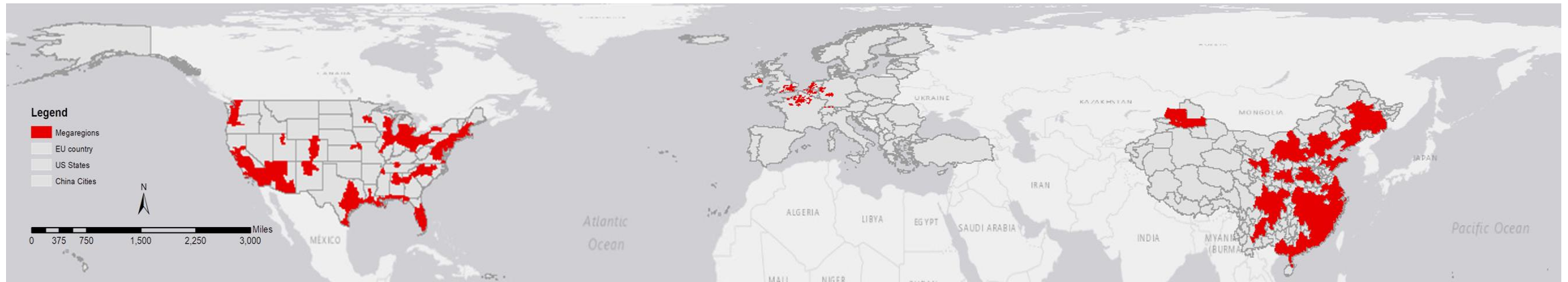


The Megaregional Process: What's happening in the Texas Triangle and the rest of the world?

- Introduction to UTC/CM²
- Megaregion concept and efforts in the US and abroad
- Megaregional process in the Texas Triangle
- Discussions



1. What is University Transportation Center (UTC)?

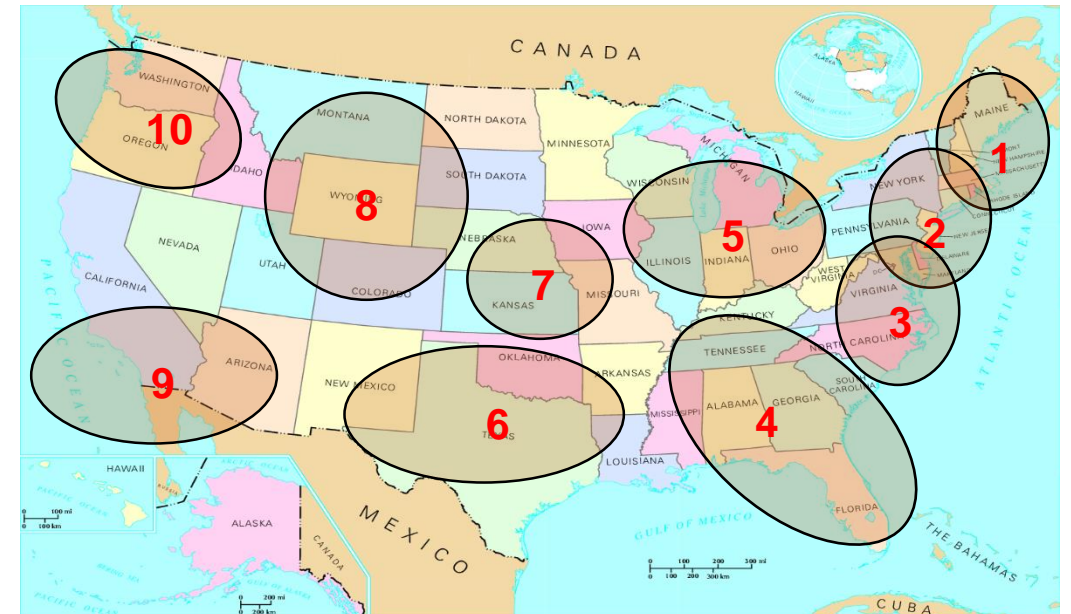
UTC program created by USDOT with authorization of federal Transportation Acts

UTC Mission and Objectives

- Research
- Education and Workforce Development
- Technology Transfer



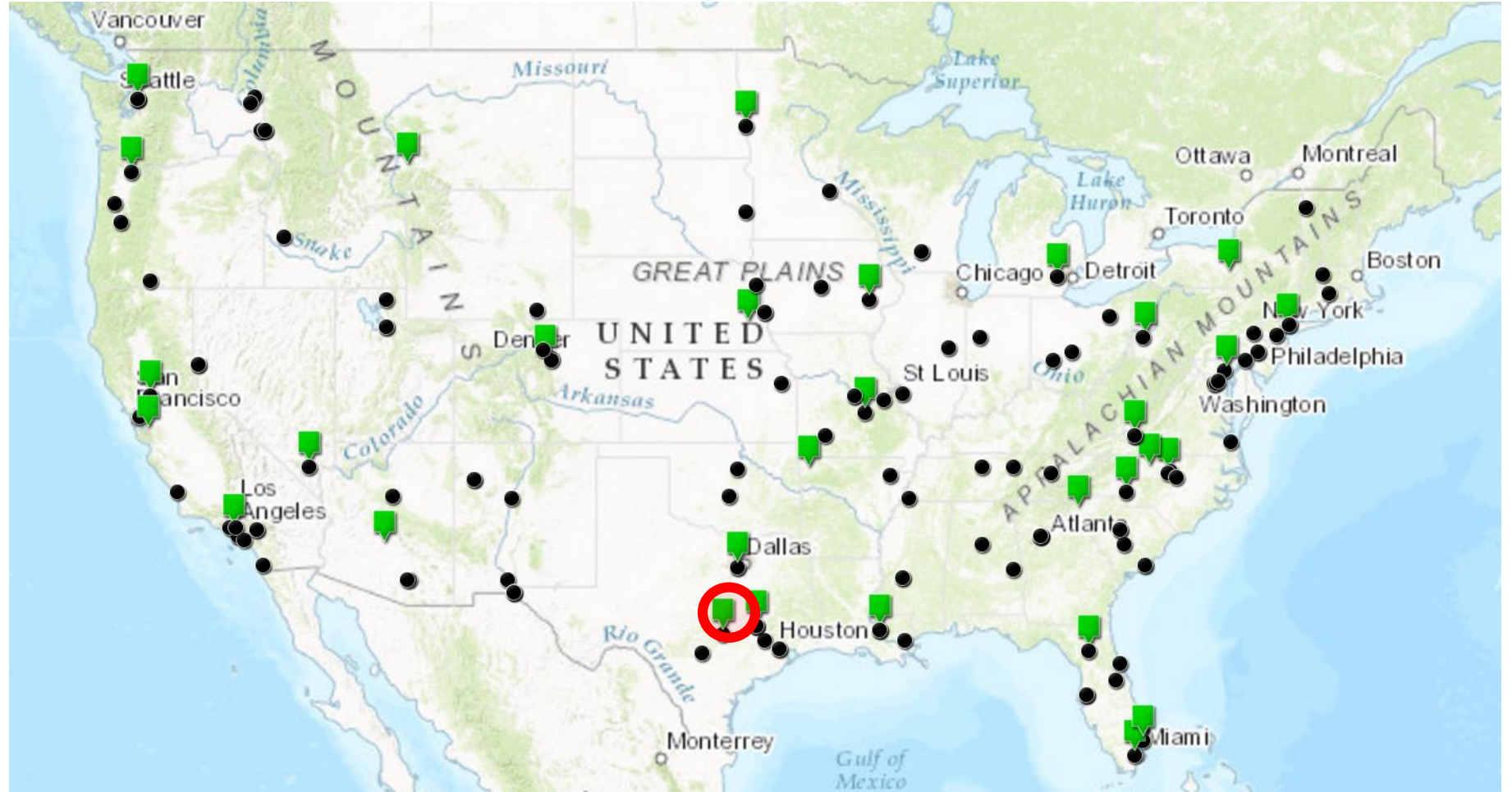
The screenshot shows the Transportation.gov website. The header includes the Transportation.gov logo and a search bar. The main content area is titled "University Transportation Centers" and features a large graphic of a torch with the letters "UTC" and the years "1987" and "2020". Below the graphic, there is a section titled "University Transportation Centers (UTC) Program 2017 Grant Solicitation For Regional Centers in Federal Regions 1, 2, 3". The text states: "Due to a lack of meritorious UTC grant applications from three DOT Regions during the recent 2016 competition, a new solicitation has been issued for Regions 1, 2 & 3."



UTC 2016 Competition (Announced Dec. 5, 2016)

FAST Act Total: \$300+ billion; For UTC: \$300 million

UTC Proposals: 212 applications, 32 awarded



About

Research

News & Events

Tech Transfer & Education

Support Partner Program

MISSION

The consortium of Cooperative Mobility for Competitive Megaregions (CM2) aims to advance research, education, and technology transfer initiatives to improve the mobility of people and goods in urban and rural communities of megaregions.

LEARN MORE

WMB 6.120, UT Main

<http://sites.utexas.edu/cm2/>

https://twitter.com/CM2_UTC

CM² Proposed Activities

FAST ACT Priorities and Topic Areas selected

Priority 1: Improving mobility of people and goods;

Priority 2: Reducing congestion;

Priority 3: Promoting safety;

Priority 4: Improving the durability and extending the life of transportation infrastructure;

Priority 5: Preserving the environment; and

Priority 6: Preserving the existing transportation system.

