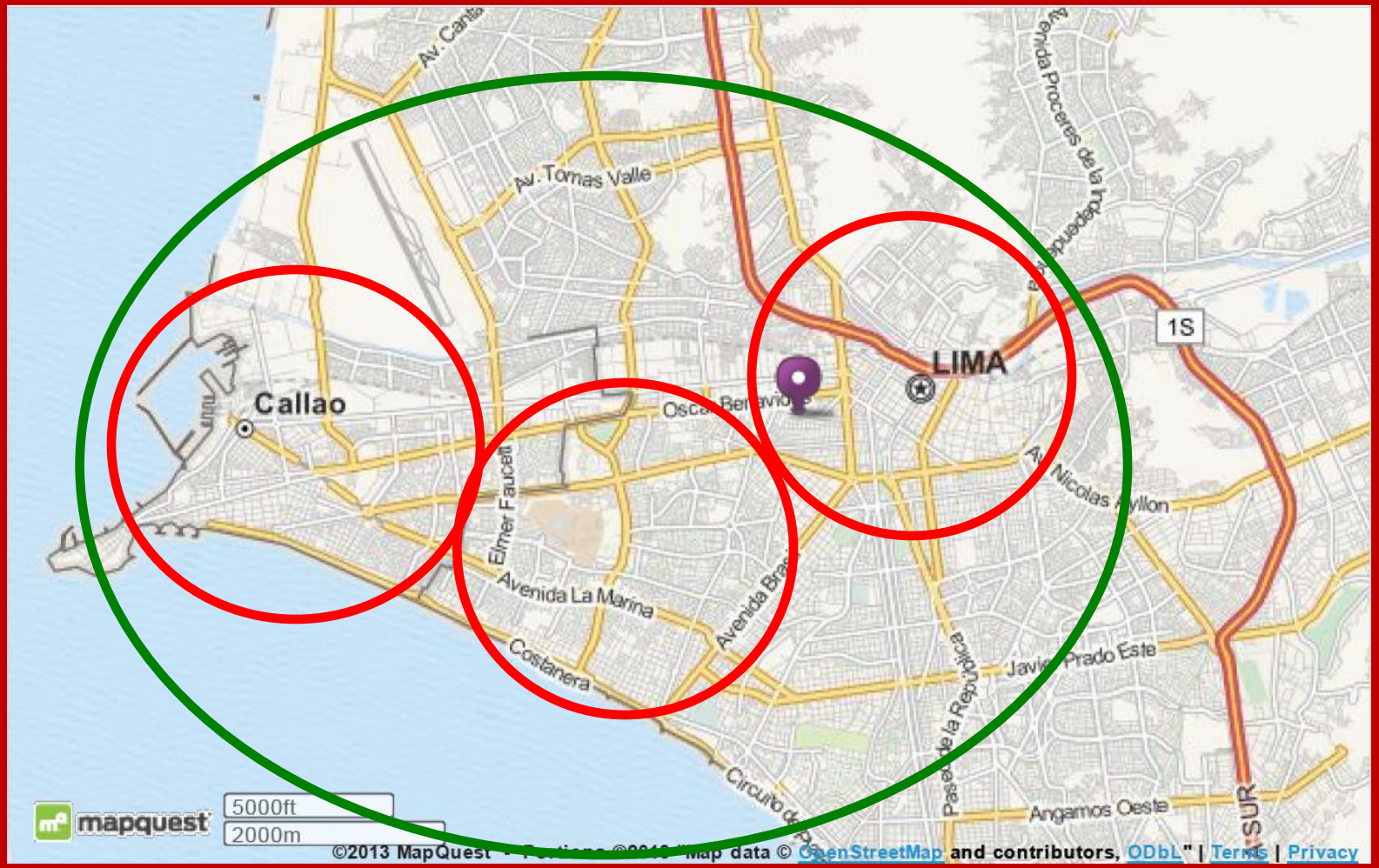
Presentation prepared for X International Convention of Economics, Universidad Peruana de Ciencias Aplicadas, 2 December 2013, Lima, Peru.

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

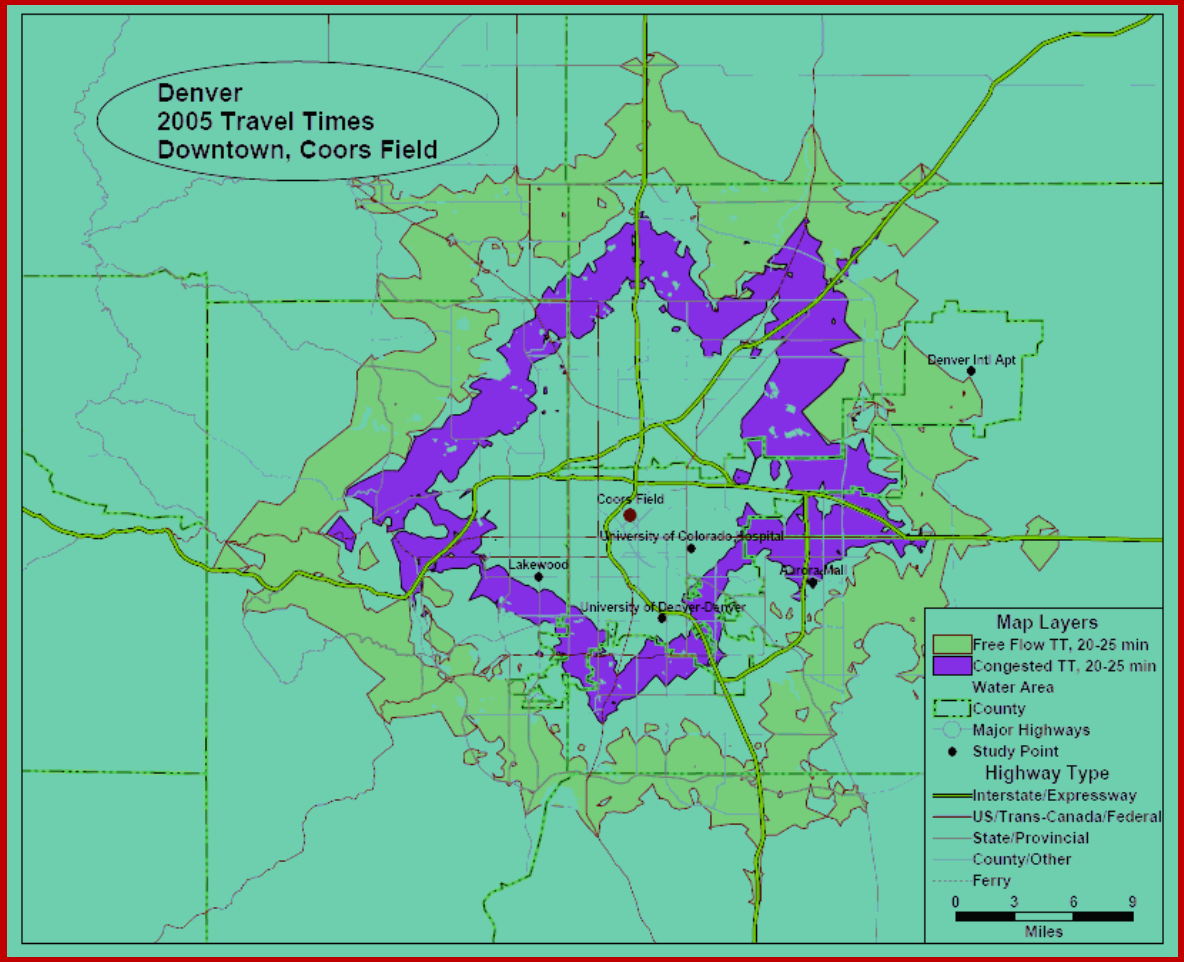
Mobility, productivity and the Opportunity Circle



