Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SWUTC/12/476660-00051-1		

4. Title and Subtitle	5. Report Date
Moving the Concept of Megaregions into Transportation Planning: Workshop Proceedings	August 2012
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Carol Abel Lewis, Ph.D.,Sara Land, Bethelhem Afefayane	Report 476660-00051

9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Center for Transportation Training and Research Texas Southern University 3100 Cleburne Houston, Texas 77004	11. Contract or Grant No. DTRS07-G-0006

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
Southwest Region University Transportation Center Texas A&M Transportation Institute Texas A&M University System College Station, Texas 77843-3135	14. Sponsoring Agency Code

15. Supplementary Notes

Supported by a grant from the U.S. Department of Transportation, University Transportation Centers Program.

16. Abstract

An area of growing dialog among transportation professionals is about megaregions and the affect the concept may have on long range travel demand and the movement of goods and people throughout a state or region. Megaregion connotes that an individual urban area does not operate singly, but in concert with other urban and rural areas as a comprehensive unit providing and attracting goods and services for the world. As these complex mobility arrangements occur, planning entities are continuing to conduct more localized scaled activities for their independent urban and rural areas. Key questions should be asked about whether another planning layer should be added that examines the megaregions and investigates the interrelationships to determine if advantages or efficiencies might be available by considering operation of the complex whole as one unit. Clearly, such an assessment would not negate the smaller, local level planning activities, but may offer the potential to more competitively posture a megaregion in line with the other 40 or so world megaregions. This work convened a workshop addressing that planning concept. Workshop participants agreed that planning for the megaregions should be added to the elements included in long range plan development.

17. Key Words	18. Distribution Statement
Megaregions, Regional Planning	No restrictions. This document is available to the public through NTIS: National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161

19. Security Classif.(of this report)	20. Security Classif.(of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	63	

Form DOT F 1700.7 (8-72) **Reproduction of completed page authorized**

Moving the Concept of Megaregions into Transportation Planning: Workshop Proceedings

by

Carol Abel Lewis, Ph.D.
Sara Land, Graduate Student Researcher
Bethelhem Afefayane, Graduate Student Researcher

Research Report SWUTC/12/476660-00051

Southwest Region University Transportation Center
Center for Transportation Training and Research
Texas Southern University
3100 Cleburne
Houston, Texas 77004

August 2012

ABSTRACT

An area of growing dialog among transportation professionals is megaregions and the affect the concept may have on long range travel demand and the movement of goods and people throughout a state or region. Megaregions is the notion that individual urban areas do not operate singly, but in concert with other urban and rural areas as a comprehensive unit providing and attracting goods and services for the world. As these complex mobility arrangements occur, planning entities are continuing to conduct more localized scaled activities for their independent urban and rural areas. Key questions should be asked about whether another planning layer should be added that examines the megaregions and investigates the interrelationships to determine if advantages or efficiencies might be available by considering operation of the complex whole as one unit. Clearly, such an assessment would not negate the smaller, local level planning activities, but may offer the potential to more competitively posture a megaregion in line with the other 40 or so world megaregions. This work convened a workshop addressing that planning concept. Workshop participants agreed that planning for the megaregions should be added to the elements included in long range plan development.

EXECUTIVE SUMMARY

Texas Southern University's Center for Transportation Training and Research invited 20 transportation professionals and academics to consider establishing an agenda for discussing the concept of the megaregion in Texas. Widespread interest in megaregions exists across the world, as historical urban area boundaries fade and proximate major urban centers begin to function as a unit and in tandem. For Texas, the regions including and surrounding Houston, Dallas/Fort Worth, Austin and San Antonio form the core of the Texas megaregion, often termed the Texas Triangle. University of Texas' Center for Transportation Research served as host site for the event; SWUTC Director Dock Burke provided opening comments and set the stage for the day's discussion. Attendees considered components of on-going megaregions' research as follows:

- Carol Lewis (TSU CTTR) presented preliminary data about existing travel statistics between Houston, Dallas, San Antonio, and Austin,
- Ming Zhang (UT CTR) discussed megaregions from an international perspective,
- David Crossley (Houston Tomorrow) updated the attendees about US megaregions' activities, and
- Rob Harrison (UT CTR) spoke about the freight aspects of megaregions.
- Representatives of the metropolitan planning organizations provided their perspective of megaregions' planning.
- Breakout sessions were geared to in-depth dialog of four questions.

The foundational question for the breakout sessions was whether megaregions should be included as a continuing component in long range plan updates by the metropolitan planning organizations and state. If yes, subsequent questions were what planning activities should be covered, what entity should conduct megaregions' planning, and how priorities should be set concerning the many issues in planning for the megaregion.

Consensus from the breakout sessions concluded that planning should occur for Texas' megaregion. From the transportation vantage point, TxDOT is best suited to conduct the planning, but MPOs are important contributors. Federal guidance for MPOs limits their authority to consider matters outside their boundaries, so how cross-regional connectivity occurs at their boundaries will be important. Attendees advised that future megaregion discussions include private sector stakeholders working in all the urban areas.

Dialog should occur about adding other Texas areas to the Megaregion and perhaps changing the nomenclature from the Texas Triangle to a Texas Diamond, if locations in the valley regions of the state are connected. Attendees are also interested in how the rural areas of the state and West Texas communities are linked to the megaregion. Clearly, the workshop formed the first level discussion and much deliberation and many decisions are still to come.

TABLE OF CONTENTS

DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the information presented herein. This document is disseminated under the sponsorship of the U.S. Department of Transportation, University Transportation Centers Program, in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof.

Notice

Mention of trade names or commercial products does not constitute endorsement of recommendation for use. Trade and manufacturers' names appear herein solely because they are considered essential to the object of this report.

ACKNOWLEDGEMENTS

The authors recognize that support for this research was provided by a grant from the US Department of Transportation, University Transportation Centers Program to the Southwest Region University Transportation Center.

We appreciate the contributions of all presenters and workshop participants.

INTRODUCTION

An area of growing dialog among transportation professionals is about megaregions and the affect the concept may have on long range travel demand and the movement of goods throughout the state. Megaregions is the notion that individual urban areas do not operate singly, but in concert with other urban and rural areas as a comprehensive unit providing and attracting goods and services for the world. As these complex mobility arrangements occur, planning entities are continuing to conduct more localized scaled activities for their independent urban and rural areas. Key questions should be asked about whether another planning layer should be added that examines the megaregions and investigates the interrelationships to determine if advantages or efficiencies might be available by considering operation of the complex whole as one unit. Clearly, such an assessment would not negate the smaller, local level planning activities, but may offer the potential to more competitively posture a megaregion in line with the other 40 or so world megaregions.

The transportation planning process is well understood and formalized in major metropolitan areas across the country. A regional long range plan covering 25 to 30 years is developed by the metropolitan planning organization with input from citizens and agencies within its geographic purview. Once a project is included in the long range plan, eligible transit, roadway and other organizations may submit their project to be ranked compared with other projects for inclusion in the three-year or one-year funded projects list. The ranking and funding of projects is based on a variety of criteria compiled to improve mobility and air quality within the regions. Not included in the list of considerations are interregional criteria which would look at the broader linkages and opportunities perhaps available by considering more than one metropolitan area in tandem. This research poses to examine the question of whether and how the current planning process should be modified to consider mobility questions on an interregional basis, covering large portions of the state of Texas.

With the globalization and technological phenomena, traditional lines of mobility are growing. Home to work trips may occur from one city to another with workers traveling one or two days per week and working from home other days. Freight and logistics shipments frequently travel the interstate highways and railroads distributing goods to desired locales. One megaregion organization described the historical representation of municipalities and governing units as *blurring* (America 2050). Texans have spoken of these travel patterns for at least a decade, with nomenclature of the *Texas Triangle* describing key areas of commerce that need to be interconnected. Much discussion is around high-speed rail to connect the Triangle metropolitan areas. In fact, some Texans have argued that accommodating projected growth in population and trade, the Triangle should take a megaregion approach for coordinated transportation and land-use planning. They also write that Texas law is not structured to accommodate the megaregion approach to addressing what should be Texas' strategy to best meet global needs and compete in the market against other megaregions.

Megaregions are geographic areas that will contain two-thirds of the nation's population by 2050 and will be identified partly through environmental, economic, cultural, and infrastructure relationships (Amekudzi et. al., 2007). They can be understood as networks of metropolitan centers and their surrounding areas, connected by existing environmental, economic, cultural,

and infrastructure relationships. As economic drivers, megaregions will continue to attract new populations and require new investments in infrastructure and greater focus on environmental preservation, including climate change. Zhang et al. (2007) write that economic and social relationships now occur at the megaregion scale irrespective of the boundary lines drawn by local, regional or state government. Currently published studies suggest the existence of as many as ten megaregions, all including multiple cities and many cross state borders. In the United States, *America 2050* shows the Houston area in two megaregions, the well discussed Texas Triangle and a more crescent shaped center anchored by Corpus Christie and New Orleans along the Gulf Coast.

There are a number of implications about megaregions that warrant this discussion. Ross (retrieved 8/19/09) notes congestion is affected because the reliance on trucking is higher in megaregions than non-megaregions. Negative economic impacts may ensue increasing the costs and complicating schedules. For these reasons a discussion of how Texas will approach the topic of megaregions in regional transportation planning is in order.

Principal Research Question and Objectives

The goal of this research is to aggregate the academic and planning communities in Texas to discuss the idea of the megaregion in our State with a focus on the planning process and whether and how the process should accommodate the idea of a megaregion community. Specifically, the objectives are to:

- Begin a structured dialog among the planning community and academics about the megaregion concept in Texas.
- Identify points in the planning process where megaregion considerations should enter discussion.
- Establish a framework whereby this discussion and process changes can occur when identified.

Is there a need to conduct a megaregional planning activity for an area of Texas (e.g., the Texas Triangle) and if so, how would that planning activity be structured?

BACKGROUND

Megaregions unite metropolitan cities experiencing continued expansion and growth beyond their original boundaries or city limits. As boundaries blur, this creates a new scale of geography. The United States population is growing rapidly and there are problems associated with this growth such as inadequate policies and insufficient infrastructure to handle such growth. It is estimated that population in the United States will increase by an additional 130 million residents in 2050 (America 2050.org, 2009). Each of the country's eleven identified megaregions has a unique make-up. It is the interrelationships among the cities and states that define commonalities and linkages. The eleven regions, broken down by a generalized proximity are as follows:

- The Arizona Sun Corridor
- Cascadia in the upper northwest portion of the country
- The Texas Triangle, Gulf Coast which includes Houston, Texas,
    - The crescent connecting Houston with New Orleans along the Gulf Coast, thus making the city a part of two megaregions
- Great Lakes
- Northeast
- Northern California
- Piedmont-Atlantic which covers the area from northern Alabama to northwest North Carolina
- Front Range sprawling across Denver and into northern New Mexico
- Florida
- Southern California

Ideally, megaregions will form connectivity between major and smaller surrounding cities through consensus around elements of economics, environment, and energy utilization. One element could contain a unified infrastructure plan. From the transportation perspective, regions might encourage intermodal transportation system development leading to reduced highway and air traffic congestion. Modernizing transportation systems and improving connectivity between regions will support transit ridership and contribute to sustainability when proximate to jobs, stores, and public parks (CQGRD, 2006). President Barack Obama announced and Congress passed the 2009 American Recovery and Reinvestment Act, which, in part, provided an eight billion dollar economic stimulus to develop a national high speed rail transportation system. These intrastate facilities will provide residents and business travelers with options when moving between areas. Maintaining green space and natural systems from a conservation perspective is still another objective of a megaregion. Green infrastructure networks connect people to the natural world, promoting well-being for neighborhoods and the people who reside in them (Ross, 2008).

Houston Tomorrow 2009 Megaregion Conference

There are a plethora of non-profit associations advocating improved transportation systems locally and nationally. In September, 2009, one such organization, Houston Tomorrow, sponsored a Megaregions conference for the state of Texas incorporating aspects of the Texas

Triangle focusing on Dallas-Fort Worth, Austin, San Antonio, and Houston. Topics of conversation and presentation included high speed rail transportation between the major Texas cities with focus on challenges to specific regions as well as the opportunities available for development. Elected officials from across the state attended. One particular panel hosted Ed Emmett, the Harris County Judge. Emmett gave opinions on preparing Texas for high speed rail. Other panel members included Ben White, Mayor of College Station; Jungus Jordan, a Fort Worth city council member; and Sarah Eckhardt, Travis County Commissioner. All agreed that the state should be more assertive in planning for the future of transportation modernization. They also agreed that funding for such a future would be astronomical, and concurred that further discussion is needed concerning oversight and sources of funding. Each panelist suggested beginning with small changes geared toward commuter rail. It was suggested by Eckhardt that starting with commuter rail could evolve into high speed rail in years to come.