CM² Selected Topic Areas

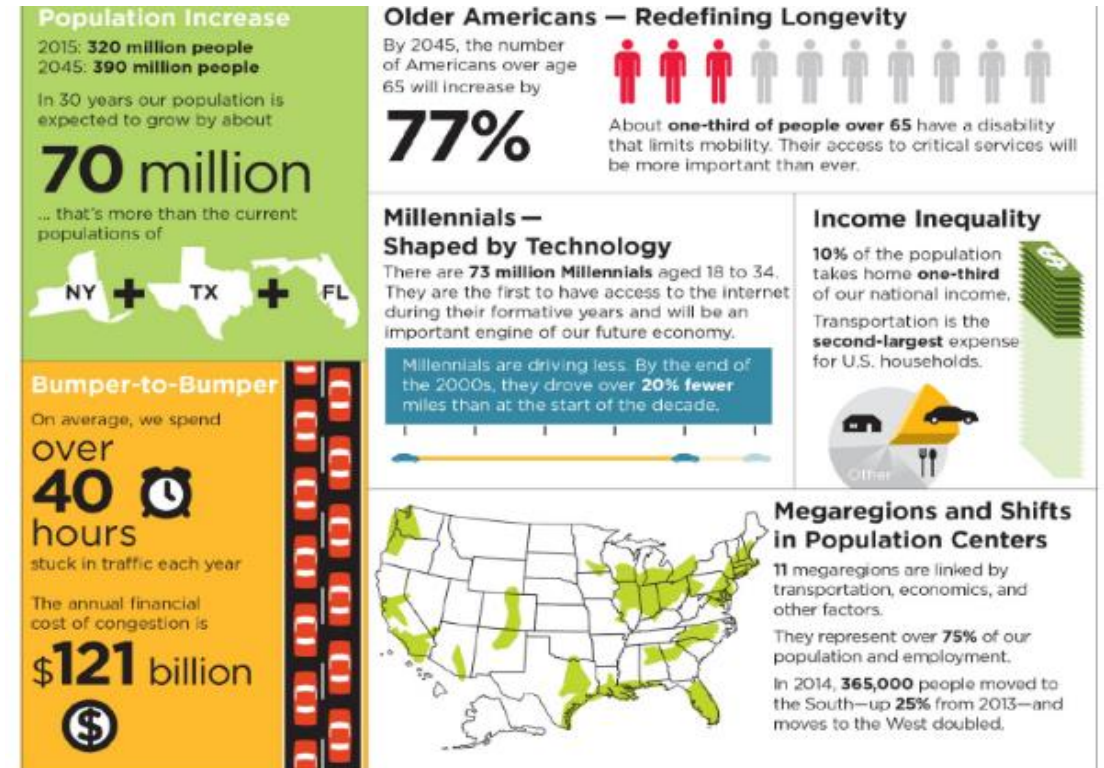
Topic Area 1: Regional planning and setting of transportation priorities

Topic Area 2: Increase access to opportunities that promote equity in connecting regions and communities, including urban and rural communities.

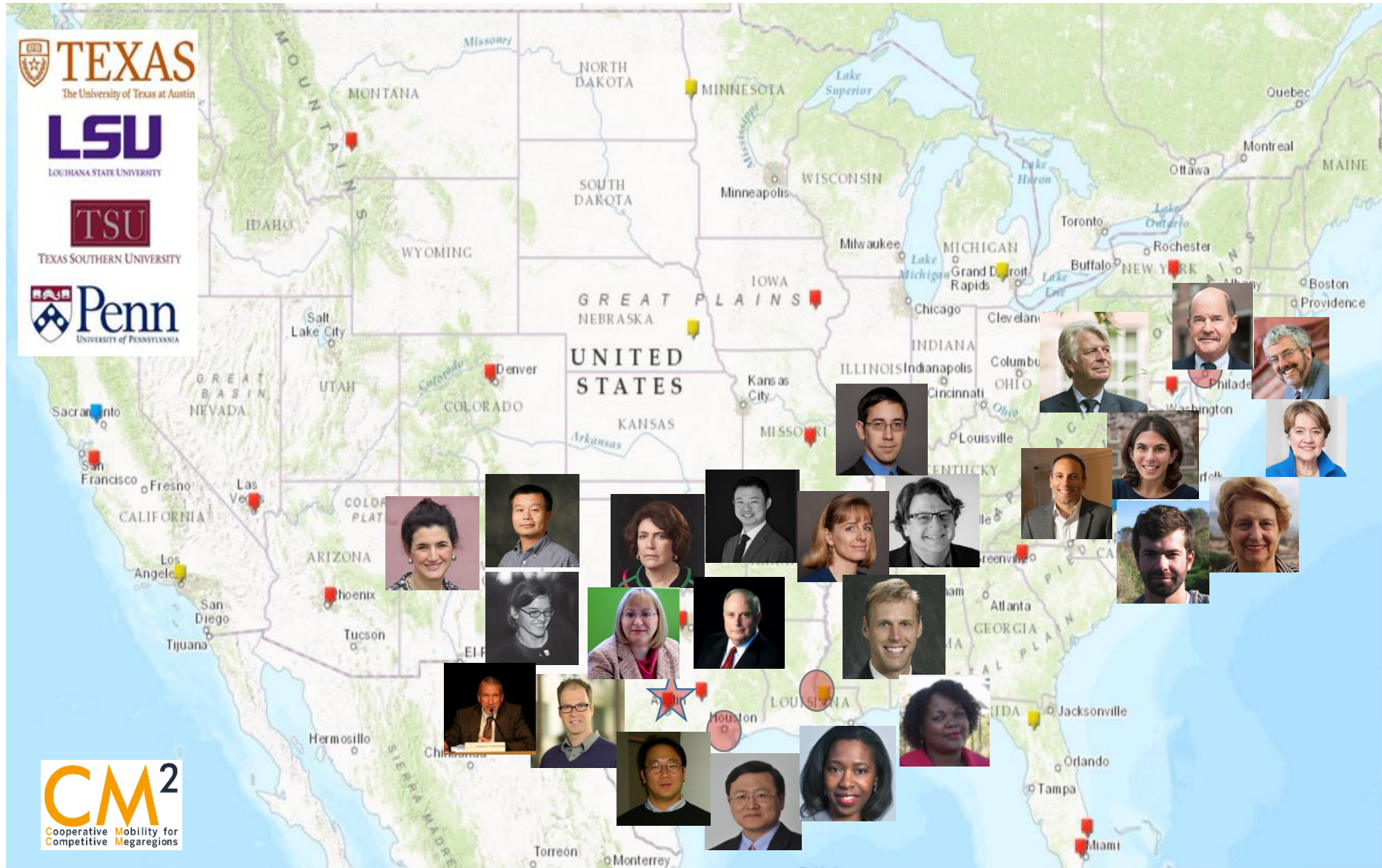
Topic Area 3: Innovations in multi-modal planning and modeling for high-growth regions



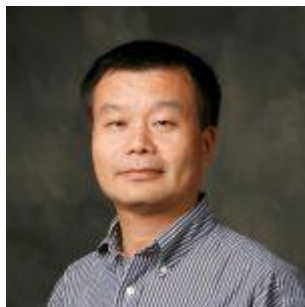
USDOT Strategic Plan, 2015



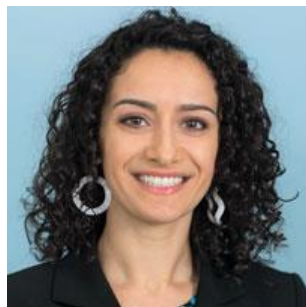
USDOT UTC (Tier-1): Cooperative Mobility for Competitive Megaregions (CM²)



CM² Admin Staff, GRAs, and Researchers



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CM² Director
Professor, The
University of Texas at
Austin