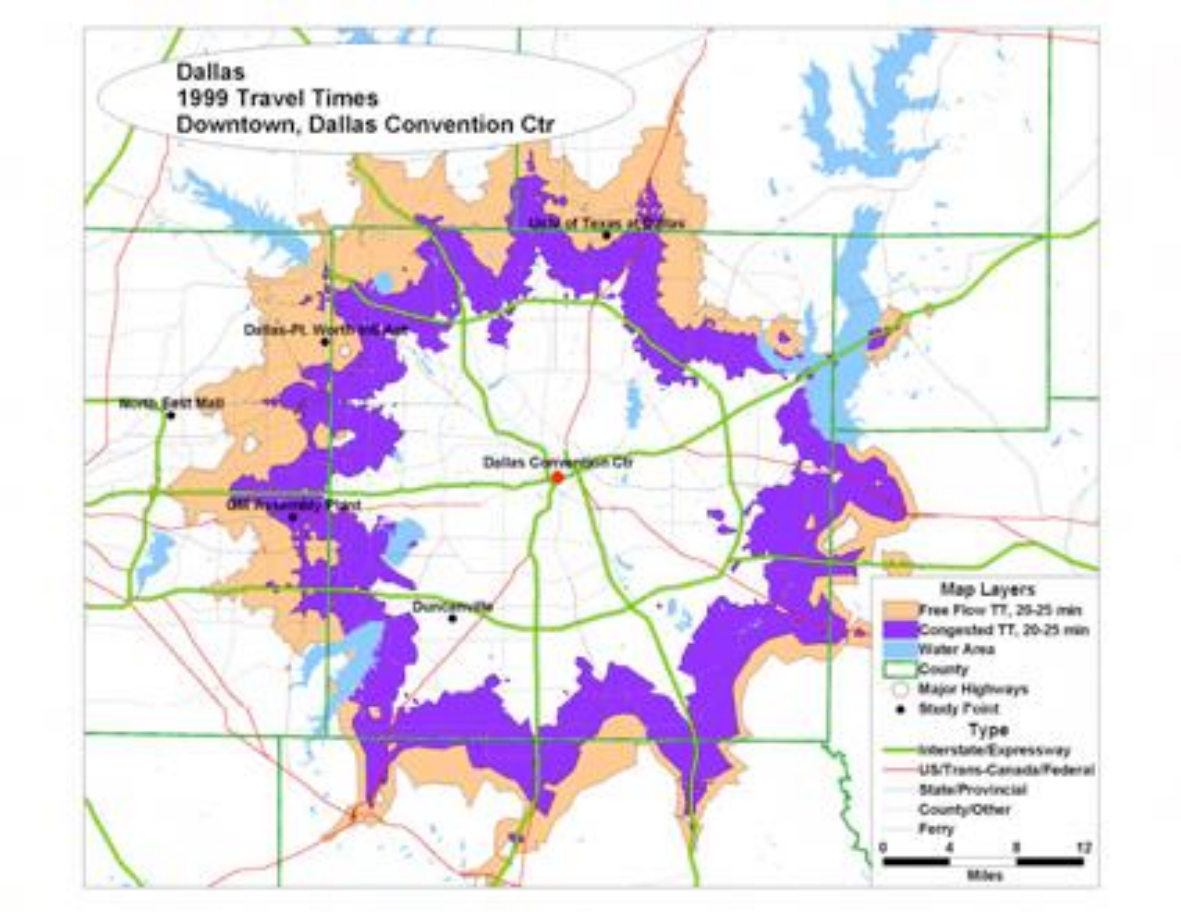
Research on mobility & urban productivity

- **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**

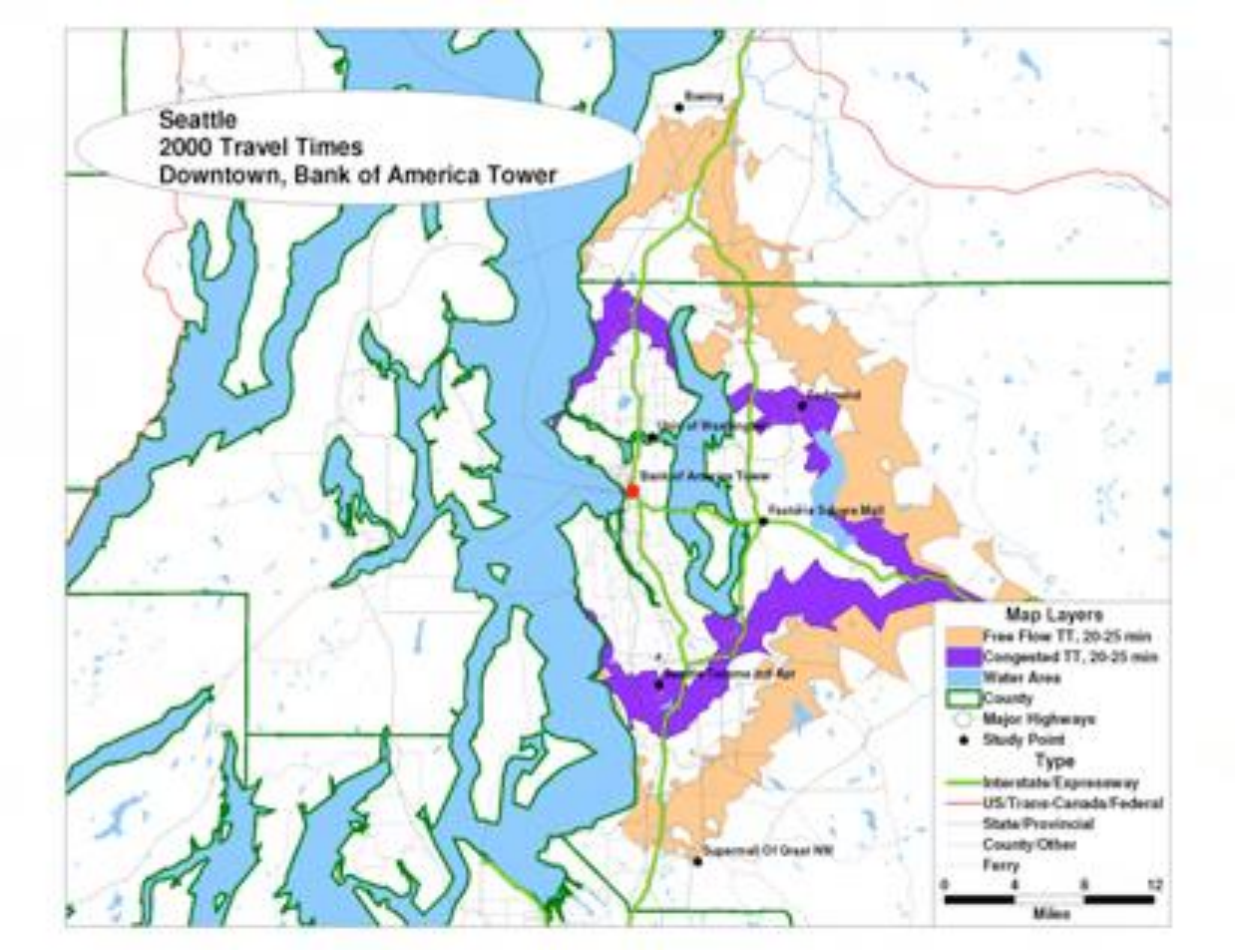
US Research: Benefits of increased Mobility to Denver