Many planners and policymakers face issues and challenges associated with growth management nationally. In Texas, there is valuable farmland in between cities where high speed rail is proposed, but there is an issue regarding the use of land and water availability (Neuman, 2008). Those who oppose high speed rail are concerned that water may be a scarcity if and when the rails are built, cutting off the essential supply to rural farms and communities. There is a lack of policy infrastructure across the board; however, there are plenty of visions and ideas about improving the current transportation system. The lack of multi-jurisdictional uniformity has affected how the entire operation will be implemented and developed. Making the vision of a megaregional rail system a reality has been difficult because of political affiliations with many policymakers and elected officials, thus few have established a common ground for planning and development. Funding is perhaps one of the largest issues facing all of the megaregions. Sarah Eckhardt made the suggestion of funding through taxation for Texas. One panelist suggested that the Texas Department of Transportation be a stakeholder in designing and implementing a basic framework for megaregional transportation development.

Additional Considerations

Creating a state of the art rail system that connects inter-modally, but ends up neglecting neighborhoods outside of major cities and some rural areas is also a concern (Fainstein, 2009). An issue of neglect may make these areas the new slums. For instance, sprawling, as it is defined, may be a concern for commuter rails in Houston. The city has no zoning laws and developers are free to build as they see fit and much resistance is shown by them to reducing sprawl. Houston is a sprawling city. Light rail is on its way to better connect parts of the inner portions of the city, but neighborhoods beyond the core are challenged with connectivity via rail; connections by express bus service are available. The focus is shifting in some American households from suburban living to urban living (Fainstein, 2009). With the improvement of inner city living and the amenities of public transportation within a given area, the value of the area goes up. There is an issue of gentrification, long time residents feel forced from their property by new residents. The price also increases for residents who have lived in the same area for years, leaving them to struggle with higher property taxes. Priority action for megaregion development should rest with the respective city and state officials. There must be a consensus or at least policy makers must realize that the vision for development and collaboration is essential.

WORKSHOP FINDINGS

Megaregions Workshop-November 1, 2010

Professionals and academicians met to discuss the concept of the megaregion at Texas Southern University's Center for Transportation Training and Research's Megaregions' Workshop held in Austin, Texas, November 2010. For Texas, the Texas Triangle, the regions including and surrounding Houston, Dallas/Fort Worth, Austin and San Antonio, form the core of the generally discussed Texas megaregion.

The workshop began with a foundation for discussion through presentations of four perspectives followed by comments from representatives of the metropolitan planning organizations (MPOs) representing the largest cities. Focal areas are as follows:

- Carol Lewis (Texas Southern University, Center for Transportation Training and Research) presented preliminary data about existing travel statistics between Houston, Dallas, San Antonio, and Austin (Appendix 1),
- Ming Zhang (University of Texas, Center for Transportation Research) discussed megaregions from an international perspective (Appendix 2),
- David Crossley (Houston Tomorrow) updated the attendees about US megaregions activities (Appendix 3), and
- Rob Harrison (University of Texas, Center for Transportation Research) spoke about the freight aspects of a megaregion (Appendix 4).
- Two representatives of metropolitan planning organizations provided their perspectives about megaregions' planning

Consensus: Breakout Sessions and Responses to Questions

Attendees formed three groups for breakout sessions geared to in-depth dialog of the following questions:

- Whether megaregion planning should be incorporated into regional transportation planning?
- What planning activities should be included?
- What should be incorporated?
- What should be the priority?

Each question is presented below with the consensus responses from the table participants shown beneath.

1) **Whether megaregion planning should be incorporated into regional transportation planning.**

- Megaregional planning should be incorporated into regional planning activities but concerns in implementation include:
    - Leadership (Who would champion the megaregion and what agency could take the premier role in moving the concept forward?)
    - Regulatory environment
    - Division of funding
    - Scale
    - Data & Information

- The question was asked as to whether and how we can conduct real megaregion planning. MPOs are prohibited legally from planning outside their boundaries. In the best scenario, federal and state presence would be key for megaregion planning to occur.
- Megaregions definition does not fit existing federal laws and requirements.
- A coordinated effort on the Federal level is needed to facilitate infrastructure improvements that would enhance transportation for the megaregion.

2) What planning activities should be included?

Attendees agreed on the elements listed below as areas to be included in megaregions planning.

- "Texas Diamond" Add Laredo!
- Freight planning
- Education
- Air quality
- Transportation
- Network aspects: Air/Highway
- Land use
- Economic development
- Agriculture
- Airlines
- High Speed Rail
- Water
- Compacts
- Interlocal agreements
- Champions
- Visioning
- Non-road development
- Fixed definition of megaregion in Texas
- Role of private sectors

3) What should be incorporated?

Responses below indicate a starting point, but recognize the list is more extensive than shown.

- Regional business (with a focus on Dallas to Houston)
- Reduced short-haul flights
- Austin is expected to reach non-attainment status in an air quality category, which will have implications for vehicle travel in single occupant automobiles.
    - 80% of Texas' population projected to be in the megaregion.
    - Coalition of Councils of Governments (COG), Texas Council on Environmental Quality
- Catalog what's happening?
    - Document planning and relevant regulatory actions across state.
    - Develop list of existing corridor organizations.
- Infrastructure (water, electric, wastewater, transit, road, rail) should overall be the starting point, due to the fact that we already have processes and channels to make changes in these areas.
- Air quality issues can be used as a catalyst to bring parties to the table, as air quality represents an actual threat, (needed to jumpstart the political process) and will affect a wide array of stakeholders in the economy of the state.
- Texas Triangle Chamber of Commerce
    - Focus on markets
    - Focus on efficiency
    - See competition as coming from other megaregions
    - Stress cooperative action based on Return on Investment
- Initiate a Texas Triangle Megapolitan Organization
    - Politically organized around 66 counties of the Texas Triangle
    - Think long term about a "Local option" Taxing Authority
- Texas Non-Attainment Triangle
    - Air
    - Water
    - Open space/Agriculture/Parks
- Texas Triangle Infrastructure Commission
    - Transportation: Highway, rail, air, water
    - Utilities: Power, water, communication
    - Housing
    - Green Infrastructure

4) What should be the priority?

- Megaregional statewide LRP
- (Education) Development and publish research report
- Pull in agencies/industries that have a statewide perspective to their business: HEB (Grocery Chain), CSX, Frito-Lay
- Follow through on whether there is interest in a Smart Growth Bill (Resurrection)

Independent Table Discussion Summary

Perspectives from participants are summarized per table below.

Table 1

- MPOs are suited to take on megaregional challenge, but are not created for that purpose.
- MPOs need to focus on more than transportation; must expand beyond.
- Many satellite areas not within Dallas Fort Worth have tangible relationships that are not seen. In a way, that area is a mini-megaregion.
- Envision North Texas's focus on green space. Now they are looking at it as Sprawl vs. TOD. Difficulties (education) have made it difficult to find people affordable housing, environmental education that's business located. People look at TOD much as "save the green space" vs. "save the green space and how are we going to have 100,000 people going to live near it?"
- Role of planning should be re-evaluated and possibly changed. Many COGs and MPOs are already incorporating megaregions at least on a smaller scale.
- There are two major level's of planning. The first is to be sure that we have the "survival infrastructure" and the second is the social side, how to make it nice place.
- Redefine what MPOs were designed for? In megaregion planning, MPOs are beyond transportation planning. It includes education, economics and cultural.
- By increasing connectivity between cities, we need to keep in mind that we may generate extra (new) trips due to increase in accessibility and eventually lower cost.
- Since there are few federal directions relating to planning and MPOs, Texas needs a strong state framework for megaregional planning.

Table 2

- The key is to change the State Enabling Act to allow a way to give these authorities the ability to mandate.
- The first justification for any transportation project is need and we need to take that approach with megaregions. We also should look more closely at multiplying uses in right of ways.
- Think about coalition of COGs as a governance structure. Also, we may want to look at megaregion planning incrementally in order to keep things moving and prevent stagnation.
- We should frame this in the context of economic growth. "We all win when anyone in the Texas Triangle (or diamond) wins".
- What do we have in common? So many regional problems especially funding; how do we go to megaregion planning?

Table 3

- We need to convey what megaregions mean to ordinary people. How does this improve quality of life for all of us? It is important that we frame it to be successful there.
- Rules don't allow external planning; scale is local.
- It makes sense to connecting the dots; economy, neighborhood, etc. But what is lost and gained by connecting them?

- Issues related to population movement; as the built infrastructure is static! How do we pick that right point and time?
- Do we need separate entities?
    - Who should be on board for megaregion planning?
    - Quality of life issues.
    - Future commuting decisions; commuting trend is one core thing to delineate megaregion.
- Role of private sectors in megaregion planning; they benefit from building (contributors) and providing (material, service etc)

WORKSHOP SUMMARY

This research has begun reviewing the complexities of megaregions; there remains much to be analyzed. Depth is needed on aspects of megaregions including high speed rail. Greater knowledge would be valuable, but is not limited to the elements listed below.

- Sources regarding freight movement locally and regionally through megaregions,
- Research on suburbs and the potential effects of megaregions
- Linkages with public transportation systems and ridership in Texas.
- Identification of management tools appropriate for implementing long range plans of states involved in megaregion development.
- Inclusion of the private sector, especially entities with statewide business interests
- Additional attention to the bureaucratic complexities framed by state and federal guidelines and jurisdictional boundaries.

Although a megaregion is far more than a transportation concept, the attendees largely represented transportation entities, so the responses may have leaned towards transportation. Based on agreement that megaregions should be included as a continuing component in long range plan updates by the metropolitan planning organizations and state, subsequent questions were discussed including: what planning activities should be covered, what entity should conduct megaregions' planning, and how priorities should be set concerning the many issues in planning for the megaregion.

From the transportation vantage point, the consensus from the breakout sessions concluded that planning should occur for Texas' megaregions through TxDOT, which is best suited to conduct the planning while keeping in mind that MPOs are important contributors. Because federal guidance for MPOs limits their authority to consider matters outside their boundaries, it will be important as to how cross-regional connectivity occurs at their boundaries. Workshop participants suggested that private sector stakeholders working in all the urban areas be included in future megaregion discussions.

Adding other Texas regions to the megaregion and perhaps changing the nomenclature from the Texas Triangle to a Texas Diamond, if valley regions are connected, was suggested as future dialog. Another key concern was how the rural areas of the state and West Texas communities will be linked to the megaregion. Much deliberation and many decisions are still to come, however, the workshop formed the first level of aggregating the academic and planning communities in Texas to discuss how to accommodate the idea of megaregions in the planning processes.

REFERENCES

Amekudzi, Thomas-Mobley & Ross (2007) Amekudzi, A., L. Thomas-Mobley & C. Ross. 2007. **Transportation Planning and Infrastructure Delivery in Major Cities and Megacities.** *Transportation Research Record*, 17-23.

America 2050. **Megaregions**, http://www.america2050.org/megaregions.html, retrieved 8/20/09

Ankner, William. Meyer, Michael. 2009. Investing In Megaregion Transportation Systems: Institutional Challenges and Opportunities. Megaregions (pp. 166-190) Washington, DC: Island Press.

CAMPO and TX-DoT. 2008. Austin Area freight Transportation Study. Executive Summary Report. Retrieved from: http://www.campotexas.org/pdfs/AustinFreightExecSumW.pdf

Center for Quality Growth & Regional Development. 2006. Megaregions: Studying the Southeastern United States. Retrieved from: http://smartech.gatech.edu/bitstream/1853/13128/1/PAM_overview_1-3-06.pdf

Fainstein, Norman. Fainstein, Susan S. 2009. Social Equity and the Challenges of Distressed Places. Megaregions (pp. 191-215) Washington, DC: Island Press.

Federal Highway Administration. 2009. Traffic (Vehicle) Volume Trends of the United States. Retrieved from: http://www.fhwa.dot.gov/ohim/tvtw/09martvt/09martvt.pdf

Federal Highway Administration. 2002. Megaregions: Literature Review of the Implications for U.S. Infrastructure Investment and Transportation Planning. Section II. Foundations and Methods of Delineation. B. Megaregions and Infrastructure. Retrieved from: http://www.fhwa.dot.gov/planning/megaregions3.htm

Florida, Richard . Mellander, Charlotta. Gulden. Tim. 2009. Global Metropolis: The Role of Cities and Metropolitan Areas in the Global Community. Retrieved from: http://www.creativeclass.com/rfcgdb/articles/Global%20metropolis.pdf

Houston-Galveston Area Council. 2003. Appendix D: Freight Goods Movement-Houston Region Freight Transportation Profile. Retrieved from: http://www.hgac.com/taq/plan/documents/2035_final/Appendix%20D-Freight%20and%20Goods%20Movement%20.pdf

Neuman, Michael. Bright, Elise. 2008. Texas Urban Triangle: Framework for Future Growth. Retrieved from: http://swutc.tamu.edu/publications/technicalreports/167166-1full.pdf

Rodrigue, Jean-Paul. 2003. Freight, Gateways and Mega-Urban Regions: The Logistical Integration of the Bost-Wash Corridor.

Ross, Dr. Catherine L. 2008. Megaregions: Literature Review of the Implications for U.S. Infrastructure Investment & Transportation Planning. Retrieved from: http://www.fhwa.dot.gov/planning/megaregions.pdf

Ross, Catherine. Barringer, Joan. Amekudzi, Adjo. 2009. Mobility in the Megaregion. Megaregions (pp. 140-165) Washington, DC: Island Press.