Inessa Ach
CM² Assistant
Director for
Administration



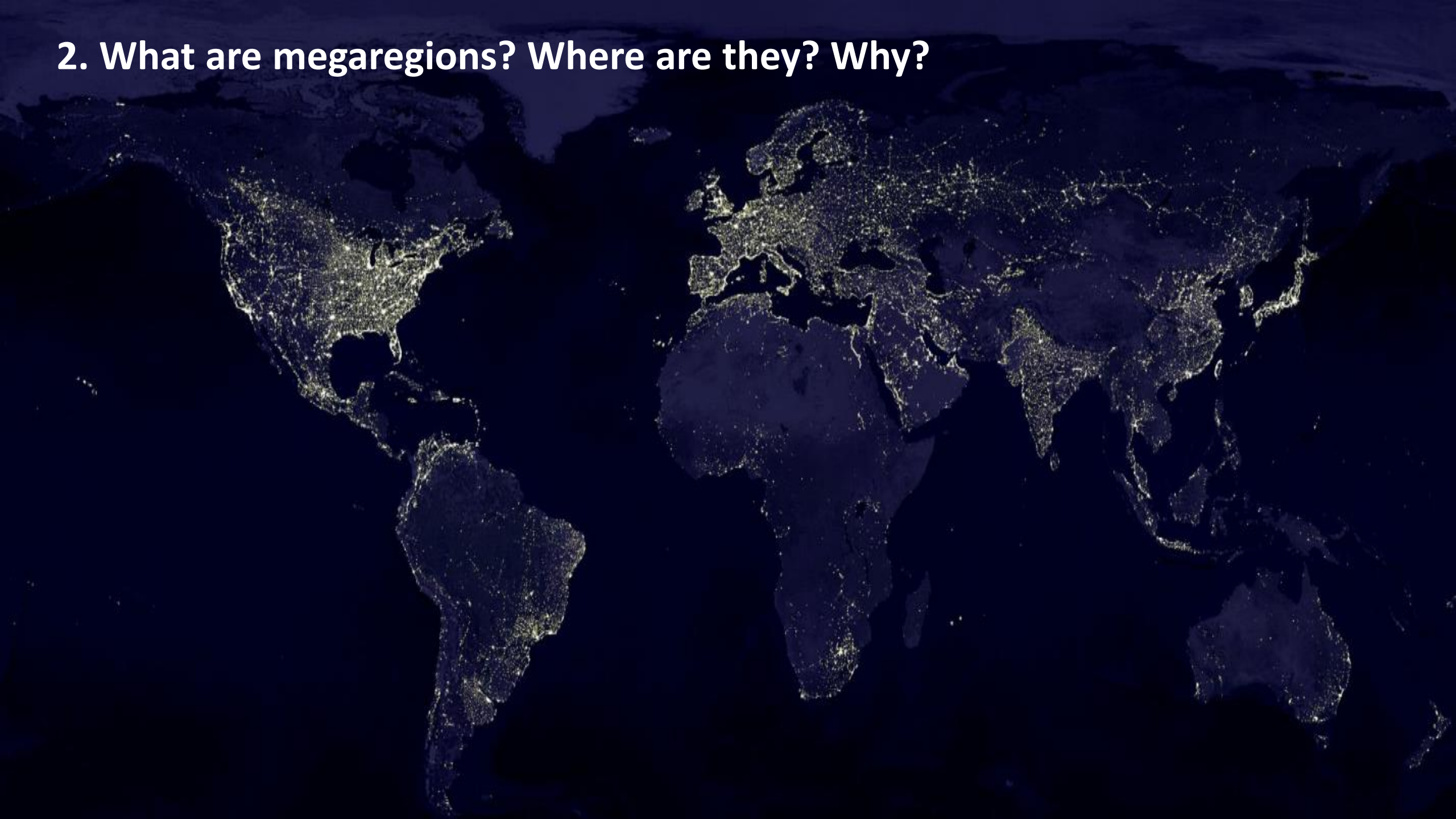
Lisa Loftus-Otway
CM² Assistant
Director for Research



Nicole McGrath
CM² Graduate Research
Assistant for
Administration



2. What are megaregions? Where are they? Why?



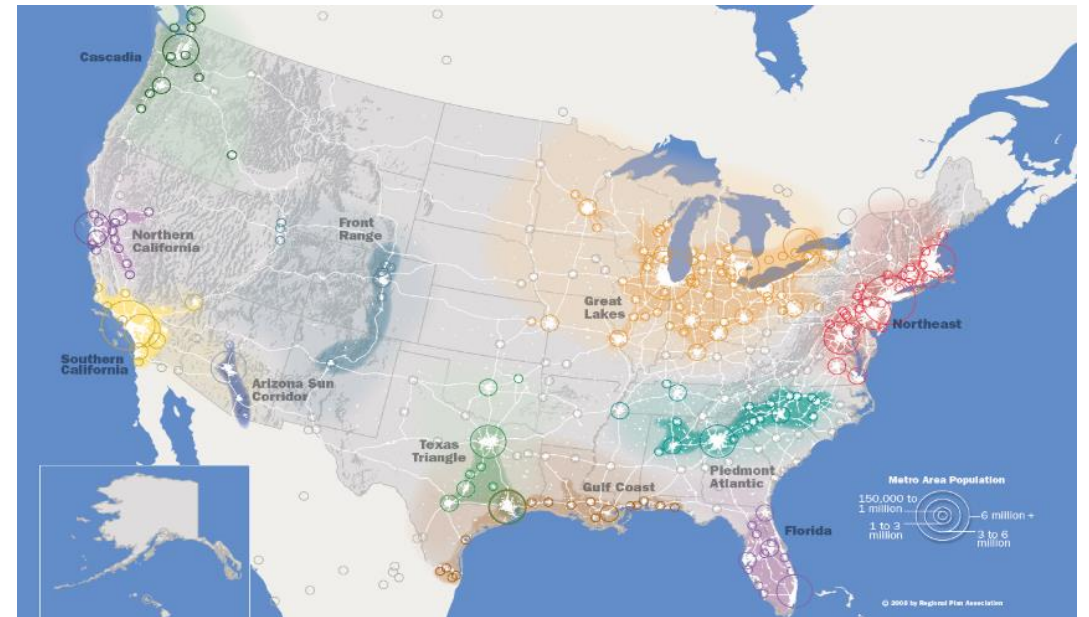
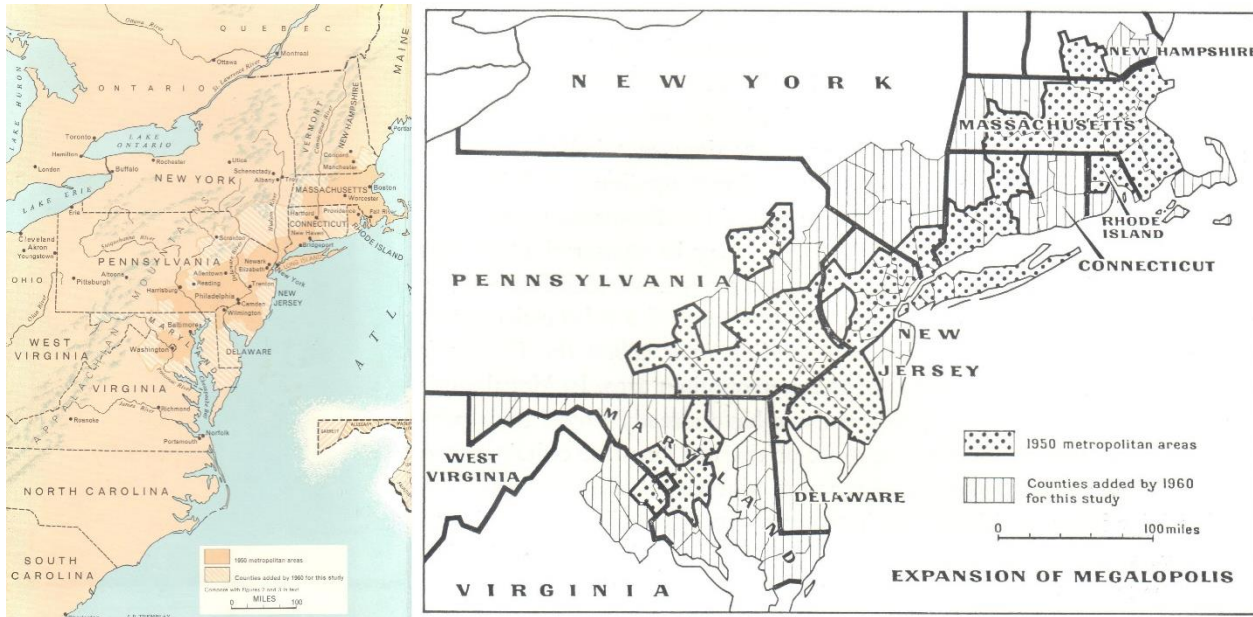
Re-Discovery of Jean Gottmann's Megalopolis in the 21st Century

Jean Gottmann (1961):

“The cradle of a new order in the organization of inhabited space.”

RPA/Penn 2004 Study:

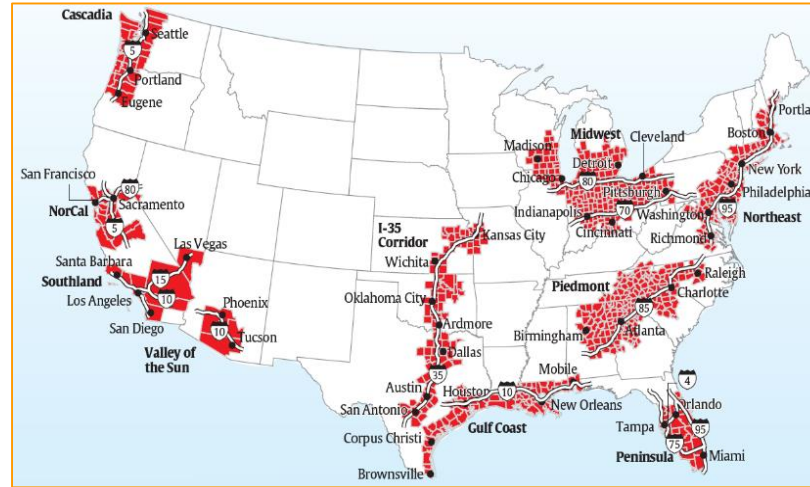
70~80% of US population, employment, and wealth concentrate in the 11 agglomerations of networked metropolitan areas and their integrated hinterland



Regional Plan Association 2005

Strong Interests in the United States ...