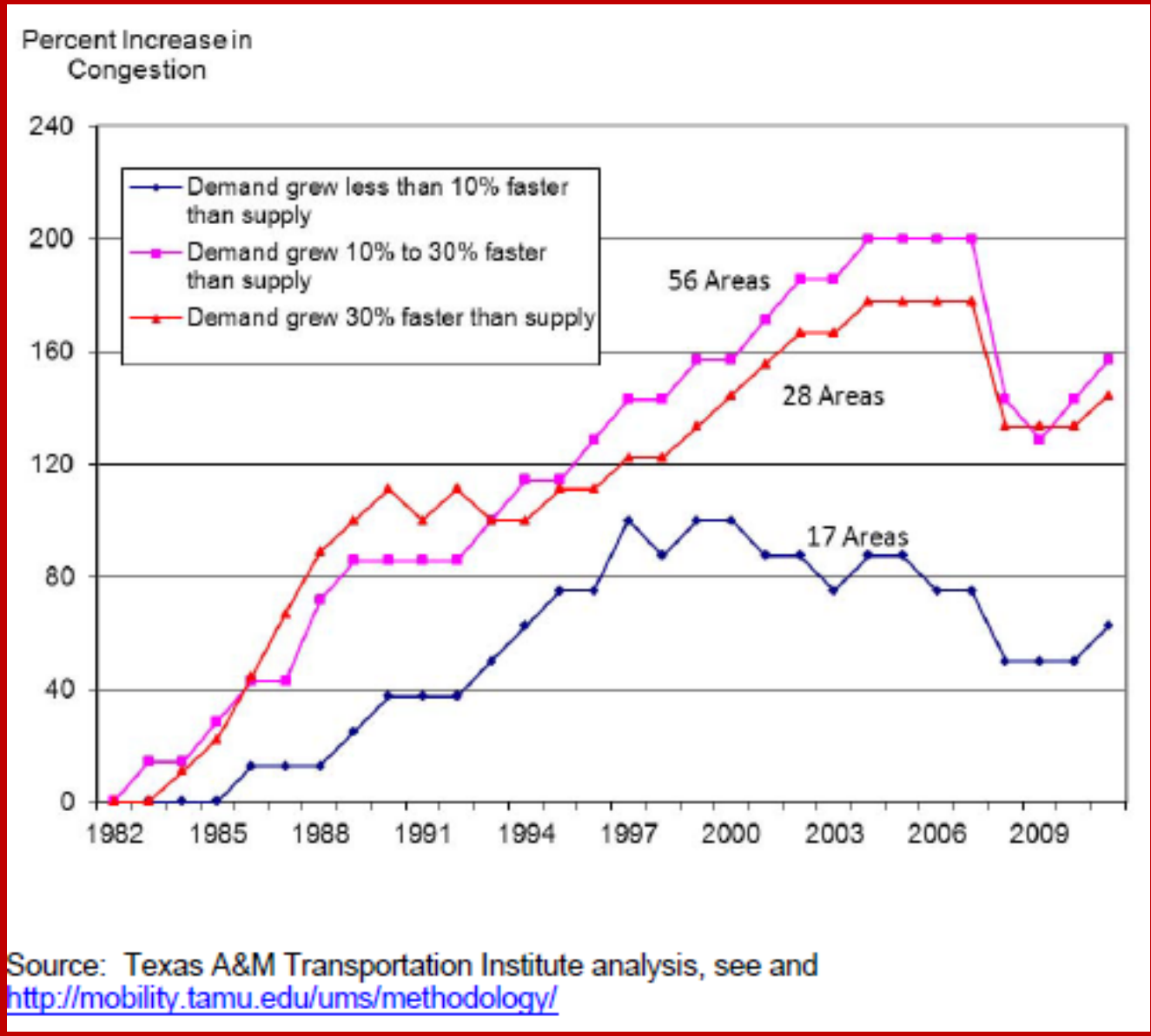
US Research: Benefits of increased mobility to Dallas



US Research: Benefits of increased mobility to Seattle

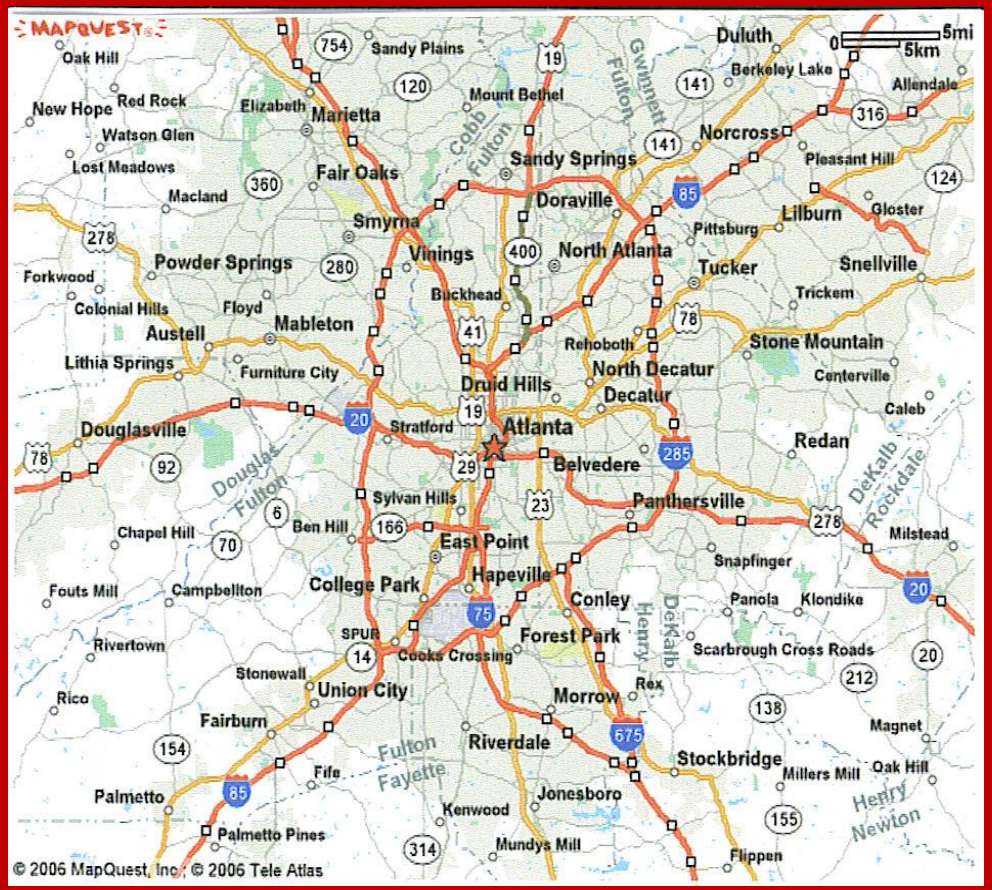


- **Building capacity to keep pace with demand is crucial**



Source: Texas A&M Transportation Institute analysis, see and http://mobility.tamu.edu/ums/methodology/

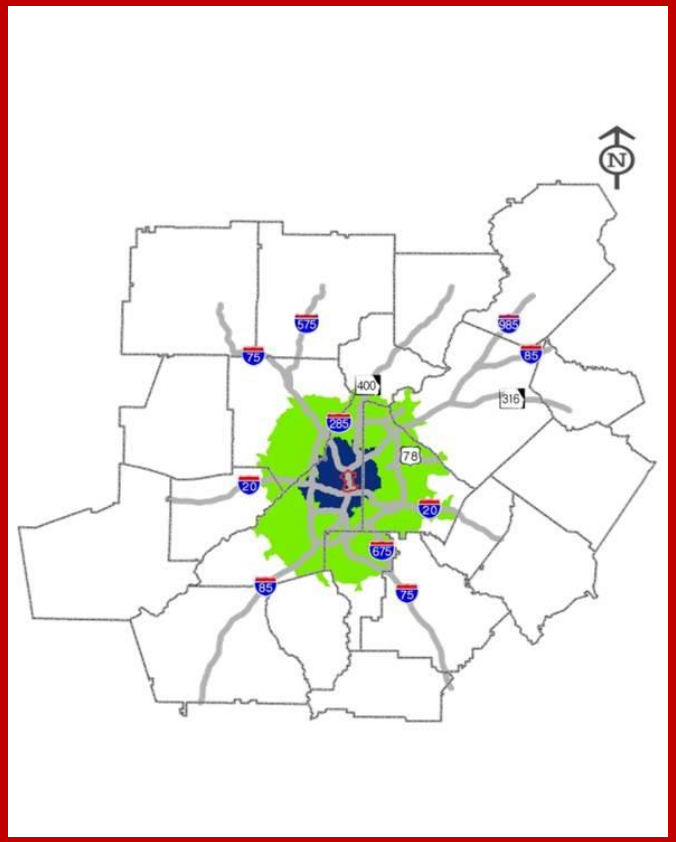
Capacity must keep pace with demand: Case of Atlanta



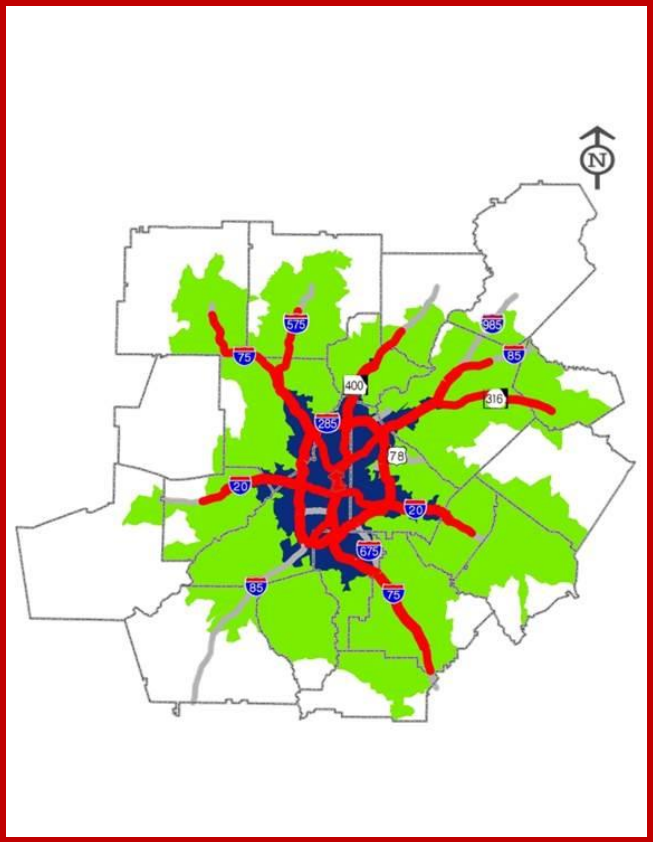
- Capacity has not kept pace with VMT
- Arterial network is among the least well developed
- "Hub and spoke" system doesn't recognize complexity of modern travel patterns