Texas Department of Transportation. 2009. District and County Statistics for the State of Texas. Retrieved from: http://www.txdot.gov/apps/discos/default.htm

San Antonio-Bexar County MPO. 2009. Mobility 2035:Chapter 8.Freight Movement in San Antonio. Retrieved from: http://www.sametroplan.org/Plans/MTP/Mobility2035/8%20Freight%20significantly%20revised.pdf

Zhang, Ming. Steiner, Frederick. Butler, Kent. 2007. Connecting the Texas Triangle: Economic Integration and Transportation Coordination. Retrieved from: http://www.america2050.org/Healdsburg_Texas_pp_21-36.pdf

Zhang, Ming and Chen, Binbin. 2009. Future Travel Demand & Its Implications for Transportation Infrastructure Investments in the Texas Triangle. Retrieved from: http://swutc.tamu.edu/publications/technicalreports/167276-1.pdf

APPENDIX 1

Preliminary Data about Existing Travel Statistics between Houston, Dallas, San Antonio, and Austin (Carol Lewis; TSU CTTR)

Purpose of Workshop

- **To aggregate the academic and planning communities in Texas to discuss:**
  - **How to accommodate the idea of megaregions in the planning processes**

Specific Objectives of Workshop

- **Begin structured dialog**
- **Identify points in the planning process**
- **Establish a framework**

Workshop Agenda

11:00 a.m.	**Opening session**
12:15 p.m.	**Lunch**
1:00 p.m.	**Breakout 1: Workshop discussion questions**
2:15 p.m.	**Break**
2:30 p.m.	**Breakout 2: Workshop discussion questions**
4:00 p.m.	**Adjourn**

What Exactly is a Megaregion?

- **Networks of metropolitan regions with shared**
  - **Economies**
  - **Infrastructure**
  - **Natural resource systems**
- **Stretching over distances of roughly 300 miles - 600 miles in length**

Source: Hagler & Todorovich, 2009

Megaregions

- **Will form connectivity between major and smaller surrounding cities through:**

Economics

Environment

Energy utilization

Megaregions …

- Operate—and thrive—at the center of a new
  - Planning,
  - Economic,
  - Geographic
  - Scale

Source: fhwa.dot.gov, 2010

Need for Megaregions

- **Megaregions have been introduced as:**
  - **A new framework for national spatial development policies**

Source: Ross, 2009

Why do we need planning at larger scale?

- **To define regionalism that captures**
  - **Economic**
  - **Political**
  - **Spatial level**
- **To respond to the challenges of agglomerations**
  - **Economic activity**
  - **Population**

Source: fhwa.dot.gov, 2010

TEXAS TRIANGLE

Location: Eastern Texas

Principal Cities: Austin, Dallas/Fort Worth, Houston, San Antonio

Population 2000: 16,131,347

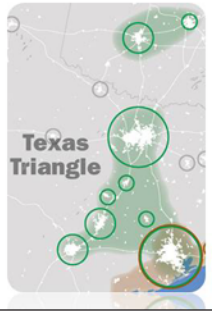
Percent of U.S. Population 6%

Population 2025: 23,586,856

Projected Growth: 46%

2005 GDP: $817,510,000,000

Percent of US GDP: 7%



Texas Triangle

- Major industries in the Texas Triangle Megaregion include:
  - Energy and natural Resources
  - Construction
  - Semiconductors and
  - Software and Information Technology

Source: fhwa.dot.gov, 2010

Megaregions and Transportation

- **Emerging new pressures on national transportation systems**

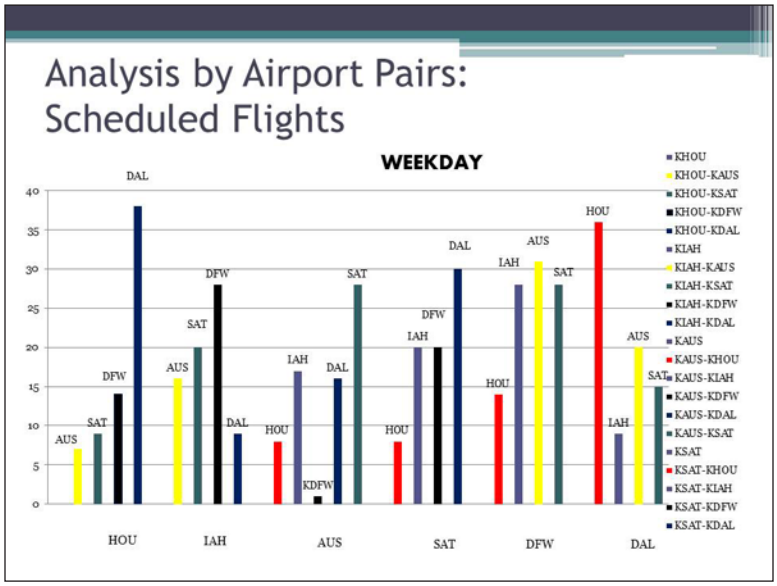
- **Global trends**
- **Economic markets**
- **International trade**

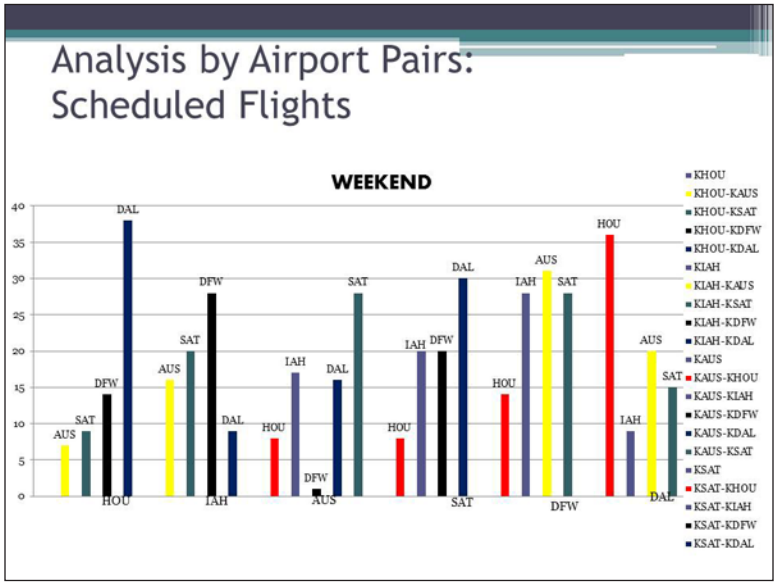
Source: fhwa.dot.gov, 2010 & Ross, 2009

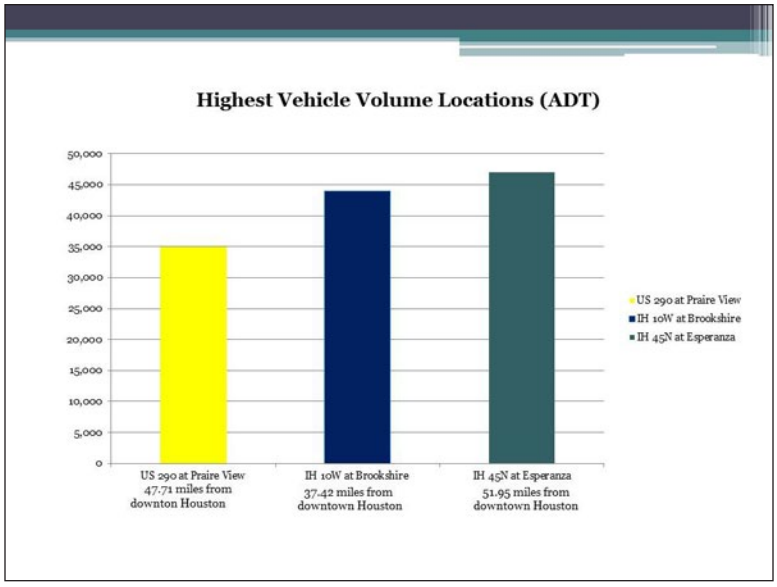
Megaregions and Transportation …

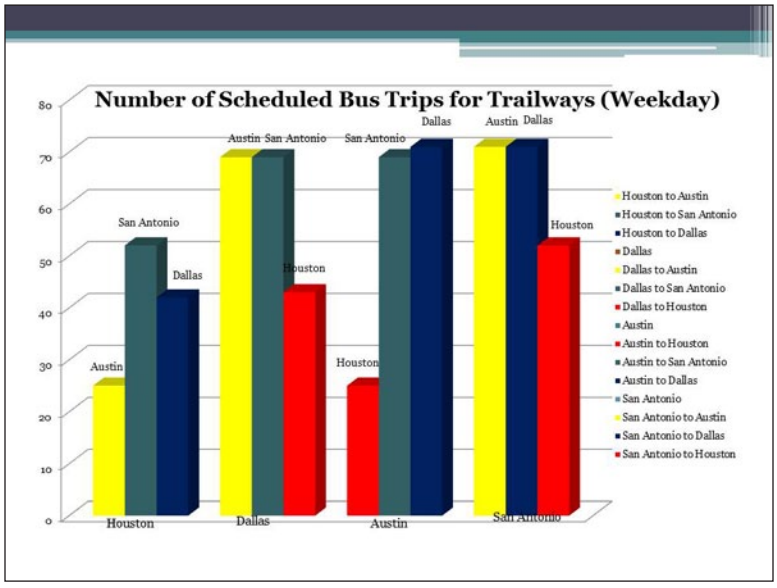
- **Investment in transportation connectivity**
- **is important**

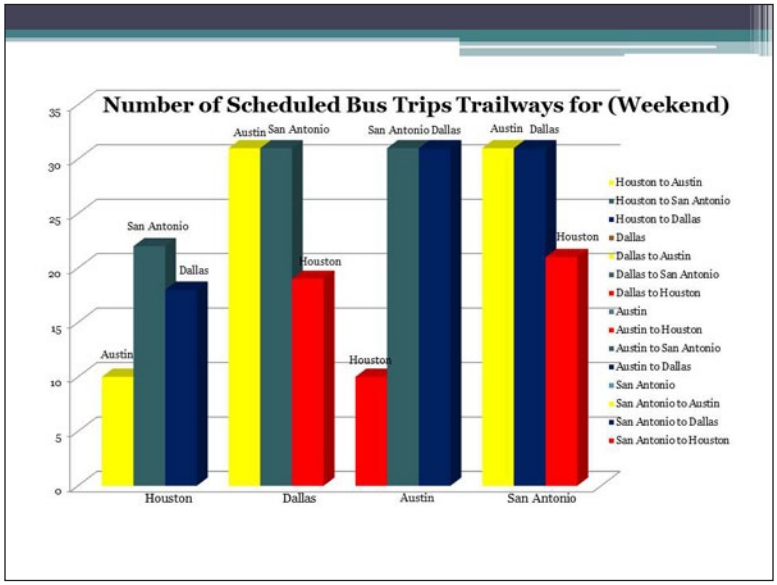
Source: Ross, 2009


Analysis by Airport Pairs:
Scheduled Flights
WEEKDAY
HOU
IAH
AUS
SAT
DFW
DAL
KHOU
KHOU-KAUS
KHOU-KSAT
KHOU-KDFW
KHOU-KDAL
KIAH
KIAH-KAUS
KIAH-KSAT
KIAH-KDFW
KIAH-KDAL
KAUS
KAUS-KHOU
KAUS-KIAH
KAUS-KDFW
KAUS-KDAL
KAUS-KSAT
KSAT
KSAT-KHOU
KSAT-KIAH
KSAT-KDFW
KSAT-KDAL


Analysis by Airport Pairs:
Scheduled Flights
WEEKEND
HOU
IAH
AUS
DFW
SAT
DAL
KHOU
KHOU-KAUS
KHOU-KSAT
KHOU-KDFW
KHOU-KDAL
KIAH
KIAH-KAUS
KIAH-KSAT
KIAH-KDFW
KIAH-KDAL
KAUS
KAUS-KHOU
KAUS-KIAH
KAUS-KDFW
KAUS-KDAL
KAUS-KSAT
KSAT
KSAT-KHOU
KSAT-KIAH
KSAT-KDFW
KSAT-KDAL


Highest Vehicle Volume Locations (ADT)
US 290 at Praire View
47.71 miles from
downton Houston
IH 10W at Brookshire
37.42 miles from
downtown Houston
IH 45N at Esperanza
51.95 miles from
downtown Houston
US 290 at Praire View
IH 10W at Brookshire
IH 45N at Esperanza