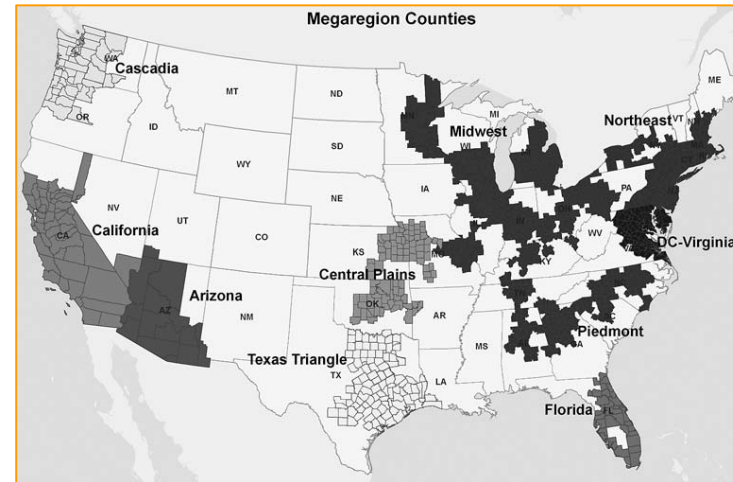
- Trend of continued urbanization/agglomeration
- New geographic unit for competition in economic globalization
- Concerns over current and future challenges associated with the agglomeration
- Strategic preparation, especially in infrastructure investments



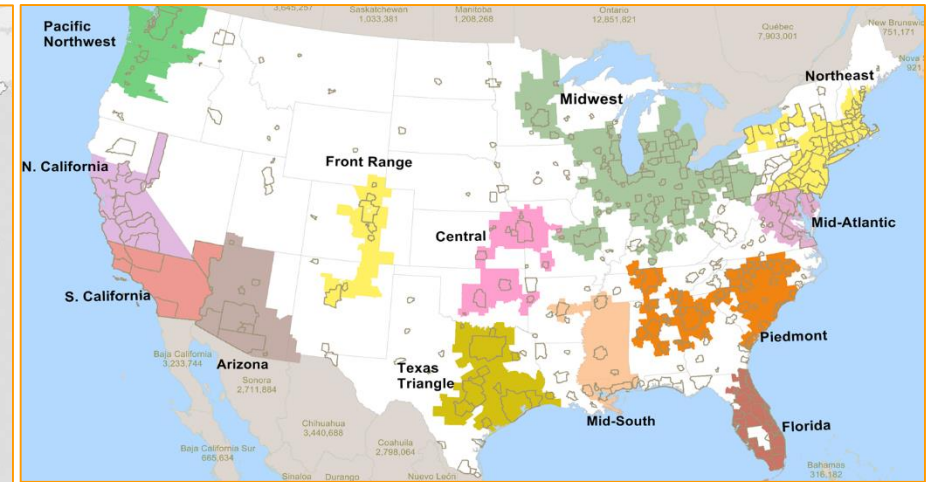
Robert E. Lang 2005



Richard Florida 2008



Catherine L. Ross 2009



USDOT 2015

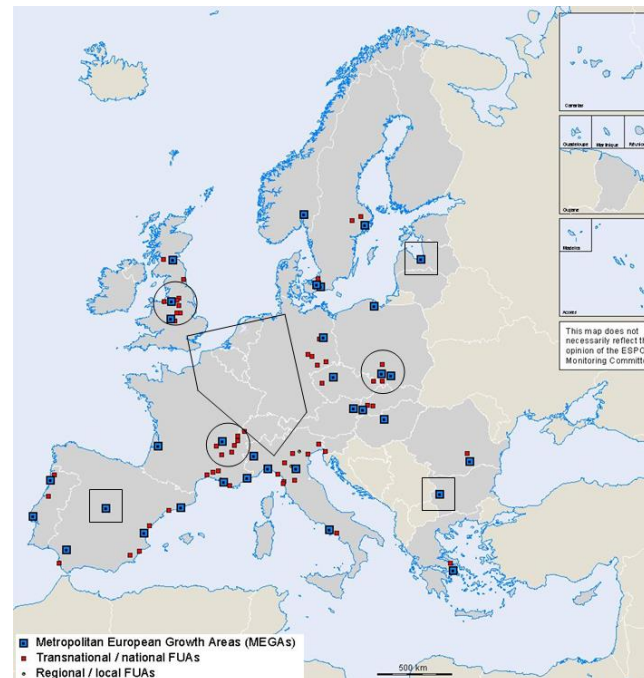
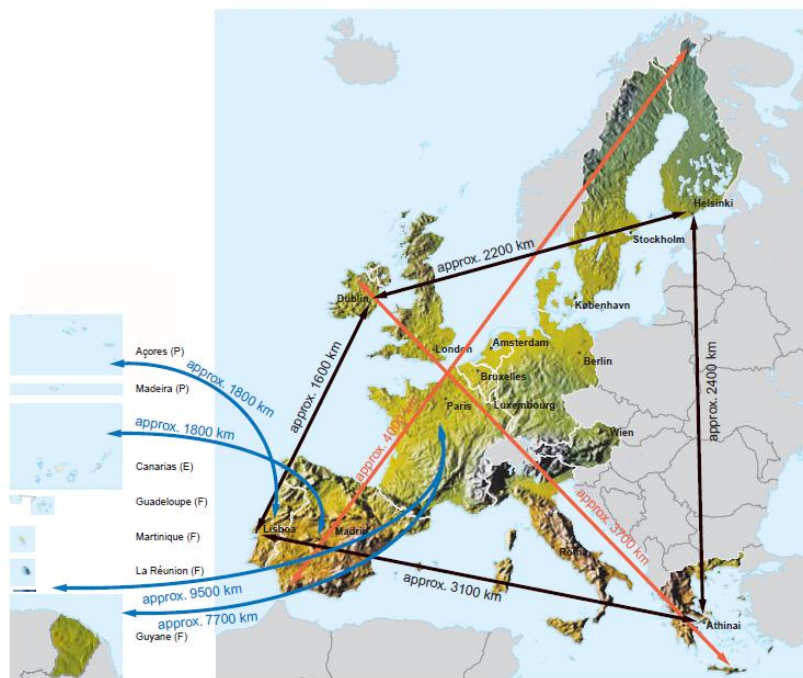
The European Practice

“European Spatial Development Perspective”

-- European Commission, 1999

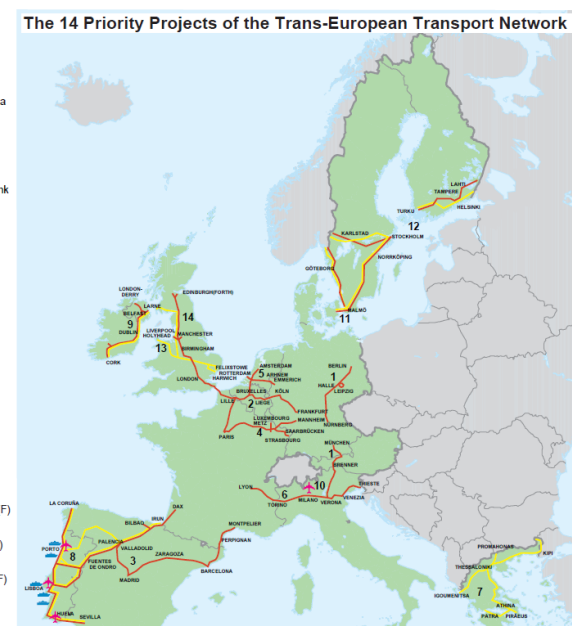
Key Concepts:

- 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. Beluvs-Ling: 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 railroad Link Denmark-Sweden
12. Nordic Triangle Multimodal Corridor
13. Ireland/United Kingdom/Benelux road link
14. West Coast Main Line