Access through improved mobility would dramatically increase with new investments

Atlanta: Current



Atlanta: New investments



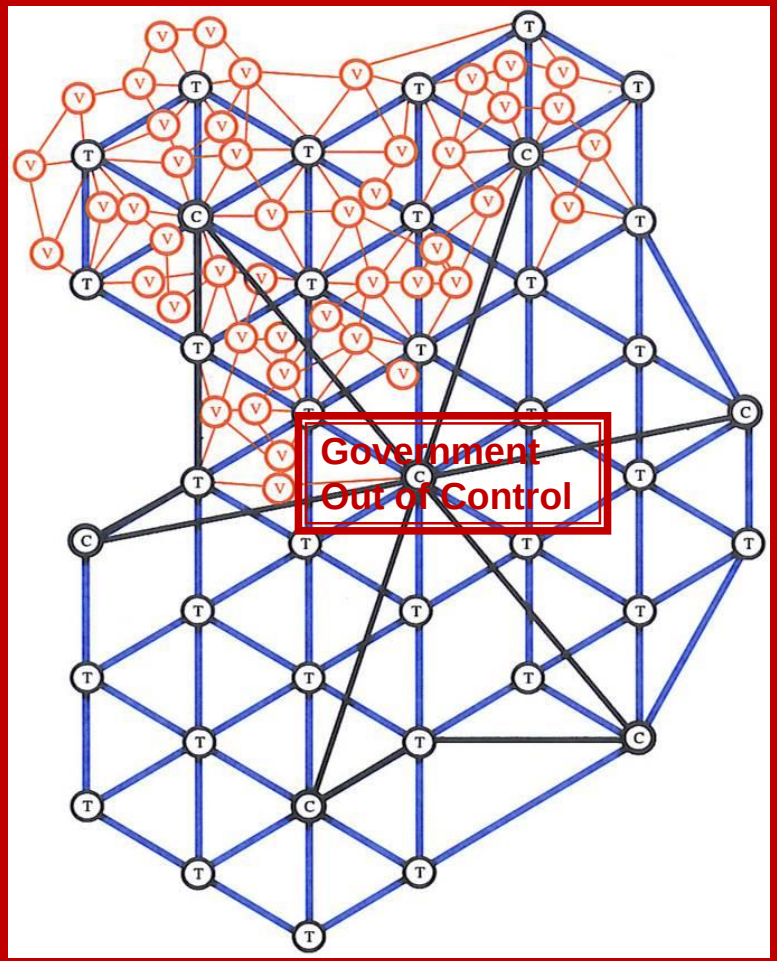
Key strategies for improving mobility and urban productivity

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. <u>Redesign</u> the transportation network

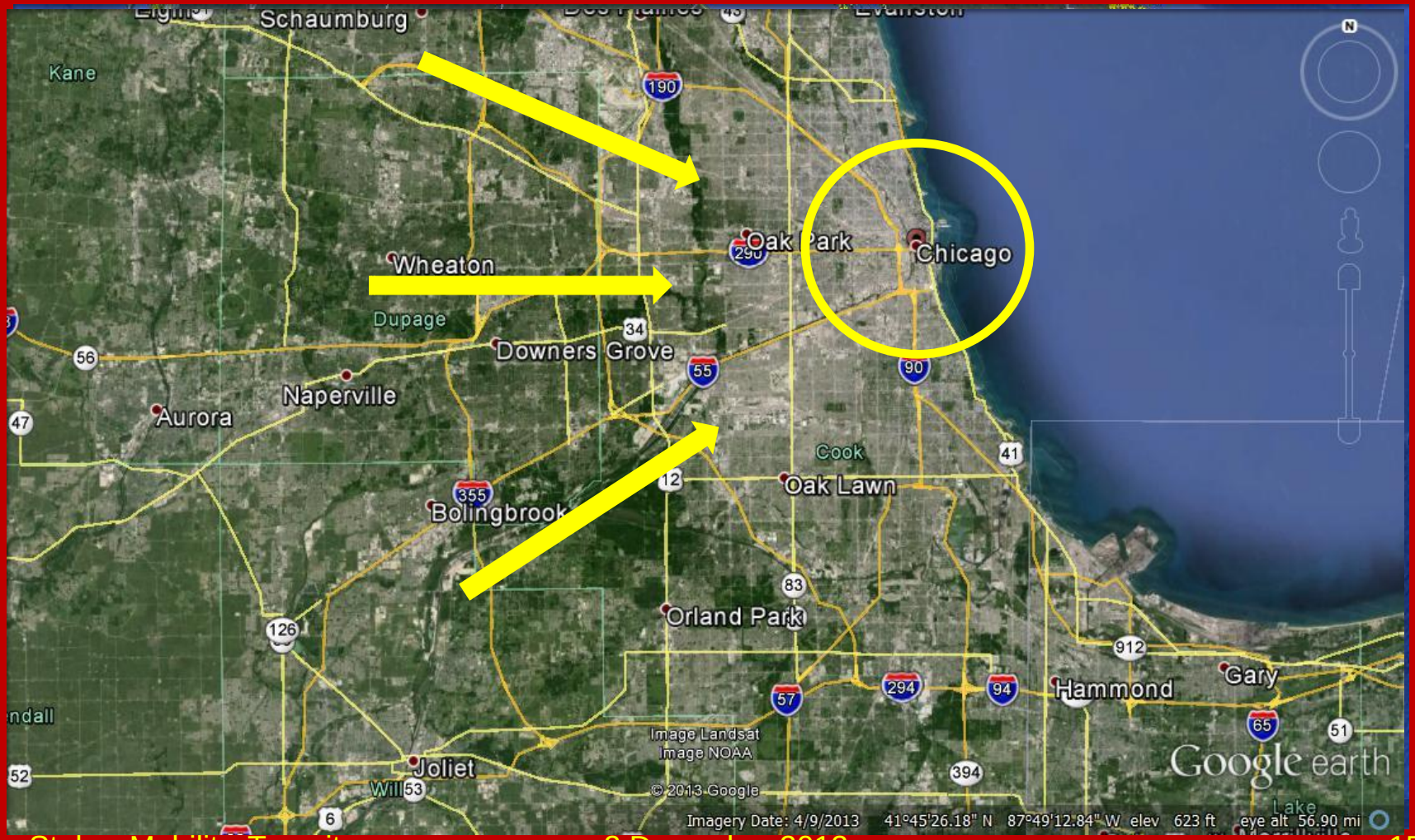
THE CHALLENGE OF TRANSPORTATION PLANNING