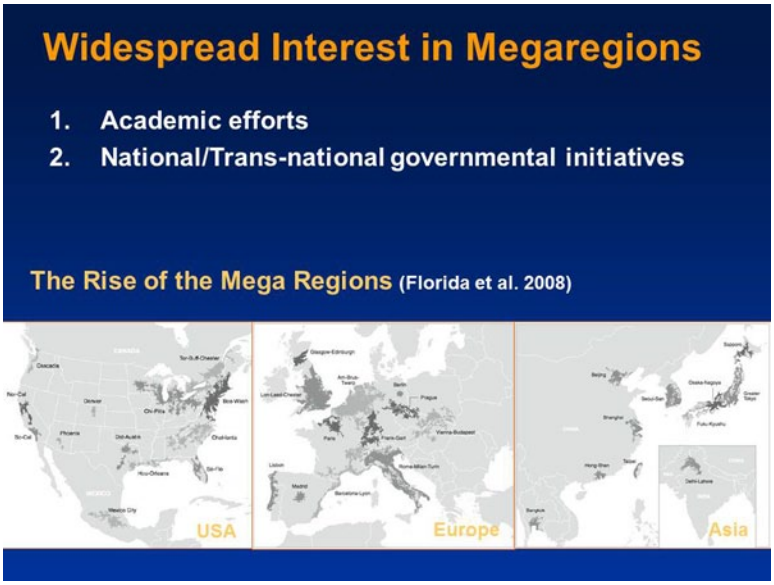

Number of Scheduled Bus Trips for Trailways (Weekday)
80
70
60
50
40
30
20
10
0
Austin
San Antonio
Dallas
Houston
Austin
San Antonio
Houston
Houston
Dallas
San Antonio
Austin
Dallas
Austin
Dallas
Houston
Houston to Austin
Houston to San Antonio
Houston to Dallas
Dallas
Dallas to Austin
Dallas to San Antonio
Dallas to Houston
Austin
Austin to Houston
Austin to San Antonio
Austin to Dallas
San Antonio
San Antonio to Austin
San Antonio to Dallas
San Antonio to Houston


Number of Scheduled Bus Trips Trailways for (Weekend)
35
30
25
20
15
10
5
0
Austin
San Antonio
Dallas
Houston
Austin
San Antonio
Houston
Houston
San Antonio
Dallas
Austin
Dallas
Houston
Houston to Austin
Houston to San Antonio
Houston to Dallas
Dallas
Dallas to Austin
Dallas to San Antonio
Dallas to Houston
Austin
Austin to Houston
Austin to San Antonio
Austin to Dallas
San Antonio
San Antonio to Austin
San Antonio to Dallas
San Antonio to Houston


Megaregions …
• Provide a strategy to position globally, while addressing local quality-of-life issues
• Represent an opportunity for the United States
• to create regionally cooperative efforts
Source: fhwa.dot.gov, 2010

APPENDIX 2

Megaregions from an International Perspective (Ming Zhang: UT CTR)



1. Academic Efforts

Three frameworks summarizing ways to define region

Framework #1:

Bounded jurisdictions for "space of places"

Framework #2:

Gradient "space of influence" (environment, culture, economy)

Framework #3:

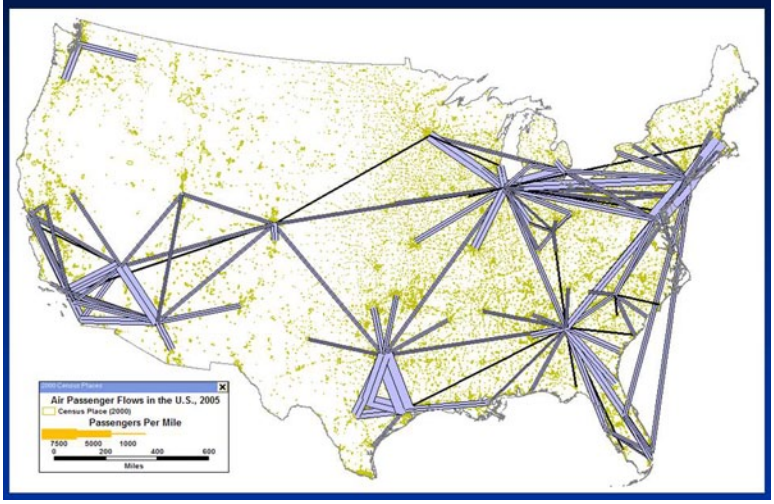
Graph linkage measuring "space of flows"

(Dewar & Epstein 2007)

Framework #1: Focus on "space of places"

Framework #2: Focus on "space of influence"

Framework #3: Focus on "space of flows"



Different Focus, Different Megaregion Delineation

Europe:	Asia/China:	U.S.A.:
Flow and Influence	Place and Influence	Influence and Place

Identify/Analyze megaregion

- Common conceptual origin: *Megalopolis* (Gottman 1964)
- Methodological / practical challenges

In the U.S.
- 8-10 megas by RPA (2005)
- 10 by Lang and Dhavale (2005)

In Europe
- 12 megas by Florida et al (2008)
- 8 mega city-region by Hall and Pain (2005)

In China
- 10 megas by Xiao & Yuan of NDRC (2007)
- 18 by SJTU (2007, 2008)
- 20 by Wang (2007)

Terminology:

"megaregion" as a general expression referring to various terms appearing in the literature, e.g., mega city-region, urban cluster, urban ring, city-region, megalopolitan, global city, world city

2. National / Trans-national initiatives

"European Spatial Development Perspective"
-- European Commission, 1999

Key Concepts:

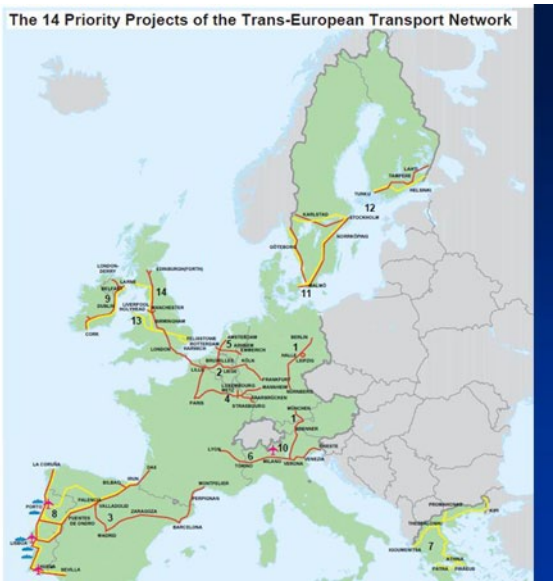
- Territorial cohesion
- Balanced sustainable spatial development

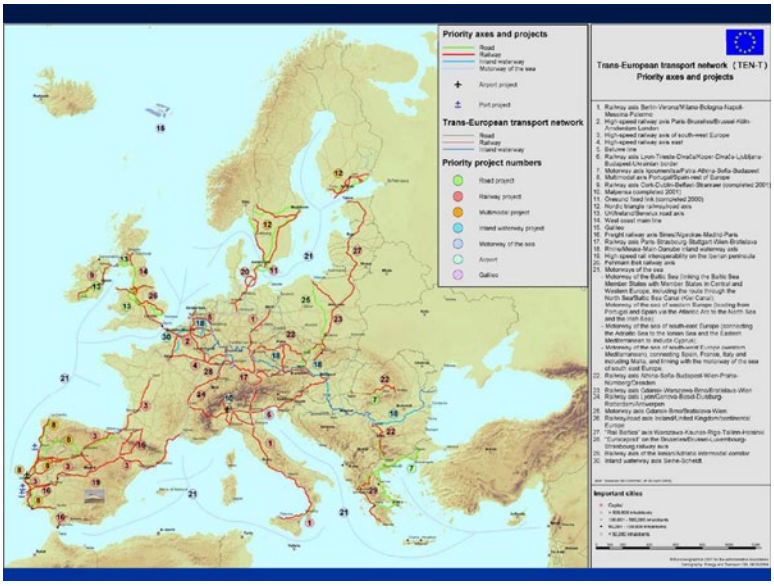
1. High-Speed Train/ Combined Transport North-South
2. High-Speed Train PBKAL
3. High-Speed Train South
4. High-Speed Train East
5. Benelux-Line: Conventional rail/ Combined Transport
6. High-Speed Train/ Combined Transport France-Italy
7. Greek Motorways Pathe und Via Egnatia
8. Multimodal Link Portugal-Spain-Central Europe
9. Conventional rail Cork-Dublin-Belfast-Larne-Stranraer
10. Malpensa Airport, Milano
11. Øresund Fixed rail/road Link Denmark-Sweden
12. Nordic Triangle Multimodal Corridor
13. Ireland/United Kingdom/Benelux road link
14. West Coast Main Line

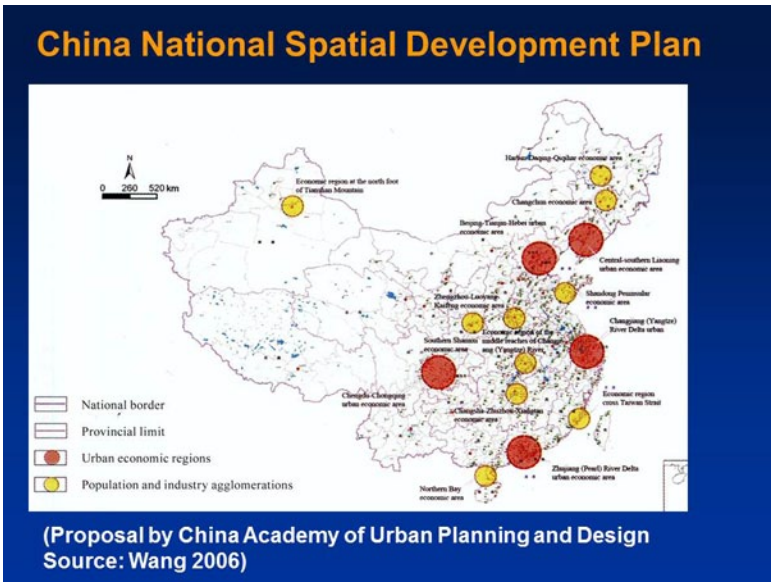
Rail
Road
Airport
Harbour

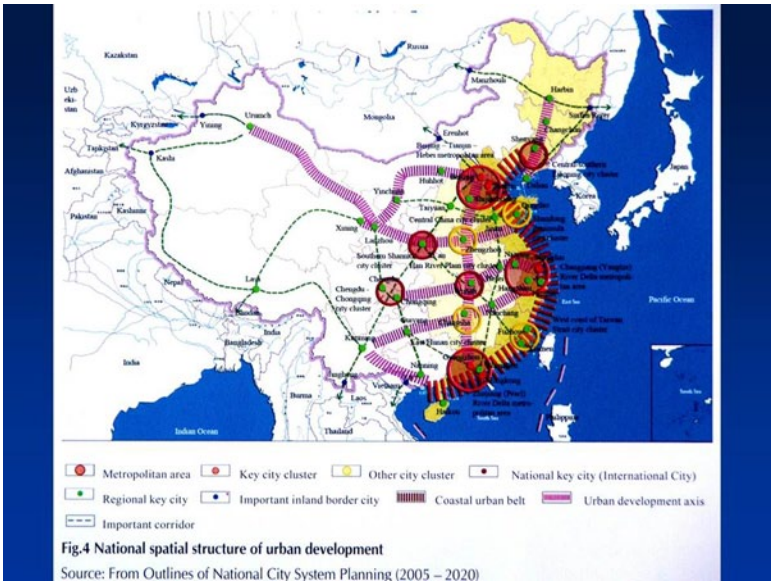
Source: European Commission GD VII

Açores (P)
Madeira (P)
Canarias (E)
Guadeloupe (F)
Martinique (F)
La Réunion (F)



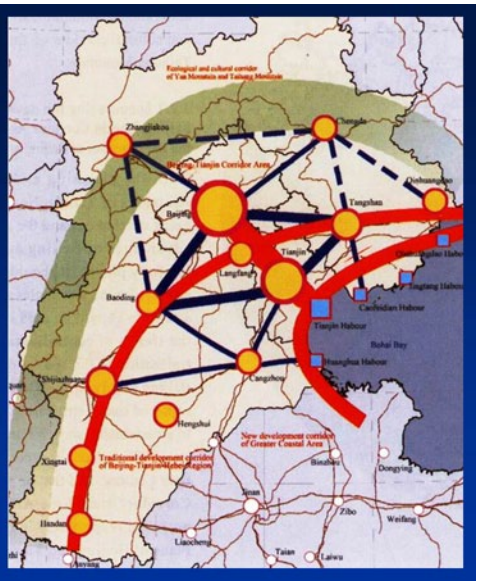

Priority axes and projects
Road
Railway
Inland waterway
Motorway of the sea
Airport project
Port project
Trans-European transport network
Priority project numbers
Road project
Railway project
Multimodal project
Inland waterway project
Motorway of the sea
Airport
Galileo
Trans-European transport network (TEN-T)
Priority axes and projects


China National Spatial Development Plan
N
0 260 520 km
National border
Provincial limit
Urban economic regions
Population and industry agglomerations
(Proposal by China Academy of Urban Planning and Design
Source: Wang 2006)


Metropolitan area
Key city cluster
Other city cluster
National key city (International City)
Regional key city
Important inland border city
Coastal urban belt
Urban development axis
Important corridor
Fig.4 National spatial structure of urban development
Source: From Outlines of National City System Planning (2005 – 2020)

Spatial Development Framework for Beijing-Tianjin-Hebei Megaregion

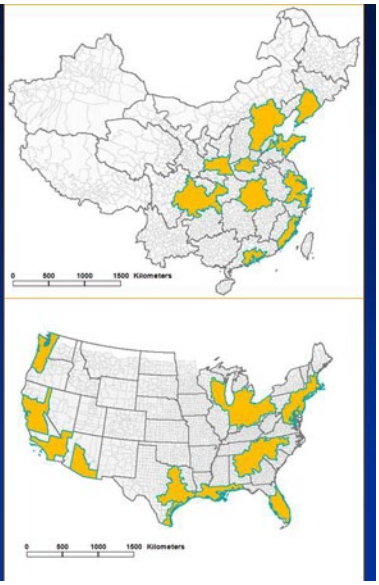
- One Axis (HSR)
- Three Belts



10 megas in China (NDRC version)

10 megas in the U.S. (RPA and Lang combined)

8 megas in Europe (Hall and Pain)



Population in Megas (2000)

Europe		USA		China	
Mega Name	Pop. (million)	Mega Name	Pop. (million)	Mega Name	Pop. (million)
Bassin Parisien	10.7	Northeast	49.5	Sichuan-Chongq.	92.5
Central Belgium	5.9	Great Lakes	41.5	B-T-H.	90.7
Greater Dublin	1.5	S. California	21.0	Yangtze Delta	76.8
N. Switzerland	7.3	Piedmont	18.4	Central Yangtze	60.5
The Randstad	16	Texas Tri.	14.7	Zhongyuan	41.7
Rhine Main	4.2	N. California	13.2	Shandong	39.2
Rhine Ruhr	11.7	Florida	12.9	Pearl River Delta	33.3
S.E. England	19	Cascadia	6.8	Central Liaoning	30.6
		Gulf Coast	6.5	Taiwan Strait	25.6
		Arizona	4.4	GanZhong	24.6
Total (mega)	76.3		188.8		515.5
Total (Country)	729		281.4		1,261.2

Persistent questions related to megaregion efforts:

- Space of places → Space of flows?
- Monocentricity → Polycentricity?
- Government → Governance?
- Planning products → Planning process?