Source: European Commission GD VII

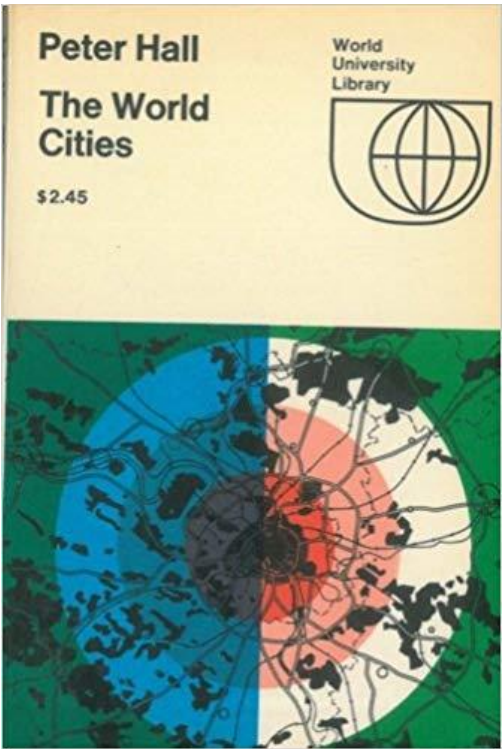


The UK Concept and Practice

Peter Hall, 1966

World City of polycentric regions

e.g., The Randstad and the Rhine-Ruhr region



Peter Hall and Kathy Pain 2005, 2006

Mega-City Region

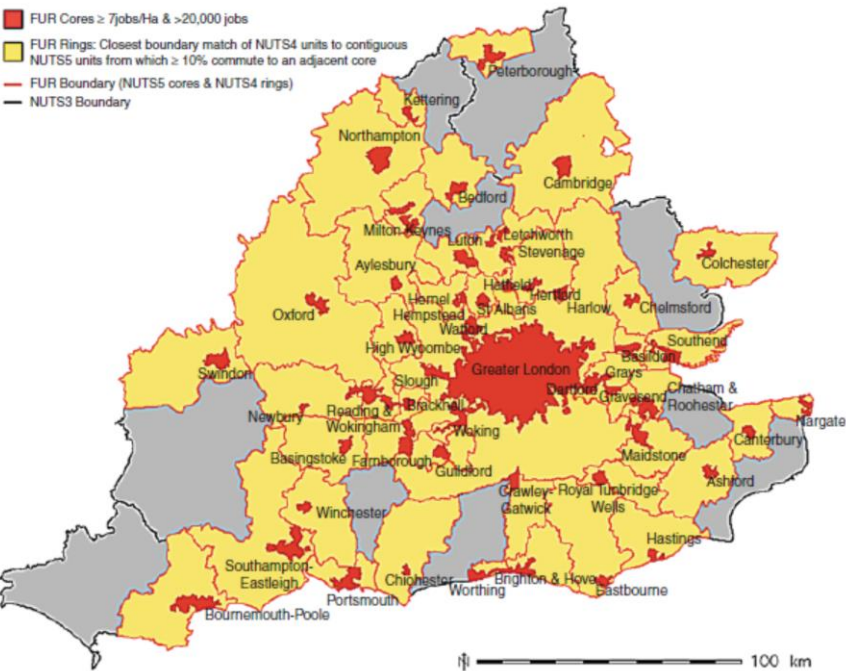
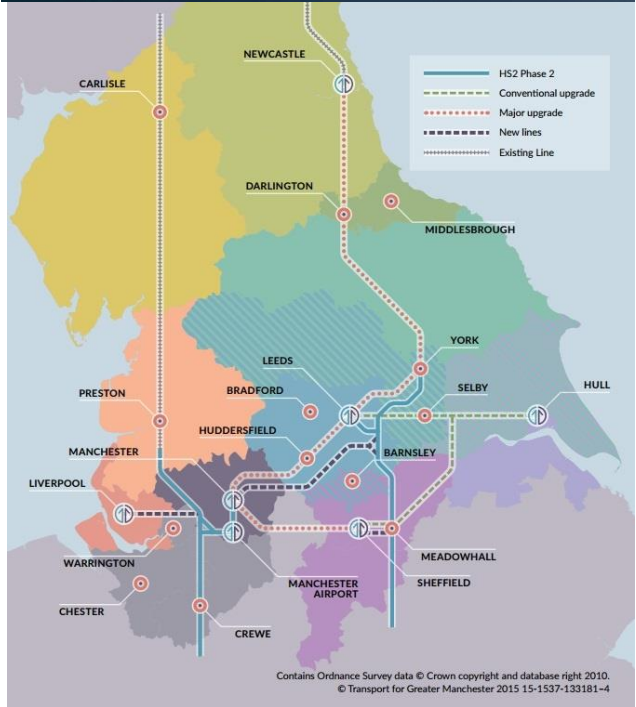
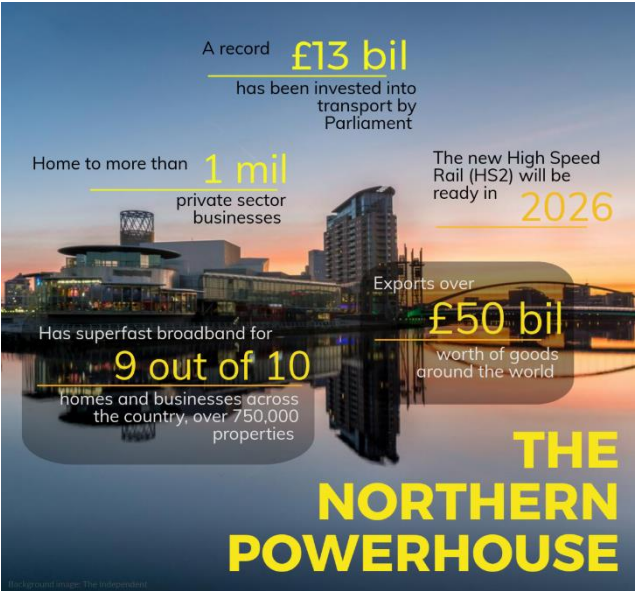


Fig. 5.1 South East England Mega-City Region: Constituent FURs. Source Hall/Green (2005: 4)



Contains Ordnance Survey data © Crown copyright and database right 2010.
© Transport for Greater Manchester 2015 15-1537-133181-4

The Asian/China Concept and Practice

City-cluster regions

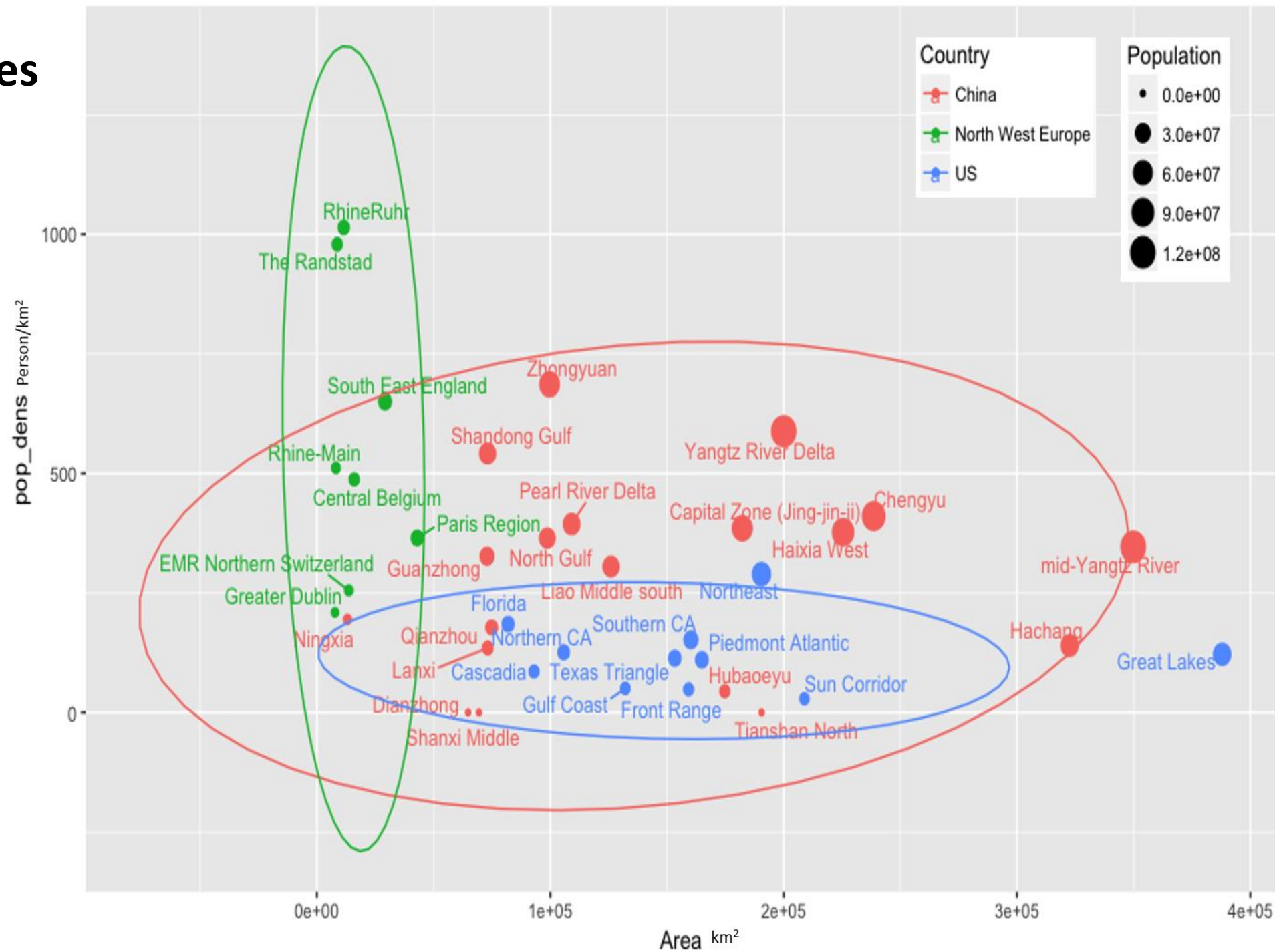
- Accentuated national spatial/urbanization strategy
- HSR investments to support city-cluster regions



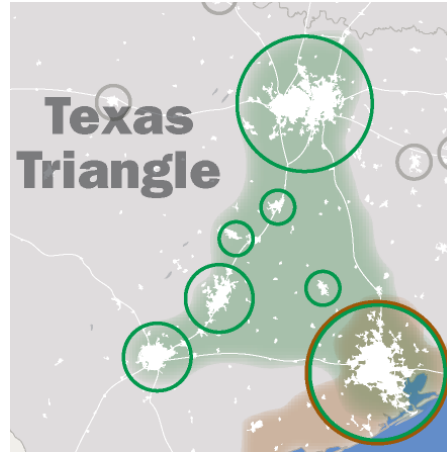
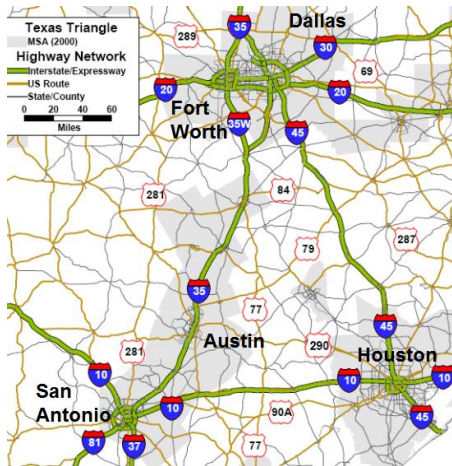
Railway map of People's Republic of China
Colored lines showing CRH and other
high speed rail services
Last update: 2018-01-15



World Cases



3. The Texas Triangle



The Texas Triangle:

A Geometric Coincidence or an Integrated Megaregion?