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



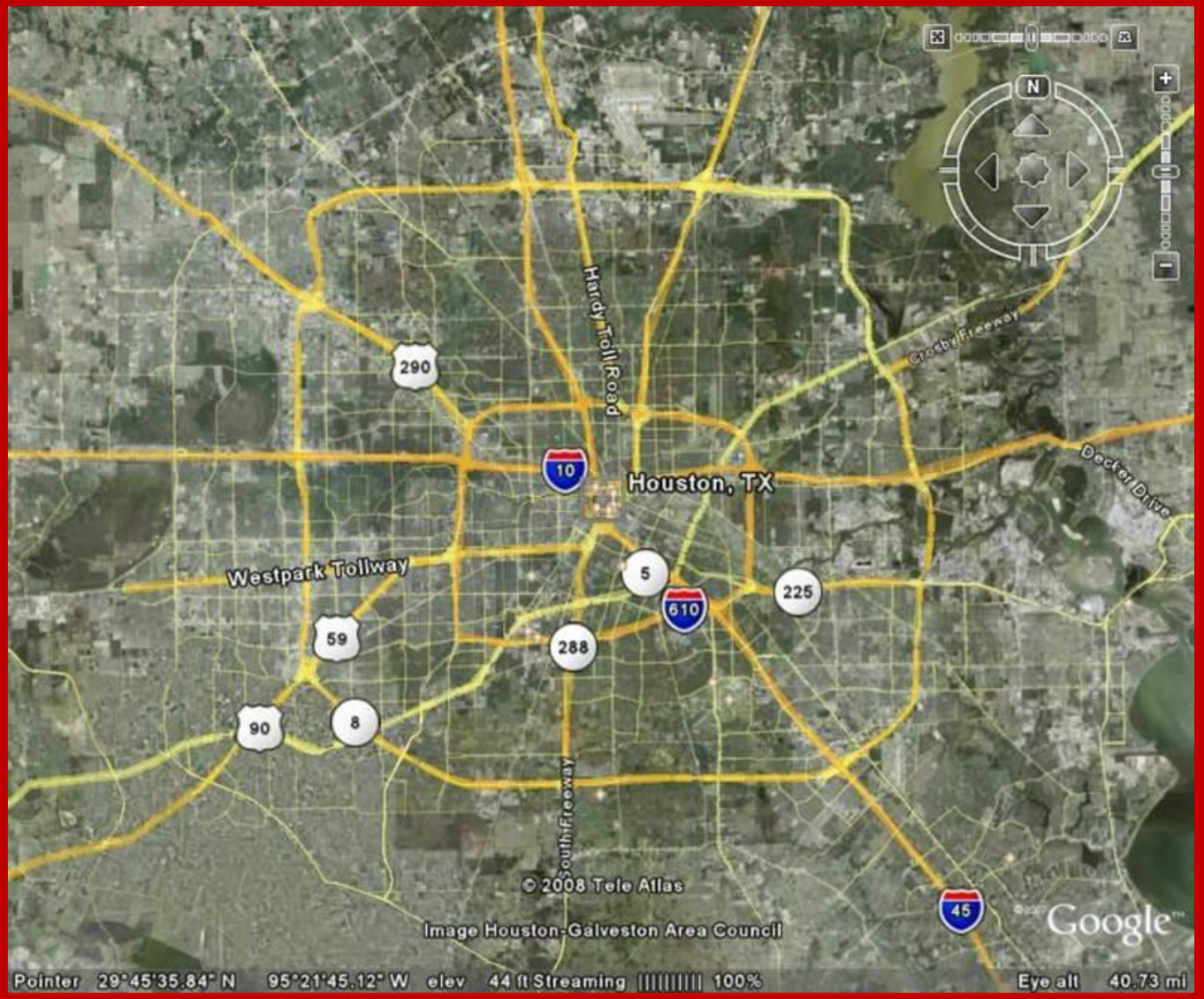
An Application: Reason Foundation Plan for Chicago plan

- 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

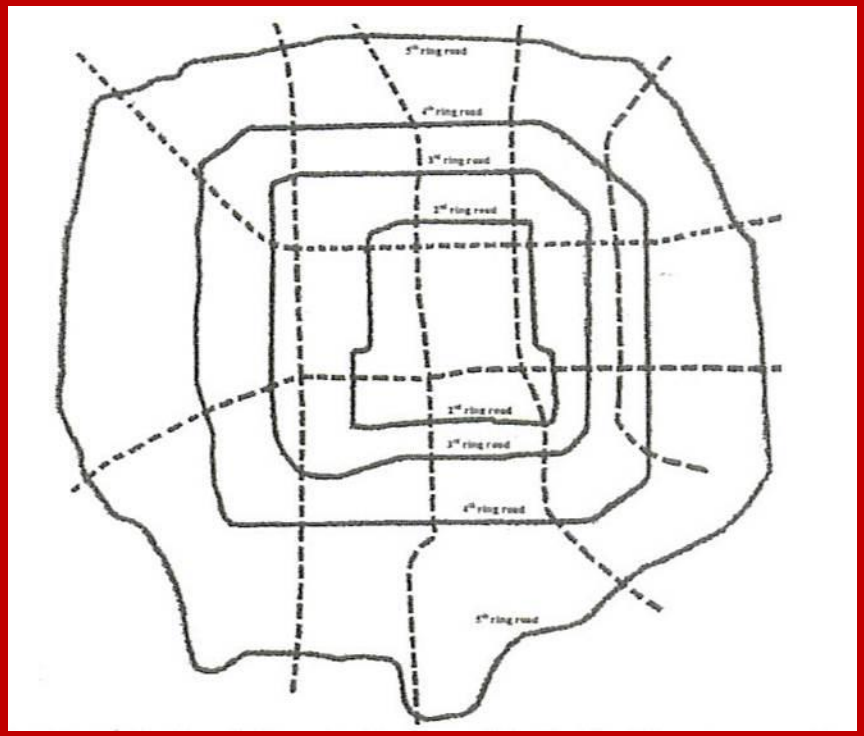
--expressways serve regional traffic

--arterials serve local traffic

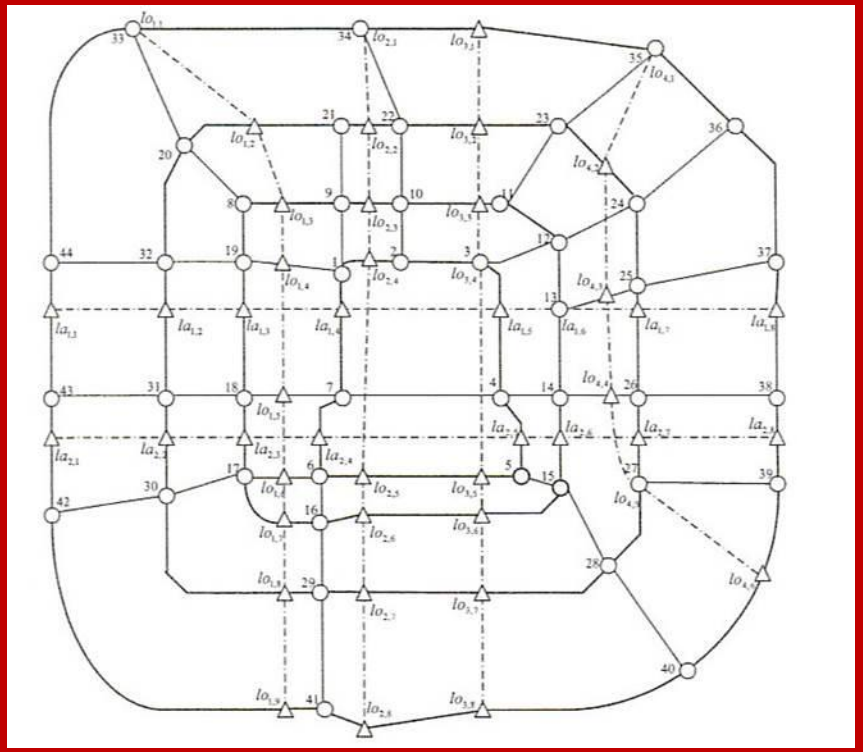


Ring roads & the grid: Beijing Expressways

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

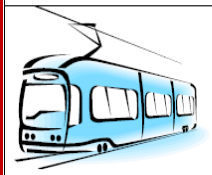
-equity

-mobility

-access

Cities depend on layered transportation networks and systems

Although the foundation will be the road network

Symbol	Mode	Transportation efficiency characteristics
	Walking	Travel distances < than one mile; appropriate in all land uses except very low densities
	Bicycles	Travel distances 2-3 miles
	Automobile	All travel distances in low to moderate densities
	Light Rail/Trolley	Corridors with medium densities and mixed uses at origins and destinations
	Bus	Travel distances > 2 miles in urban areas with heavily traveled corridors
	Heavy Rail/Metro	Very high density urban areas

Triangulating urban transport modes

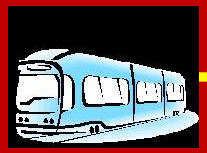
(Based on US conventions)