Measure of Polycentricity with Rank-Size Coefficients

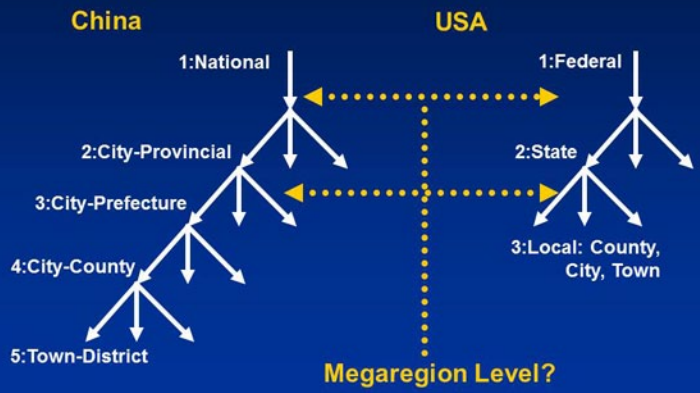
USA		China		Europe	
Mega Name	Coef.	Mega Name	Coef.	Mega Name	Coef.*
Northeast	-1.19	Sichuan-Chongqing	-1.05	Bassin Parisien	0.02
Great Lakes	-1.19	Beijing-Tianjin-Hebei	-1.33	Central Belgium	0.04
S. California	-1.41	Yangtze Delta	-1.12	Greater Dublin	0.06
Piedmont	-1.15	Central Yangtze	-1.00	N. Switzerland	0.05
Texas Tri.	-1.59	Zhongyuan	-0.89	The Randstad	0.16
N. California	-1.06	Shandong	-0.83	Rhine Main	0.08
Florida	-1.02	Pearl River Delta	-1.41	Rhine Ruhr	0.20
Cascadia	-1.63	Central Liaoning	-1.00	S.E. England	0.15
Gulf Coast	-1.19	Taiwan Strait Coast	-1.00		
Arizona	n/a	GanZhong	-1.15		
				* Use different metrics	

Challenges to Megaregion Governance

China: more functionally segregated among public agencies

USA: more geographically fragmented among local governments

Megaregion Governance

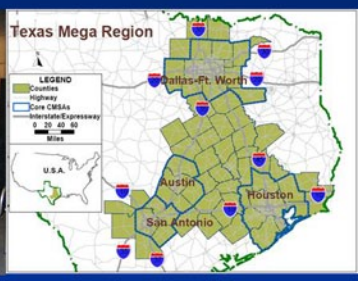


Megaregion Infrastructure: High-Speed Rail

High-Speed Rail network in the US, Europe, and China
(Source: MIT Technology Review, Nov/Dec, 2009, p.66)

"There's no reason Europe or China should have the fastest trains"
-President Obama, January 27, 2010

"Think Globally, Act Locally"



Mega Area (sqkm; 1000s)

Mega Name	Area (sqkm. 1000s)	% National Total	Mega Name	Area (sqkm. 1000s)	% National Total
Sichuan-Chongqing	223	2.39%	Northeast	161	1.76%
Beijing-Tianjin-Hebei	216	2.32%	Great Lakes	332	3.62%
Yangtze Delta	100	1.08%	S. California	128	1.39%
Central Yangtze	147	1.57%	Piedmont	235	2.56%
Zhongyuan	70	0.75%	Texas Tri.	148	1.62%
Shandong	73	0.78%	N. California	168	1.83%
Pearl River Delta	56	0.60%	Florida	80	0.87%
Central Liaoning	97	1.04%	Cascadia	106	1.16%
Taiwan Strait Coast	55	0.59%	Gulf Coast	115	1.26%
GanZhong	75	0.80%	Arizona	102	1.11%
Total	1111	11.91%	Total	1575	17.19%

Population Density in Megas (persons/sqkm)

China		USA	
Mega Name	Density	Mega Name	Density
Sichuan-Chongqing	415	Northeast	307
Beijing-Tianjin-Hebei	420	Great Lakes	125
Yangtze Delta	764	S. California	164
Central Yangtze	413	Piedmont	78
Zhongyuan	599	Texas Tri.	99
Shandong	537	N. California	79
Pearl River Delta	598	Florida	161
Central Liaoning	316	Cascadia	64
Taiwan Strait Coast	463	Gulf Coast	56
GanZhong	330	Arizona	43
Mega Average	464	Mega Average	120

APPENDIX 3

Freight Aspects of a Megaregion (Rob Harrison; UT CTR)

Mega-Regions and Efficient Freight Movement

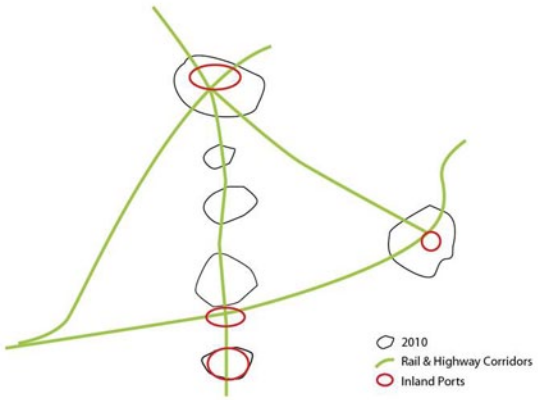
Robert Harrison
Center for Transportation Research
The University of Texas at Austin

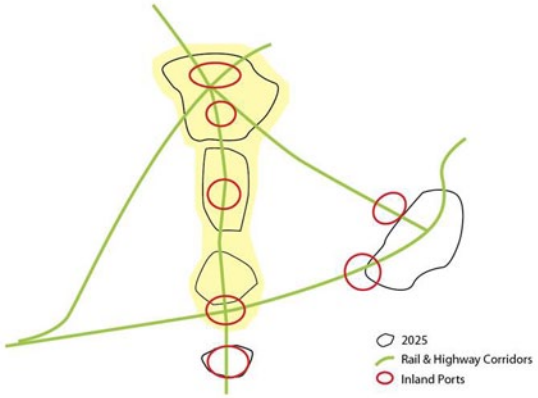
November 1, 2010

Freight has been rather neglected in metropolitan planning

Why does freight move as well as it does?

Logistics





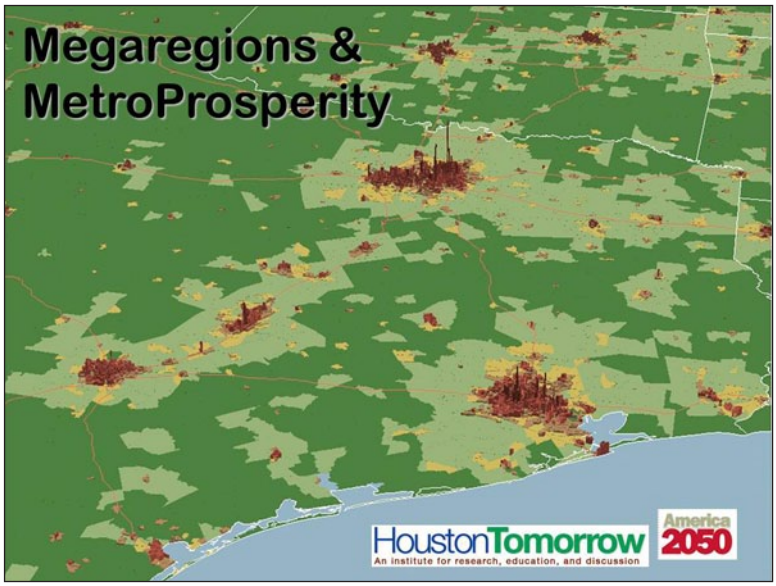
Models

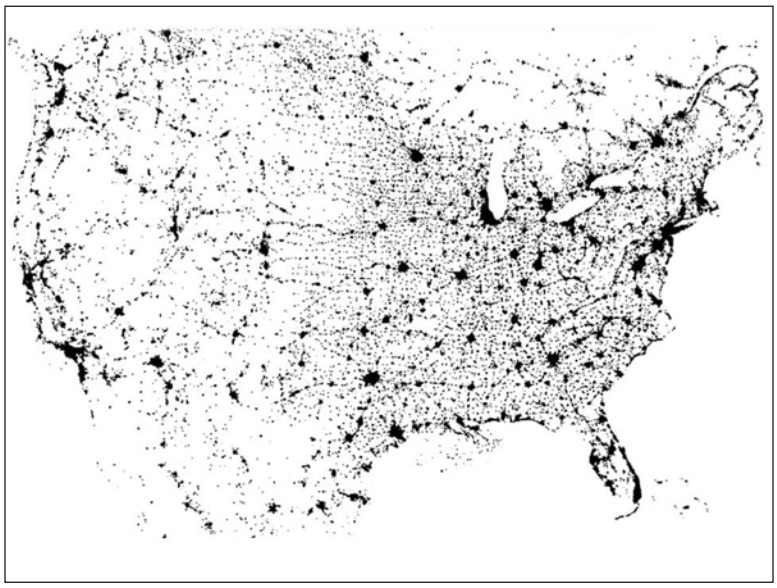
- Rail network (UTCP)
- Truck (TxDOT RTI)
- Inland Ports (TxDOT RTI)
- Rail model (UTCP)
- Supply chains (UTCP)
- Hybrid Trucks (UTCP)

Mega-Region planning needs to participate or lead in the location of load centers and inland ports

APPENDIX 4

US Megaregions Activities (David Crossley; Houston Tomorrow)





HoustonTomorrow
An institute for research, education, and discussion

America 2050

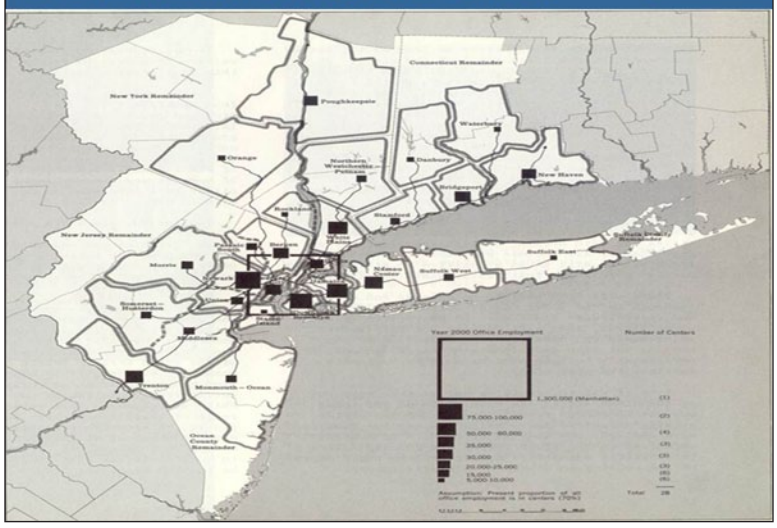
A National Strategy for Prosperity, Equity and Sustainability

Draft prospectus for review
April 21, 2006

4 4

A Constellation of Regional Centers

Regional Plan Association NJ NY



Research & Advocacy

Regional Plan Association NJ NY CT

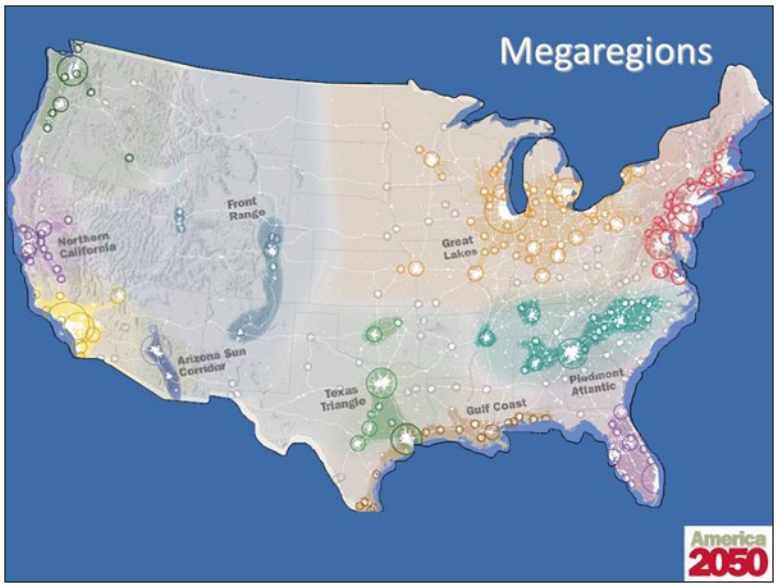
Four core programs designed to:

Strengthen urban centers community design, fiscal policy, housing.