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SuperCities/Megaregion Workshop, Madrid, Spain, 2006

ABSTRACT

The Texas Triangle is formed by the metropolitan areas of Houston, Austin/San Antonio, and Dallas/Fort Worth. There have been debates on whether it is simply a geometric coincidence or an integrated megaregion. This paper presents a study on the economic complementarities and spatial interconnectedness of the Triangle metros. The study verifies empirically the existence of the Triangle megaregion. Theoretical and methodological issues on studying the megaregion are also explored.

demands for employment, education, health care, and other services. A third challenge is mobility. National mobility studies show that all of the metro areas in the Texas Triangle have been among the nation's top congested regions in the past two decades [5]. The region's transportation infrastructure needs major enhancement in order to keep people and goods moving within the region, cross the Texas-Mexican border, and along the NAFTA corridor.

To accommodate the anticipated vast growth in such a vast area,

Zhang, M. et. al. 2007

Five Dimensions of the Megaregional Process

-- A glance at the Texas Triangle

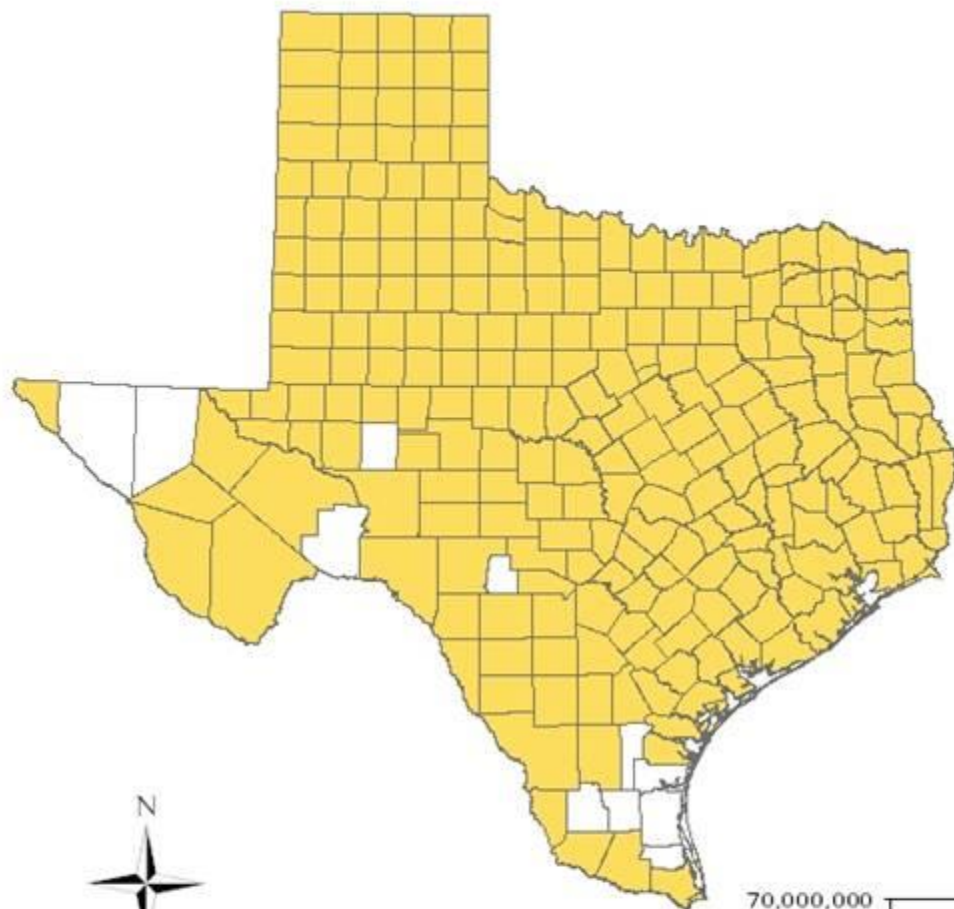
- 1. Interactively agglomerating**
- 2. Networked flowing**
- 3. Territorial re-sorting**
- 4. Competitive co-producing**
- 5. Identity forming**

1. Interactively agglomerating

- Networked flowing
- Territorial re-sorting
- Competitive co-producing, and
- Identity forming

Population Density

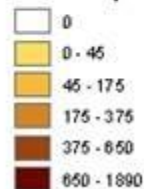
1900



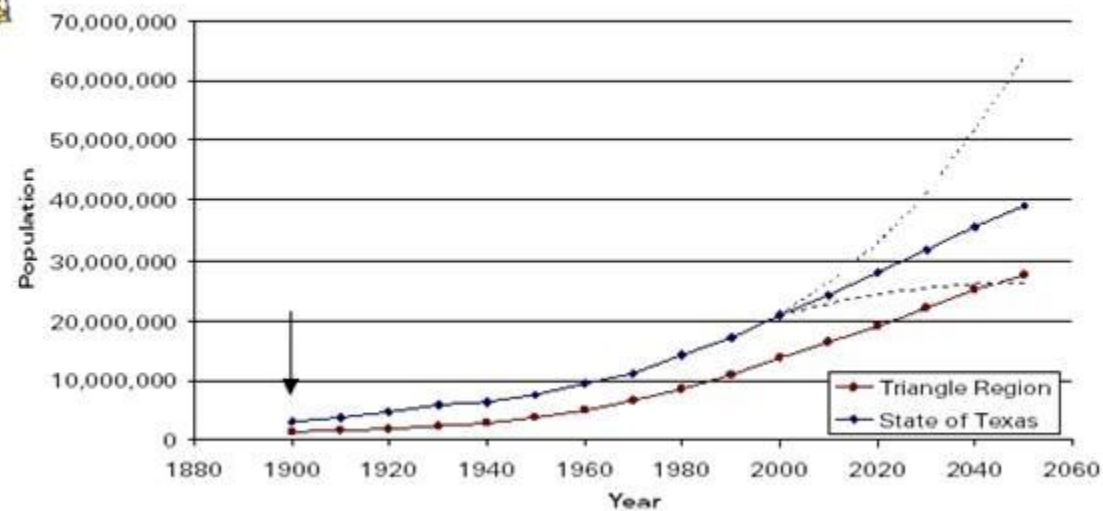
0 90 180 360 Miles
0 110 220 440 Kilometers