Transit has a crucial role, particularly in larger cities

Regional Density / Region Size	< 2,500 people/sq. mile	2,500 to 5,000 people/ sq. mile	5,000 to 10,000 people/ sq. mile	10,000 to 20,000 people/ sq.mile	> 20,000 people/ sq. mile
Urbanized area	Low-denisty suburban, rural and semi-rural pattern	Post-1950 suburban	Older suburb, post-auto central city & downtown	Central city neighborhood, mid-size city downtown	Pre-auto downtown, Manhattan, Brooklyn
< 1 million *(Charlotte, Dayton, Austin, Honolulu,* • One core • 30 mile radius • Multiple towns/villages					
1-5 million *(Indianapolis, Las Vegas, Sacramento, San Antonio, Tampa)* • Polycentric • 1 downtown • 60 mile radius • Multiple large towns/villages					
5-10 million *(Chicago, Houston, Miami, Hong Kong, Toronto)* • Polycentric • 1-2 downtowns • 60+ mile region • Multiple large towns & small cities					
10 + million *(Los Angeles, New York, Beijing, London, Paris, Tokyo)* • Polycentric • Multiple large downtowns • 100+ mile region • Multiple large towns & cities					

Need to layer in transportation alternatives at the right time

Village **Mega City**



PUBLIC TRANSIT IN PRACTICE

A cautionary tale from the US

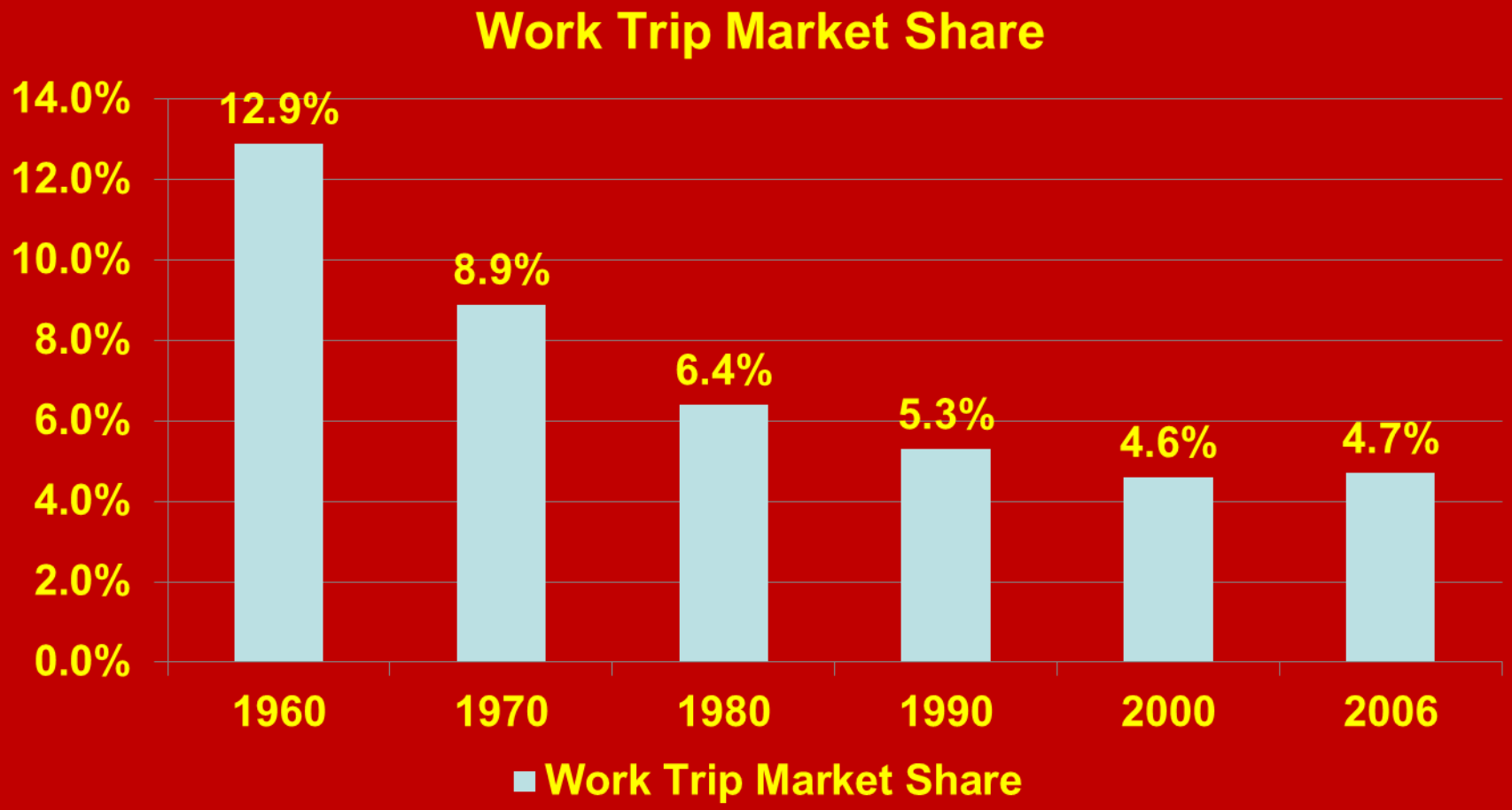
Transit use is highly concen-trated in the US market

Top 15 U.S. Metropolitan Statistical Areas Ranked by Number of Workers Age 16 and Older Who Commuted to Work by Public Transportation: 2009

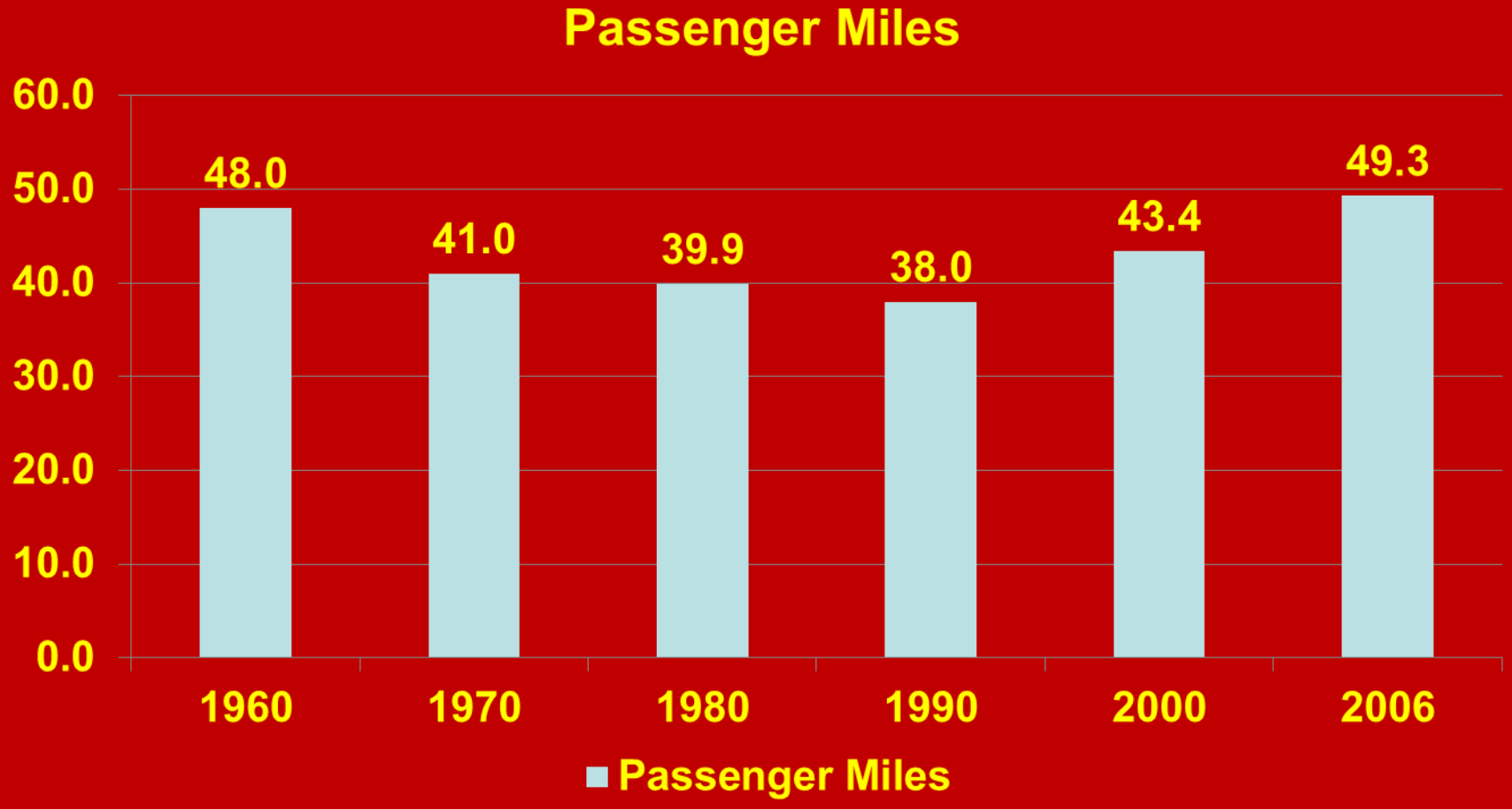
Rank	Metropolitan statistical area	Used public transportation	
		Number	Percent
1	New York-Northern New Jersey-Long Island, NY-NJ-PA	2,673,447	30.5
2	Chicago-Naperville-Joliet, IL-IN-WI	506,221	11.5
3	Washington-Arlington-Alexandria, DC-VA-MD-WV	404,829	14.1
4	Los Angeles-Long Beach-Santa Ana, CA	360,028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

Source: U.S. Census Bureau, American Community Survey, 2009.