Protect natural landscapes and water supplies
NY/NJ/CT Highlands, Long Island Sound, the New York Harbor and Governors Island.

Expand the transportation system transportation finance, traffic management, goods movement.

Prepare the region and the nation for the next generation of population and economic growth.



HoustonTomorrow

Central goal:

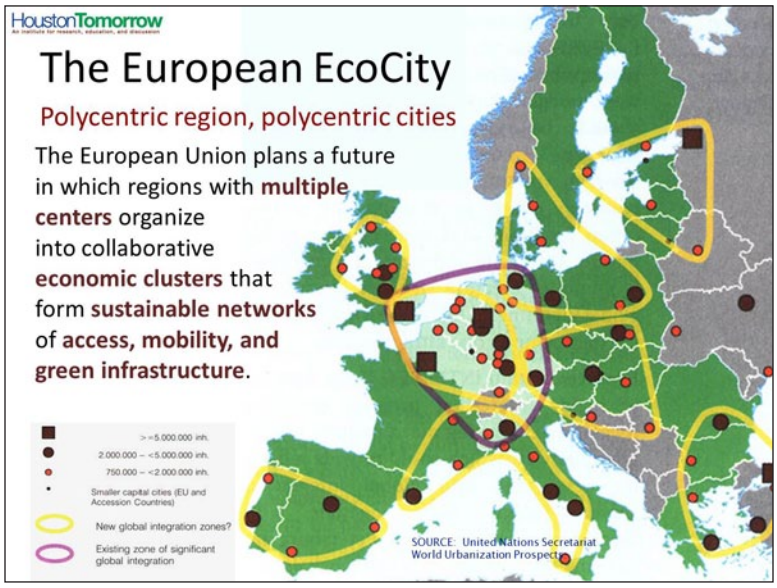
Reduce distances humans have to travel to gain access to goods, services, and each other.

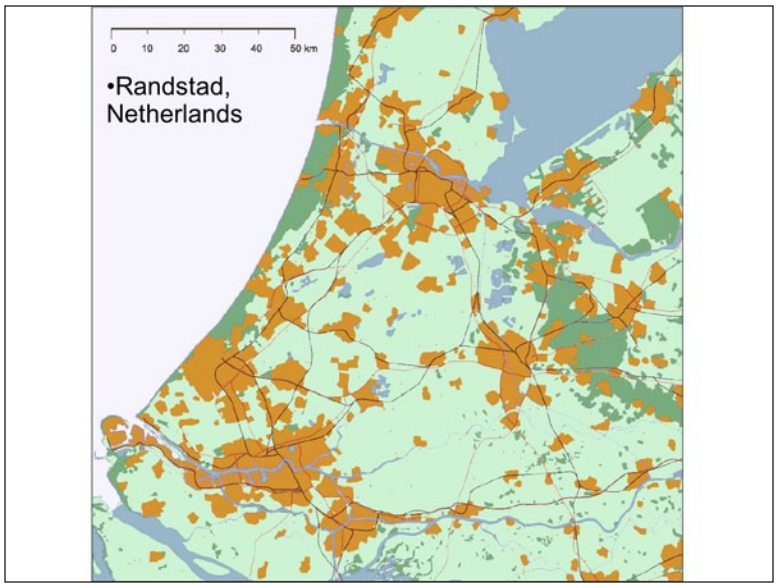
HoustonTomorrow

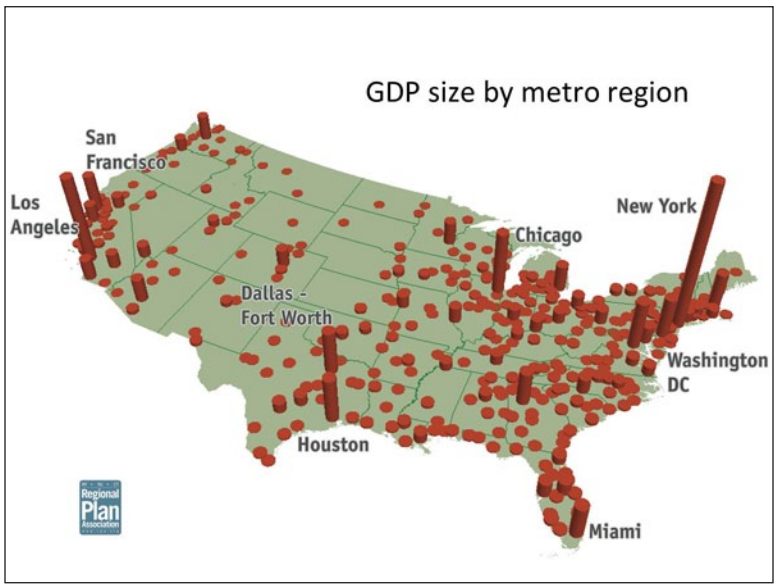
AIR
jobs
FORESTS
ESTUARIES
equity
FLOODING
WILDERNESS
WATER
affordability
Central issue:
education
HEALTH
BAYOUS
Land use
BAYS
mobility
BIRDS
HABITAT
TREES
RIVERS
heat
RECREATION
FOOD
stress
historic preservation
neighborhoods

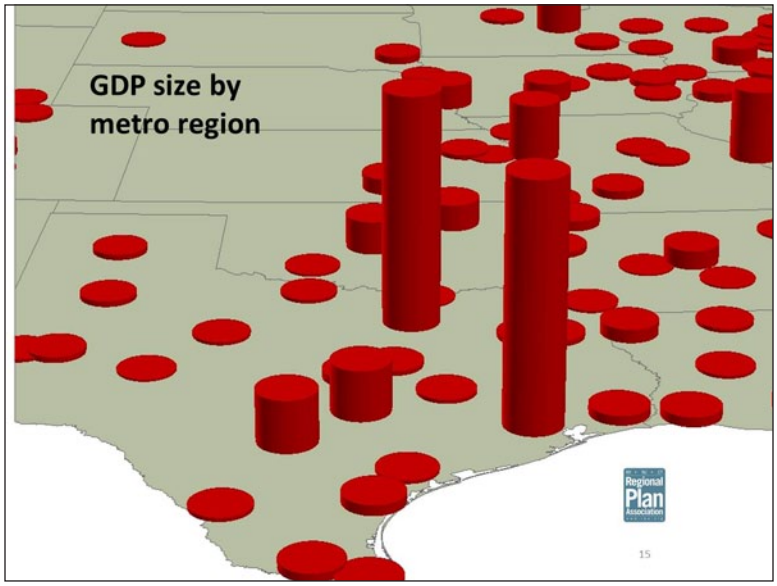
HoustonTomorrow

Nothing impacts land use like transportation infrastructure.

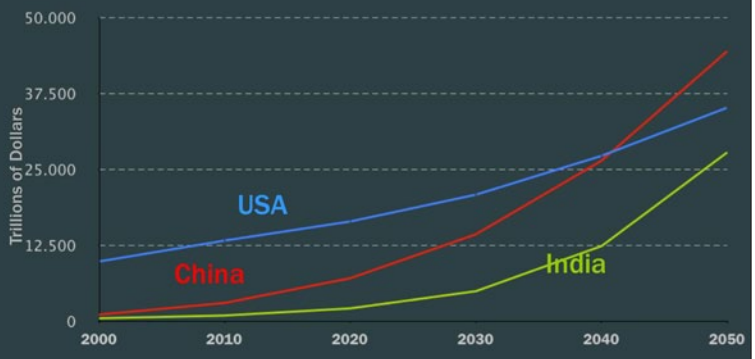

HoustonTomorrow
The European EcoCity
Polycentric region, polycentric cities
The European Union plans a future in which regions with multiple centers organize into collaborative economic clusters that form sustainable networks of access, mobility, and green infrastructure.
>=5.000.000 inh.
2.000.000 – <5.000.000 inh.
750.000 – <2.000.000 inh.
Smaller capital cities (EU and Accession Countries)
New global integration zones?
Existing zone of significant global integration
SOURCE: United Nations Secretariat World Urbanization Prospects


0 10 20 30 40 50 km
•Randstad, Netherlands


GDP size by metro region
San Francisco
Los Angeles
Chicago
New York
Dallas - Fort Worth
Washington DC
Houston
Miami
Regional Plan Association



Projected GDP Growth



Source: Global Economics Paper No: 99 "Dreaming With BRICs: The Path to 2050" Goldman Sachs (October 2003)

16

Placed Based Opportunities

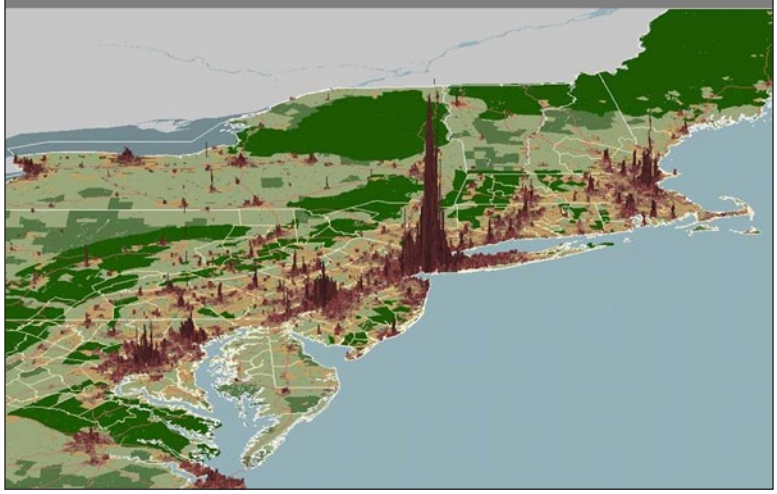
- High-Speed Rail
- Water Infrastructure
- Landscapes
- Revitalizing Underperforming Places

17

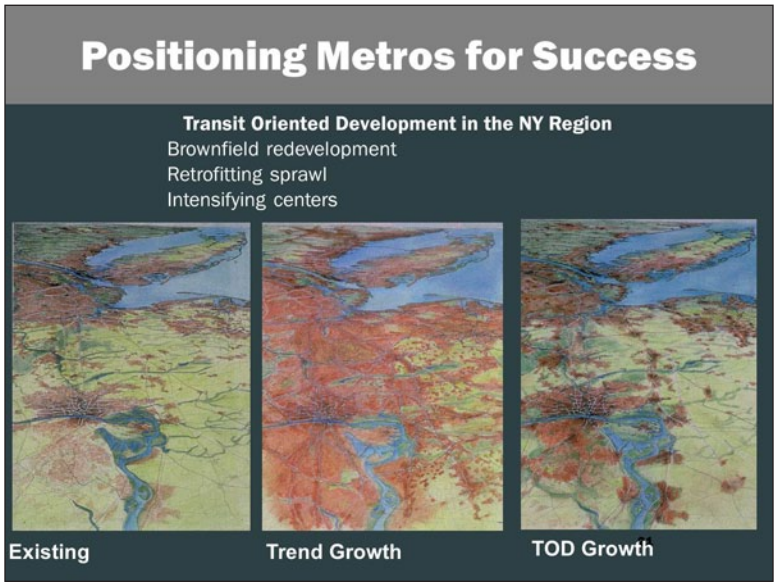
A Systems Approach to Water Resources

Can we reframe the decision-making process to establish a results oriented, outcome driven watershed approach that meets national goals and standards?