Legend

Population Density by County
Persons/Square Kilometer

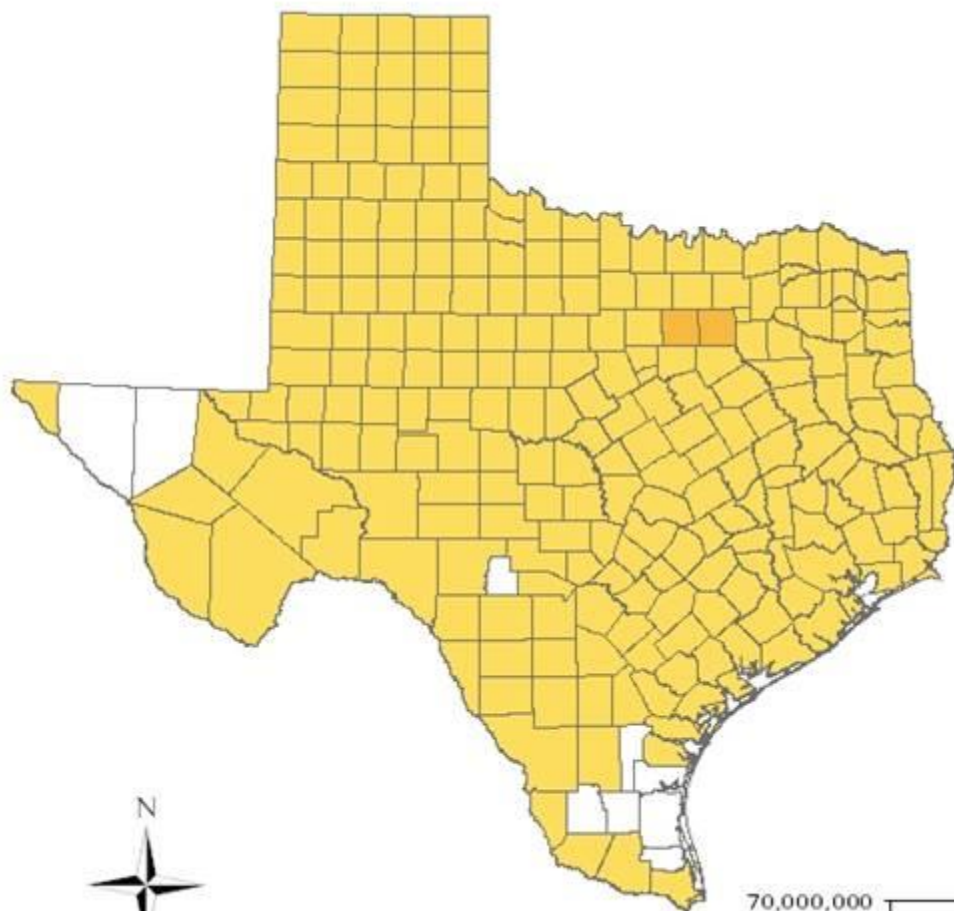


Population Growth for the State of Texas



Population Density

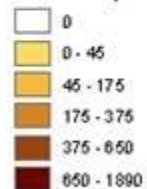
1910



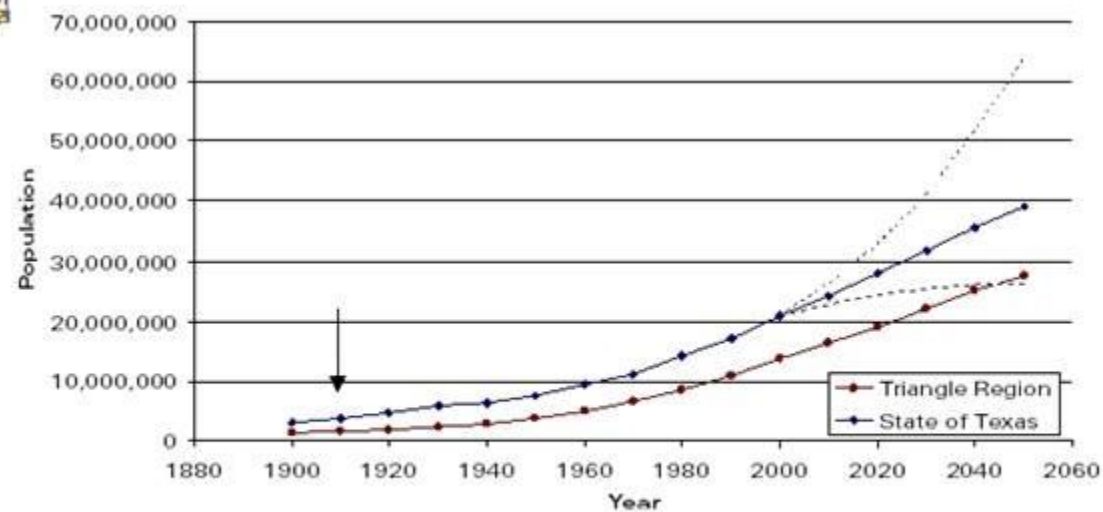
0 90 180 360 Miles
0 110 220 440 Kilometers