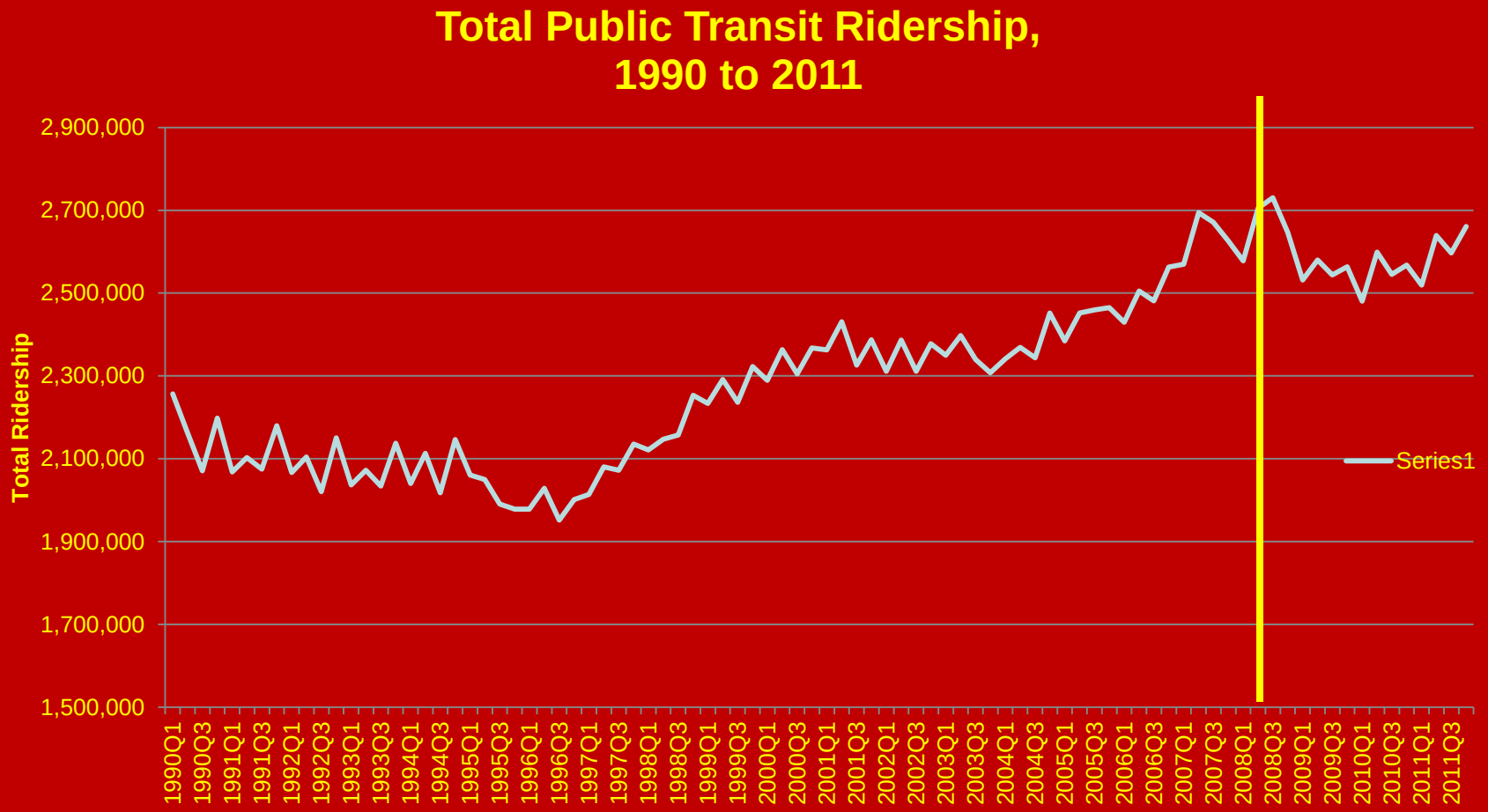
Public transit market share has stabilized at low levels



Public transit passenger miles are recovering overall



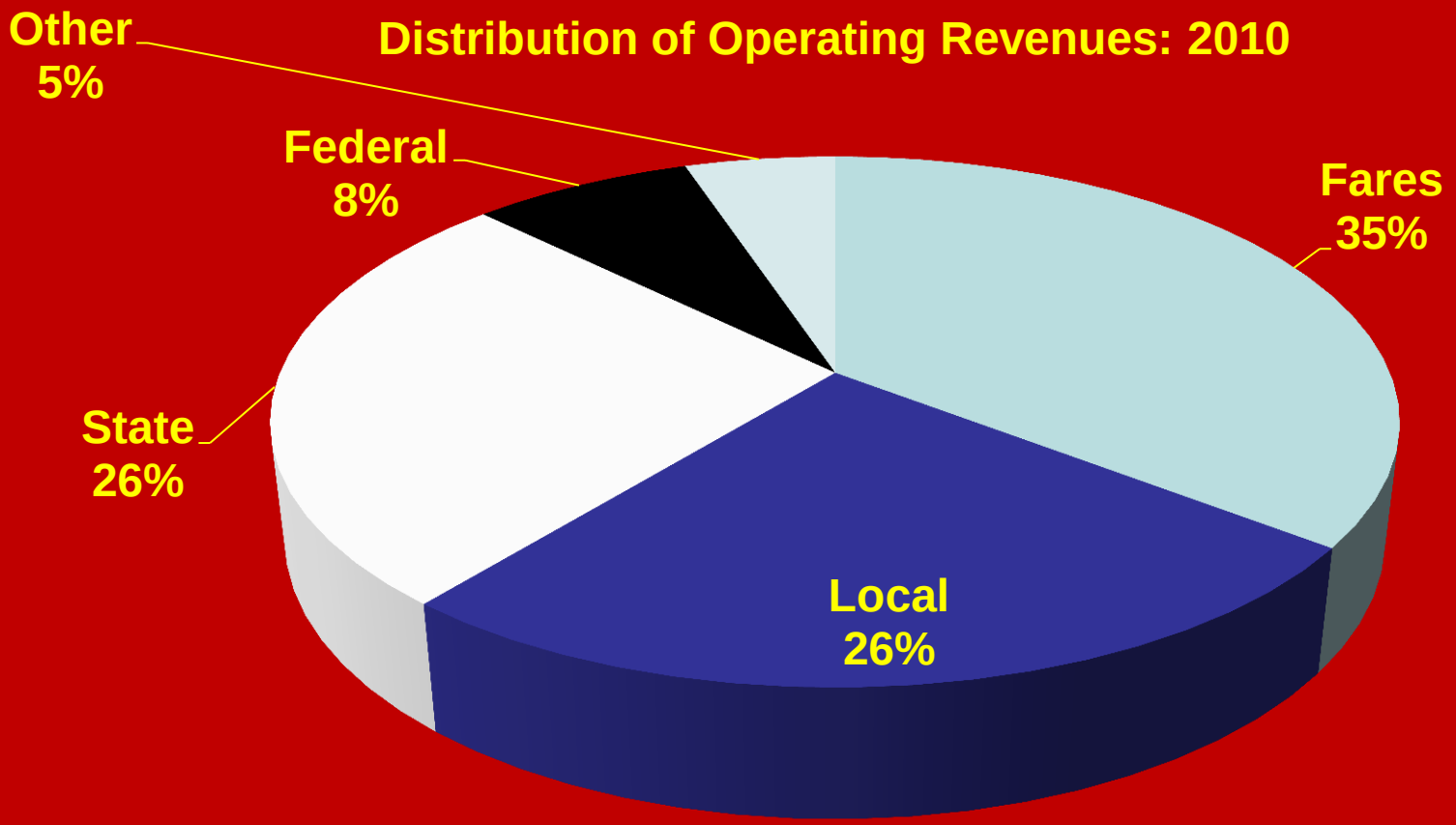
Ridership leveled off during the recession