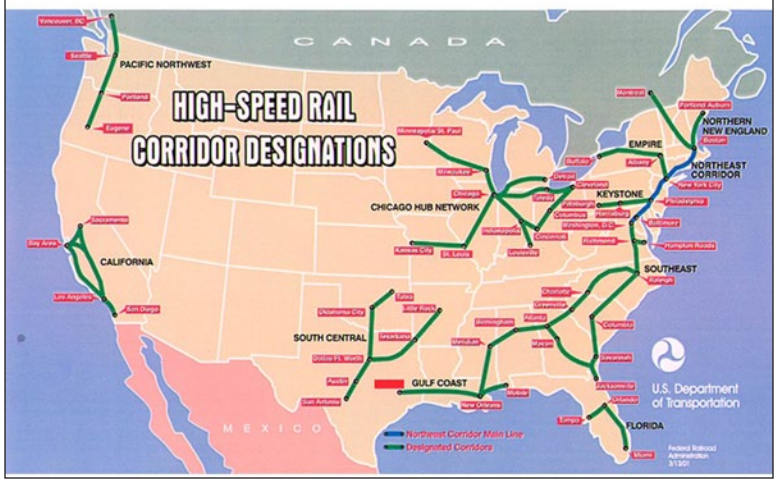
Positioning Megaregions for Success



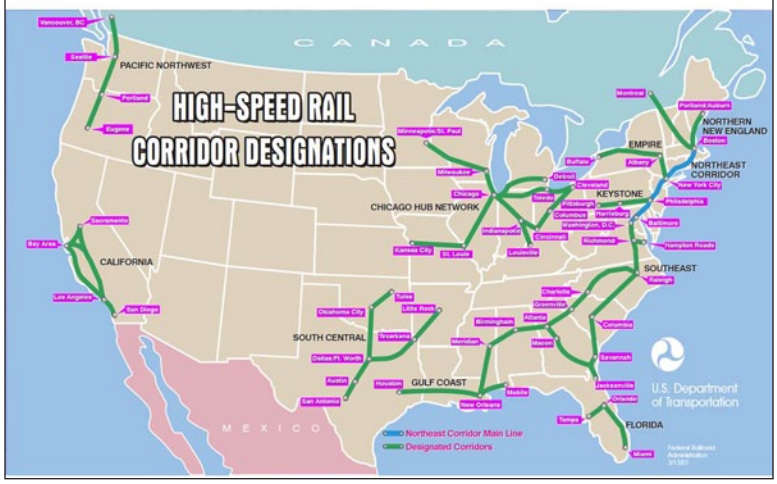
Positioning Megaregions for Success



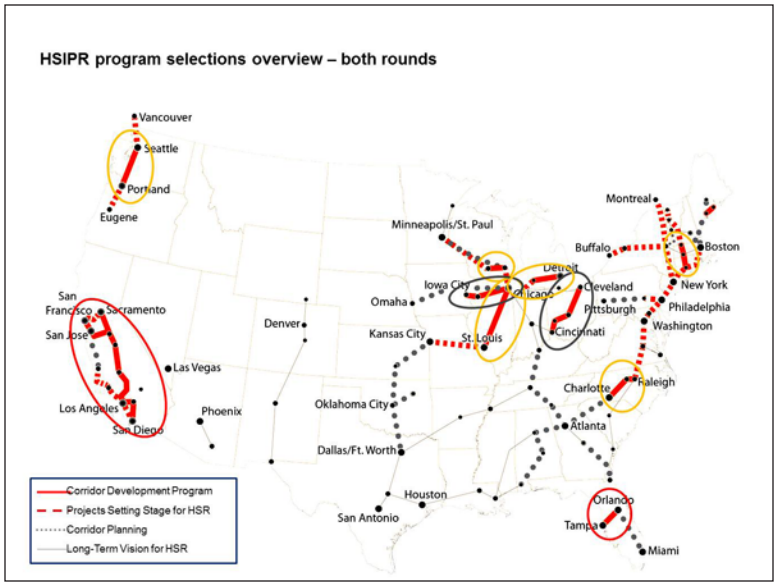
National high speed rail map, 1999

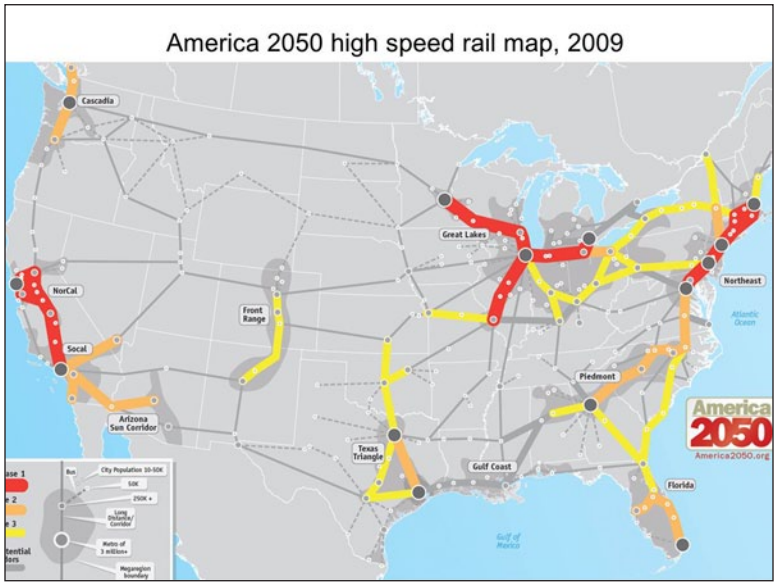


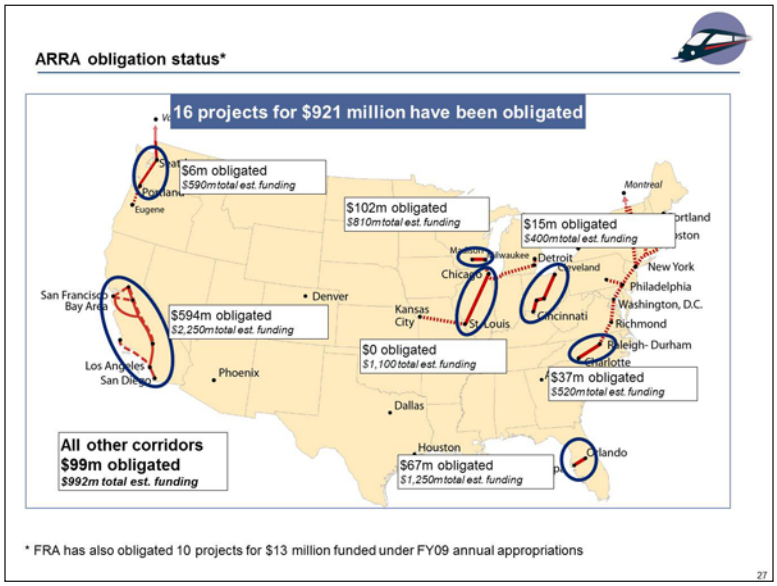
National high speed rail map, 2004

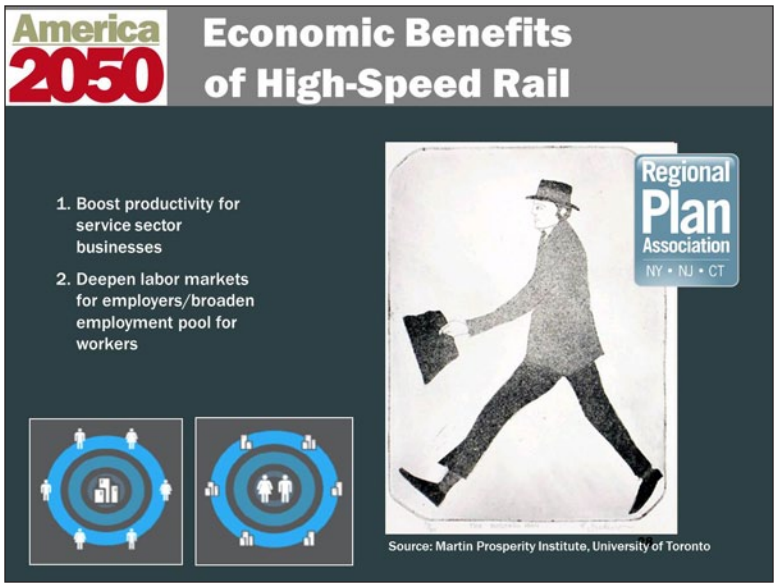


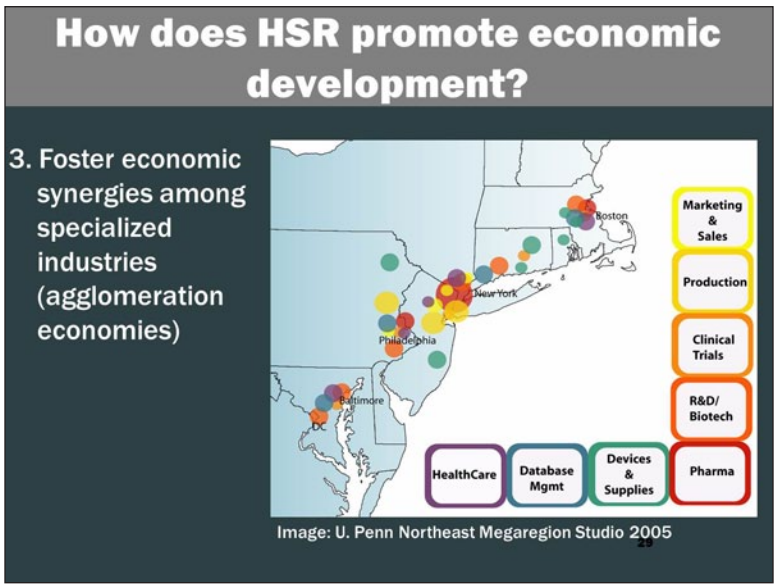

VISION for HIGH-SPEED RAIL in AMERICA
Northern New England
Pacific Northwest
Empire
Chicago Hub Network
Keystone
NEC
California
Southeast
South Central
Gulf Coast
Florida
KEY
Designated High-speed Rail Corridor
Northeast Corridor (NEC)
Other Passenger Rail Routes


HSIPR program selections overview – both rounds
Vancouver
Seattle
Portland
Eugene
San Francisco
Sacramento
San Jose
Las Vegas
Los Angeles
San Diego
Phoenix
Denver
Minneapolis/St. Paul
Omaha
Iowa City
Chicago
Detroit
Cleveland
Buffalo
Montreal
Boston
New York
Philadelphia
Washington
Pittsburgh
Cincinnati
Kansas City
St. Louis
Oklahoma City
Dallas/Ft. Worth
Houston
San Antonio
Charlotte
Raleigh
Atlanta
Orlando
Tampa
Miami
Corridor Development Program
Projects Setting Stage for HSR
Corridor Planning
Long-Term Vision for HSR


America 2050 high speed rail map, 2009
Cascadia
Great Lakes
NorCal
Front Range
Northeast
Socal
Piedmont
Arizona Sun Corridor
Texas Triangle
Gulf Coast
Florida
America 2050
America2050.org


ARRA obligation status*
16 projects for $921 million have been obligated
$6m obligated
$590m total est. funding
$102m obligated
$810m total est. funding
$15m obligated
$400m total est. funding
$594m obligated
$2,250m total est. funding
$0 obligated
$1,100 total est. funding
$37m obligated
$520m total est. funding
All other corridors
$99m obligated
$992m total est. funding
$67m obligated
$1,250m total est. funding
Montreal
Eugene
Denver
Chicago
Detroit
New York
Philadelphia
Washington, D.C.
Richmond
Raleigh- Durham
Charlotte
Kansas City
St. Louis
Cincinnati
San Francisco Bay Area
Los Angeles
San Diego
Phoenix
Dallas
Houston
Orlando
* FRA has also obligated 10 projects for $13 million funded under FY09 annual appropriations
27


America 2050
Economic Benefits of High-Speed Rail
1. Boost productivity for service sector businesses
2. Deepen labor markets for employers/broaden employment pool for workers
Regional Plan Association
NY • NJ • CT
Source: Martin Prosperity Institute, University of Toronto


How does HSR promote economic development?
3. Foster economic synergies among specialized industries (agglomeration economies)
Boston
New York
Philadelphia
Baltimore
DC
Marketing & Sales
Production
Clinical Trials
R&D/ Biotech
Pharma
Devices & Supplies
Database Mgmt
HealthCare
Image: U. Penn Northeast Megaregion Studio 2005

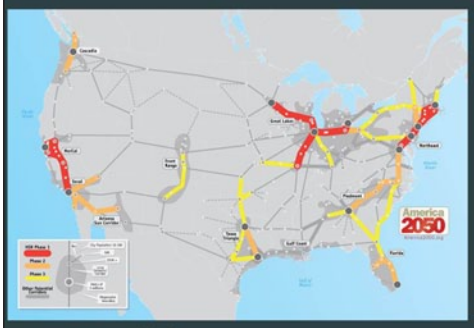
How does HSR promote economic development?

4. Serve as a foca point of future development
5. Make better, more efficient use of infrastructure

Eurostar Station and development, Lille, France

30

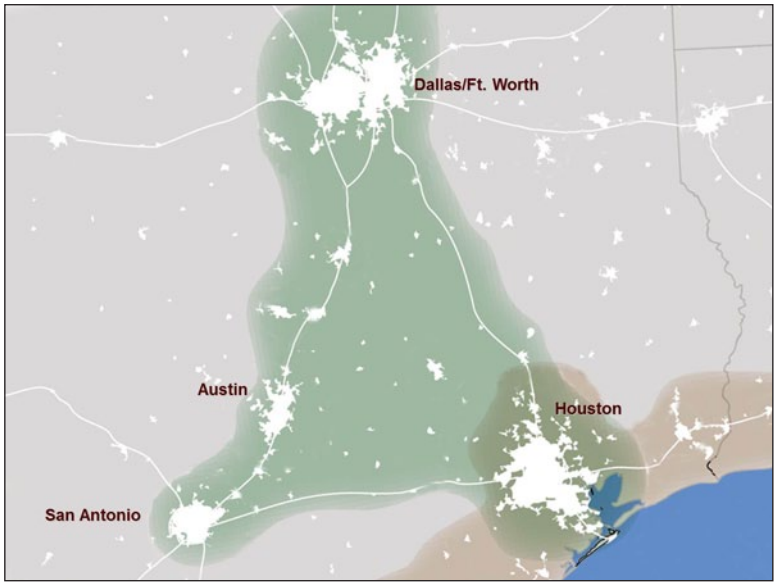
Where High-Speed Rail Works Best

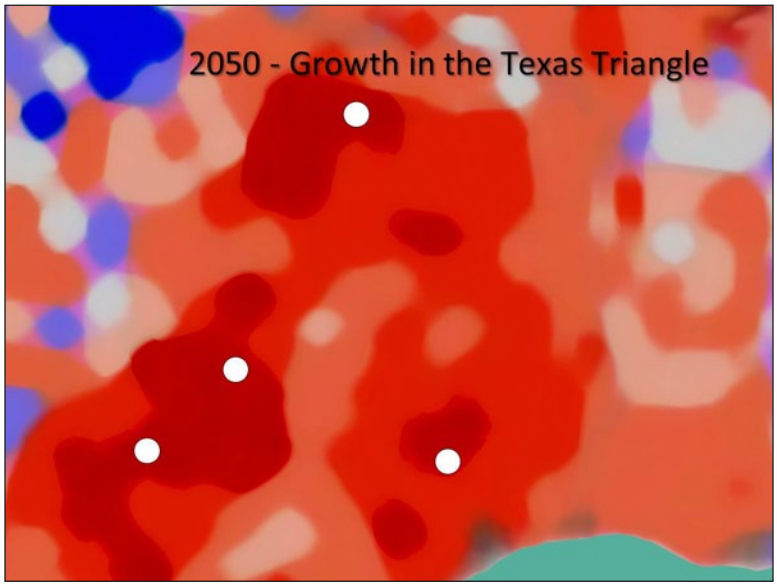


www.America2050.org

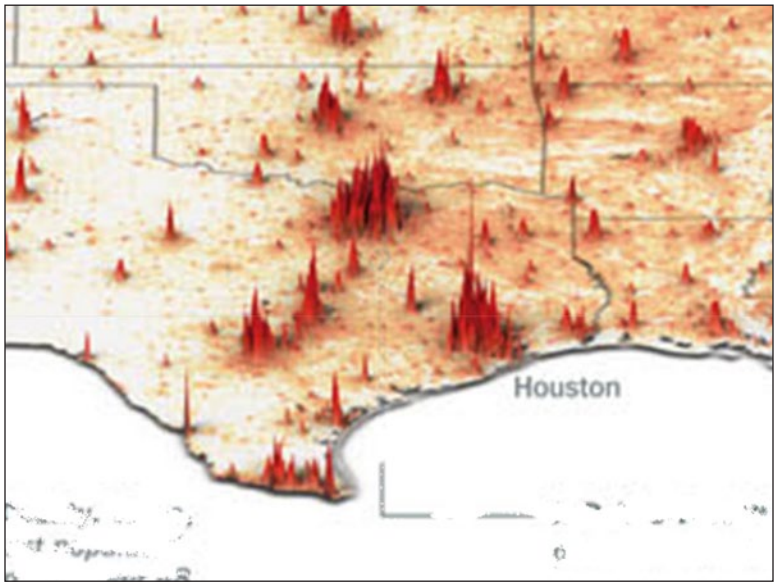
- Population
- Distance
- Transit connections
- Economic productivity
- Congestion
- In a megaregion

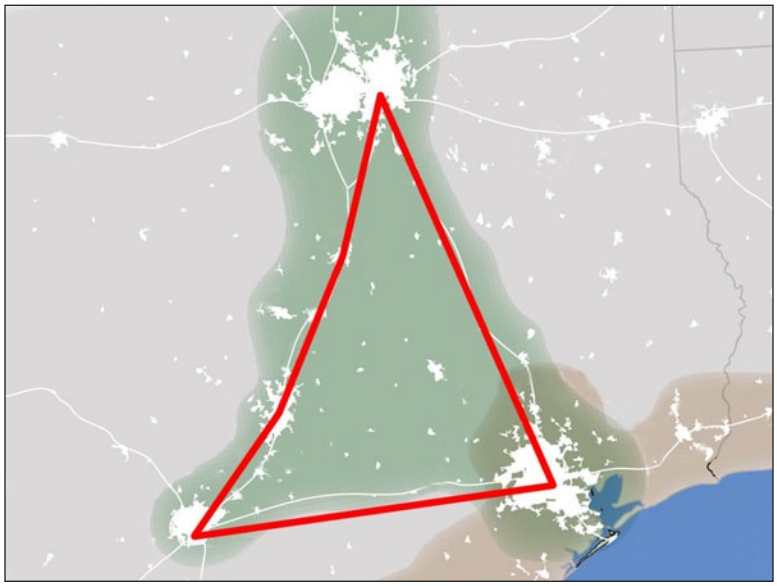
31

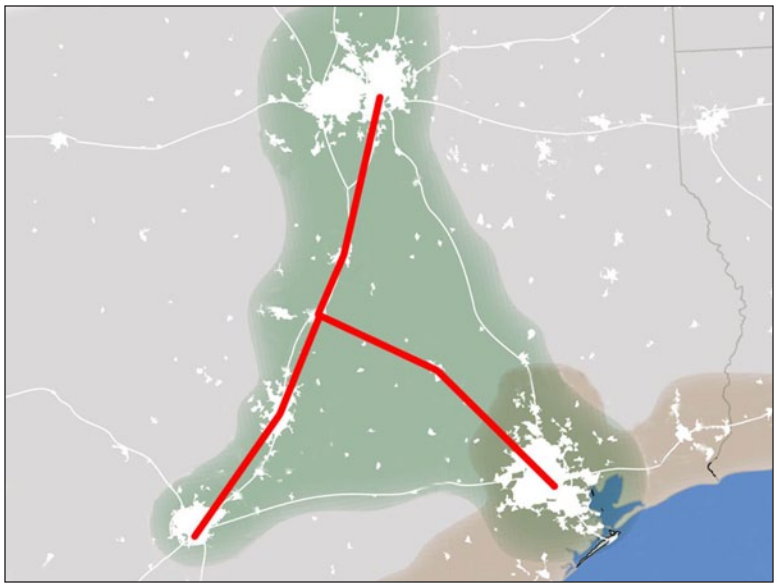


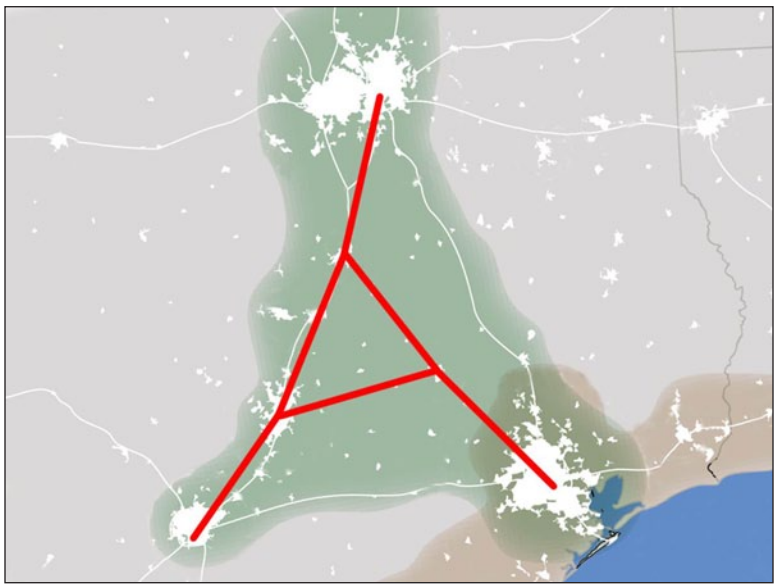

2050 - Growth in the Texas Triangle

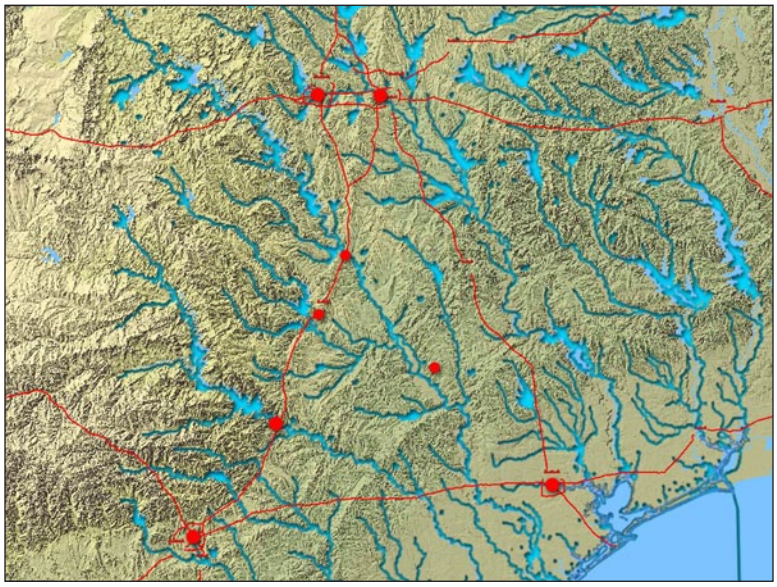

HoustonTomorrow
High-Speed
Rail for
the Houston
Region

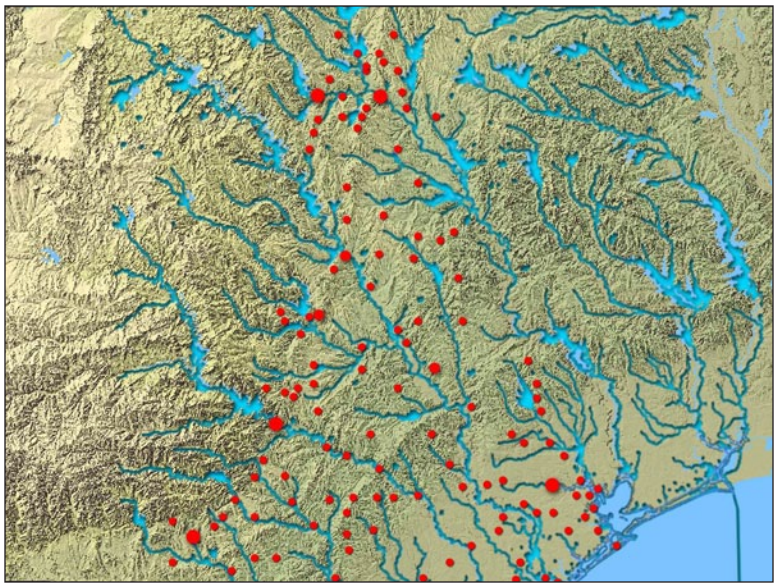

Houston











HoustonTomorrow

Sustainable Texas Triangle

Focus on centers of many sizes throughout the megaregion.

Improve the connections among them

Improve and enrich greenspace, including agricultural land.

Remove “sprawl” from the lexicon.

HoustonTomorrow

Sustainable Texas Triangle

Quality of life > Standard of living

Sustainable Texas Triangle

The Texas Triangle is a sustainable megaregion with multiple clusters of cities, towns, villages, and neighborhoods with improved access to people, goods, services, and other amenities in healthy green infrastructure.

APPENDIX 5
List of Attendees

ATTENDEE	AGENCY
Dock Burke	Southwest Region University Transportation Center
W. Gordon Derr	City of Austin, Transportation Department
Rob Harrison	University of Texas, Center for Transportation Research
David Crossley	Houston Tomorrow
Ming Zhang	University of Texas at Austin
George Zapalac	City of Austin, Planning and Development
Alan Clark	Houston Galveston Area Council
Scott Ericksen	San Antonio, Bexar County MPO
Duncan Stewart	Texas Department of Transportation, Research and Technology Implementation Office
Dan Lamers	North Central Texas Council of Governments
Donovan Johnson	University of Texas, Center for Transportation Research
Dan Seedah	University of Texas, Center for Transportation Research
Margaet Shaw	City of Austin- Economic Growth and Redevelopment Services Offices
Howard Lazarus	City of Austin, Public Works
Sheri Smith	Texas Southern University, Urban Planning and Environmental Policy
Lisa Loftus-Otway	University of Texas, Center for Transportation Research
Sara Land	Texas Southern University, Center for Transportation Training and Research
Betty	Texas Southern University, Center for Transportation Training and Research
Carol Abel Lewis	Texas Southern University, Center for Transportation Training and Research