US transit's long-term crisis

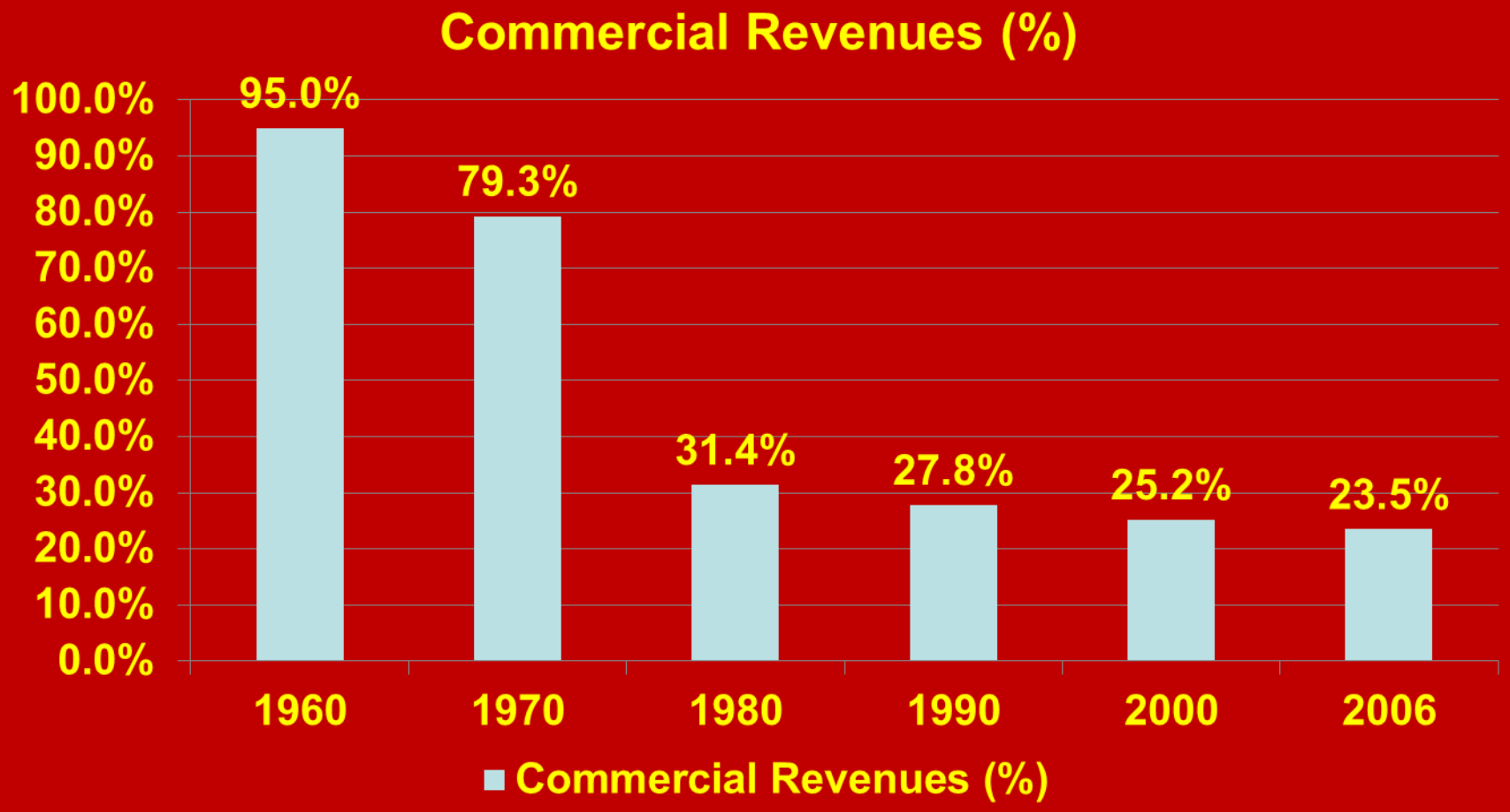
- Market share is elusive
  - Commuting is 15% of travel
- Ridership is sensitive to service quality and price
  - Transit is an "inferior good"
- Transit systems are faced with chronic deficits
  - Riders represent a net loss on the margin
  - Severe maintenance backlogs

Direct user fees are not the principal source of revenues



Commercial revenue share of transit capital & operating expenses

(Source: publicpurpose.com)



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?

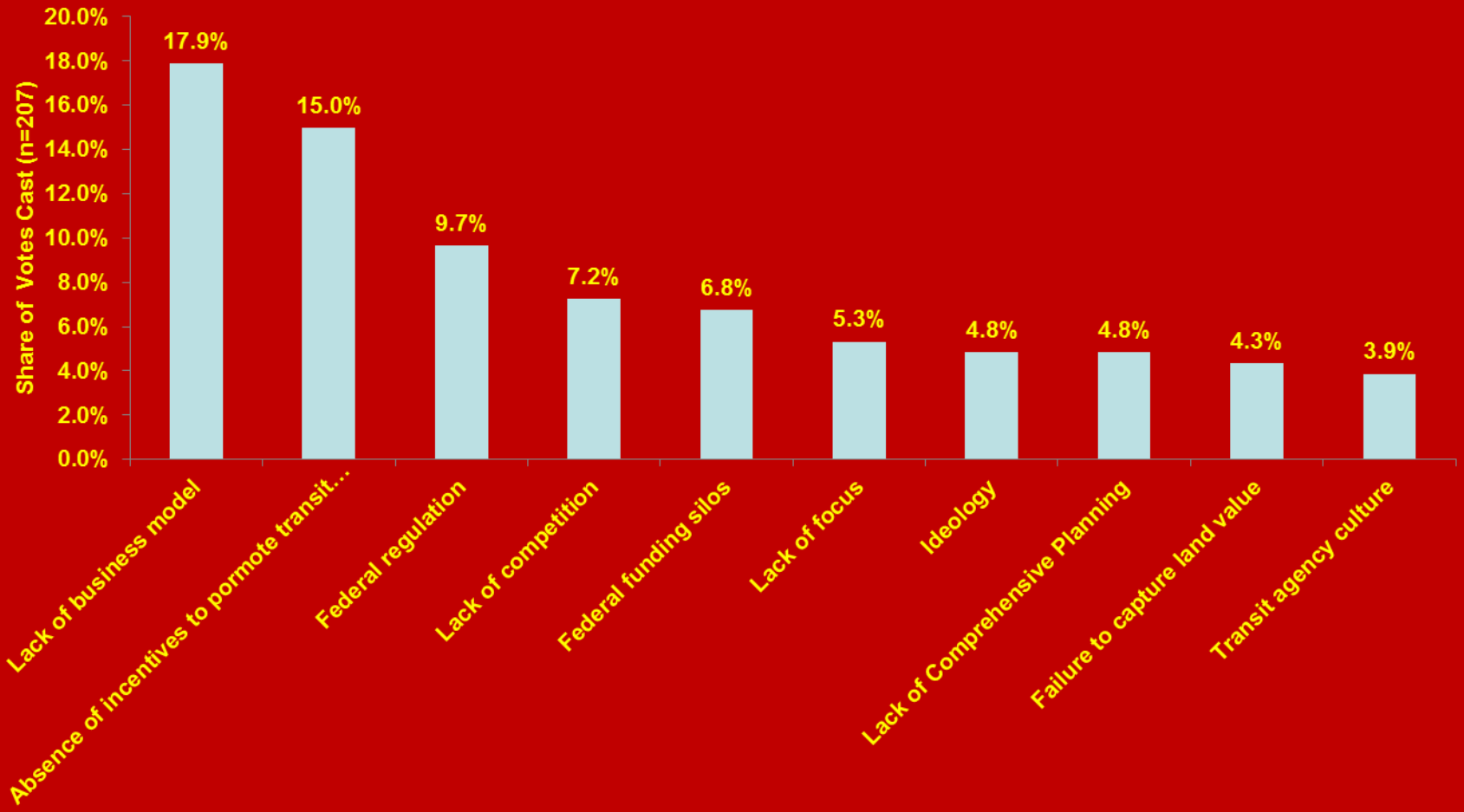
Identified barriers to transit productivity and efficiency

- 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



Public Private Partnerships: Denver

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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