Legend

Population Density by County
Persons/Square Kilometer

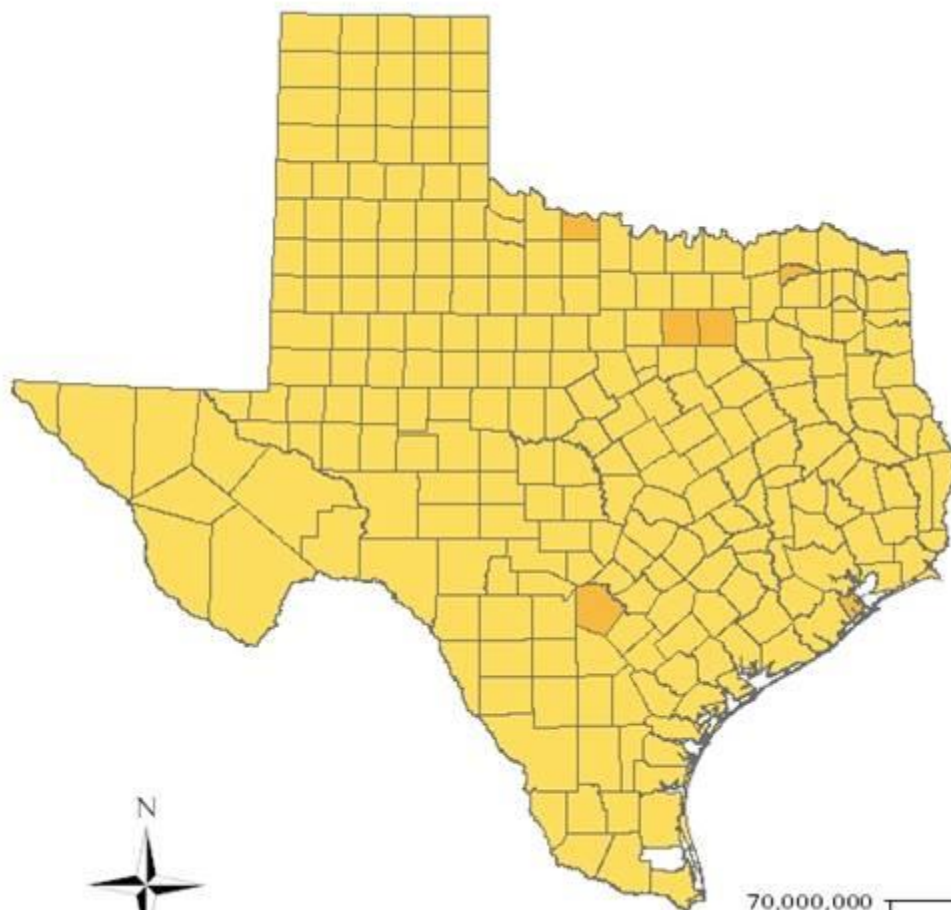


Population Growth for the State of Texas



Population Density

1920

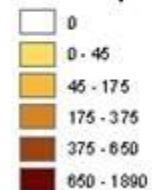


0 90 180 360 Miles
0 110 220 440 Kilometers

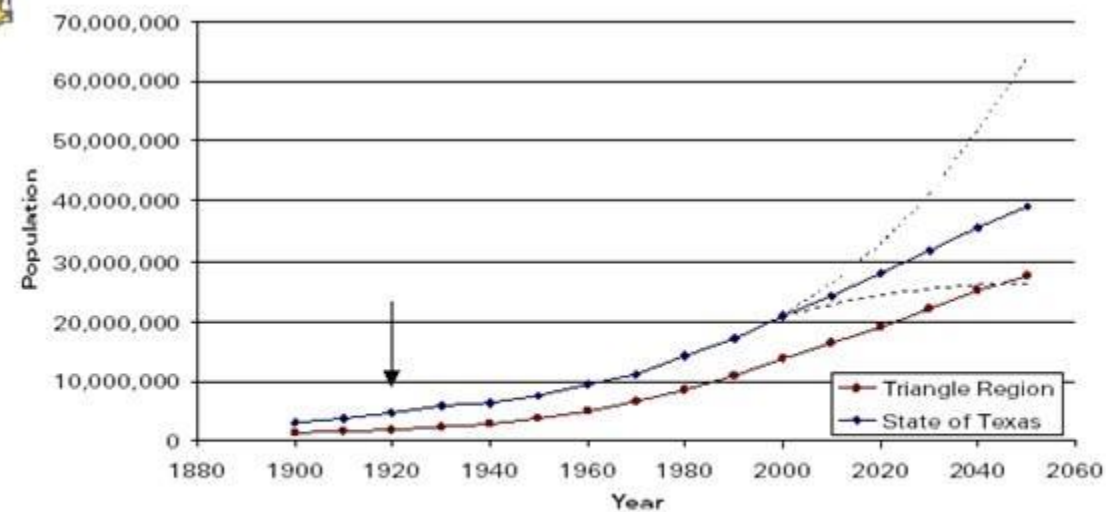
Legend

Population Density by County

Persons/Square Kilometer

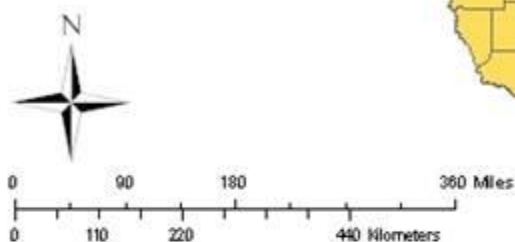
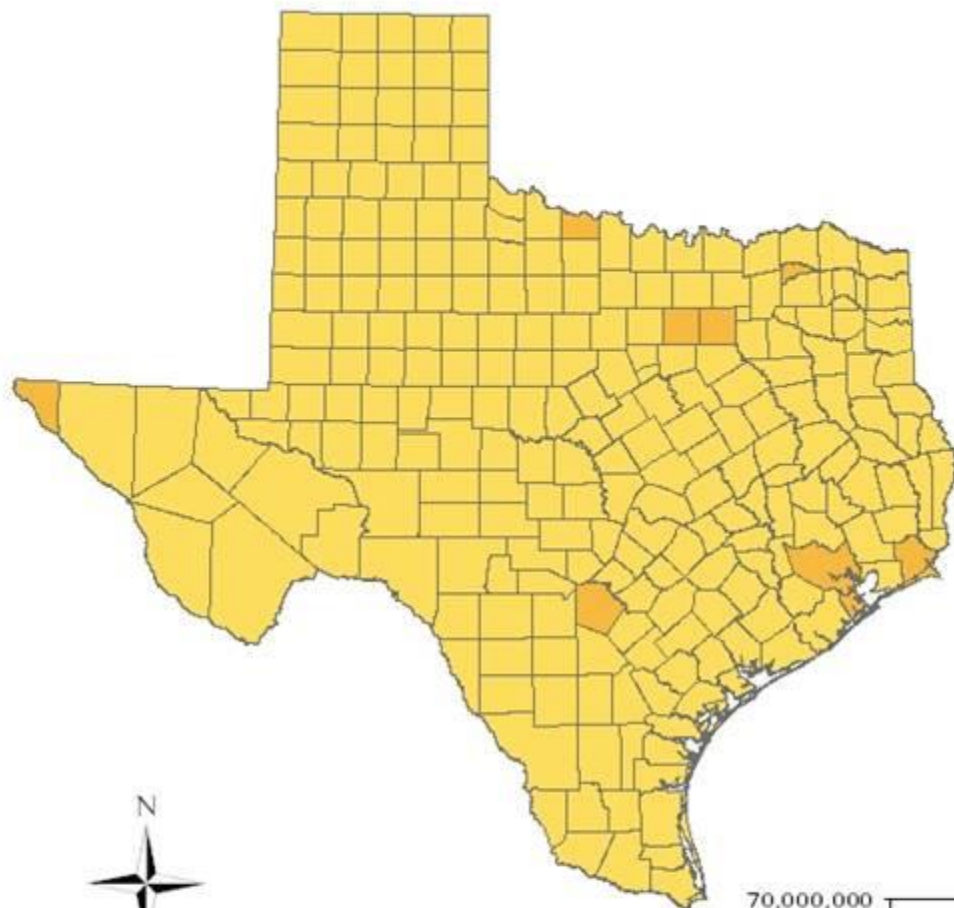


Population Growth for the State of Texas

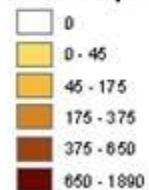


Population Density

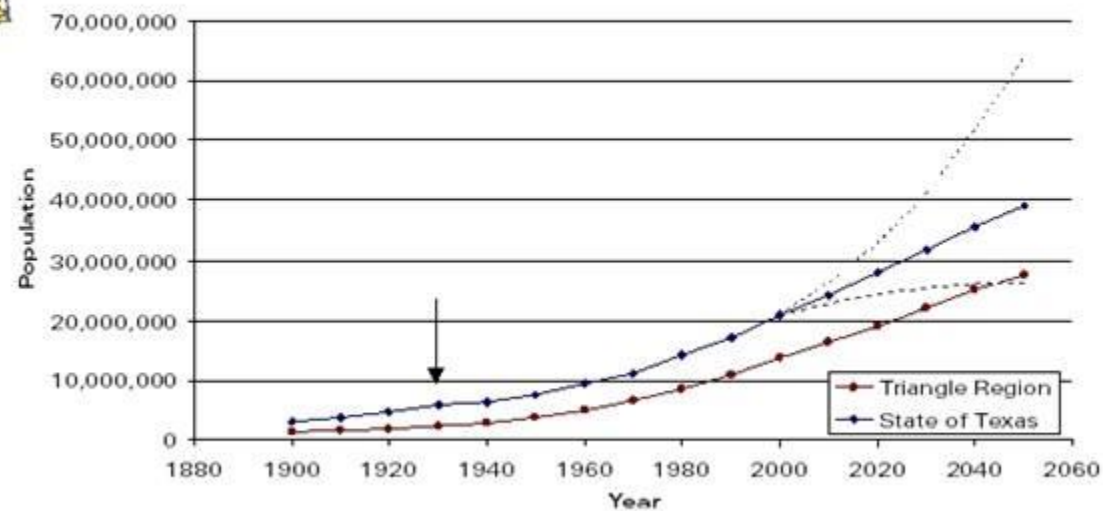
1930



Legend
Population Density by County
Persons/Square Kilometer

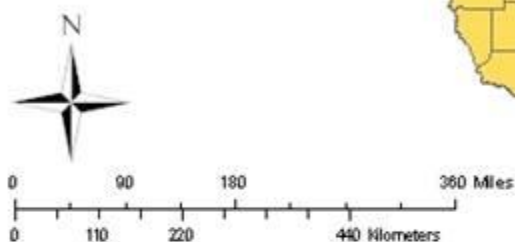
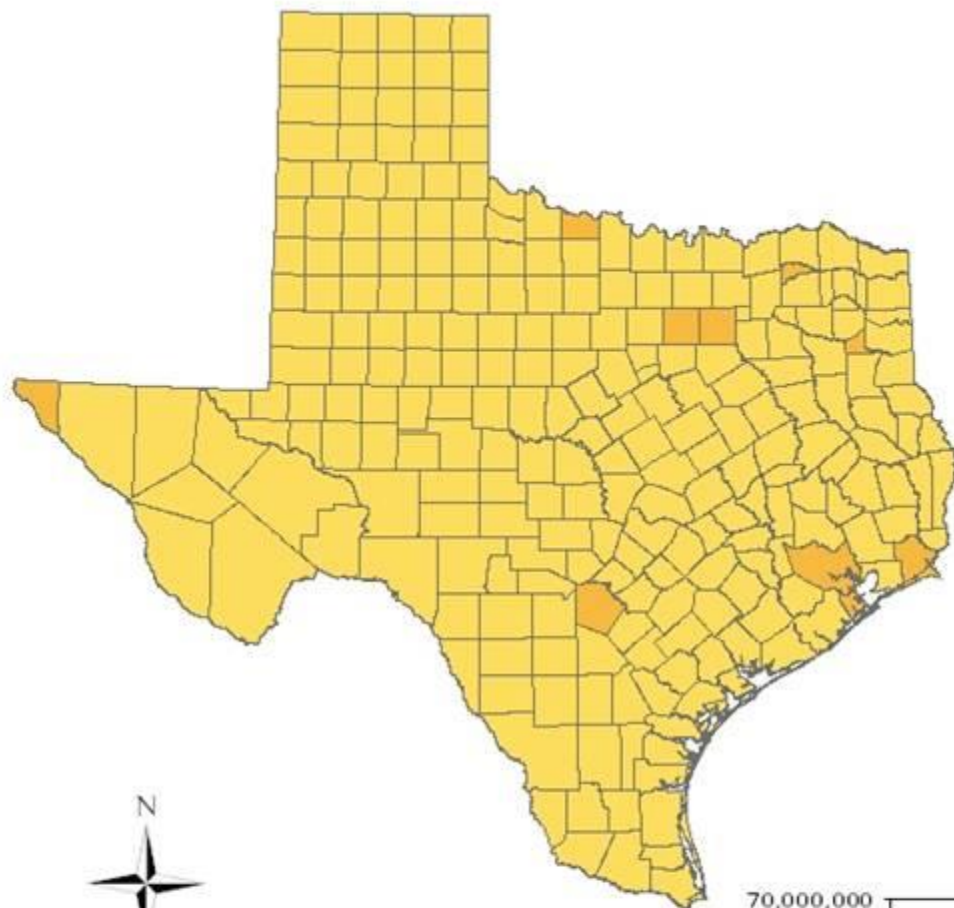


Population Growth for the State of Texas

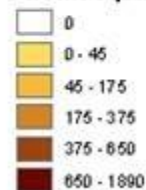


Population Density

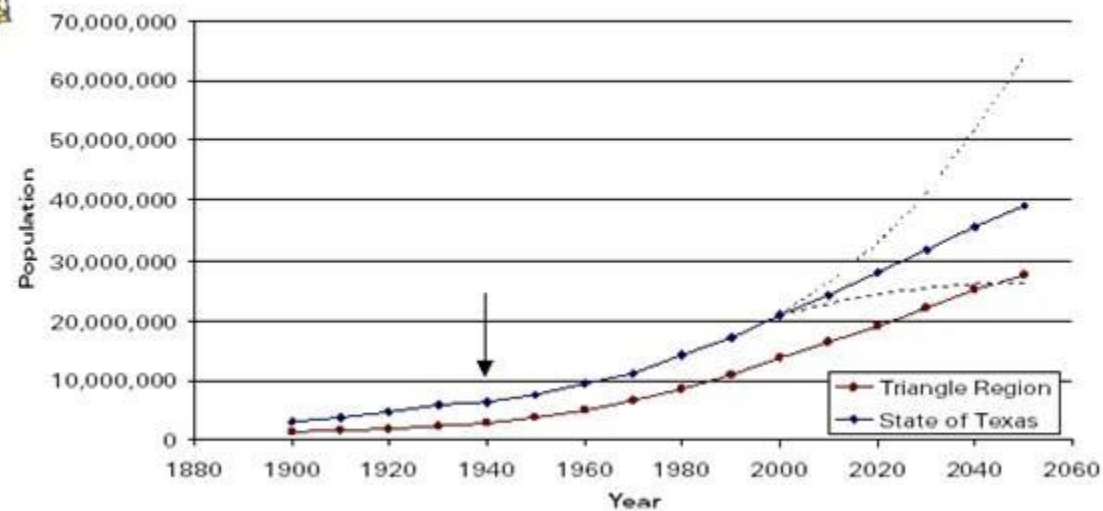
1940



Legend
Population Density by County
Persons/Square Kilometer

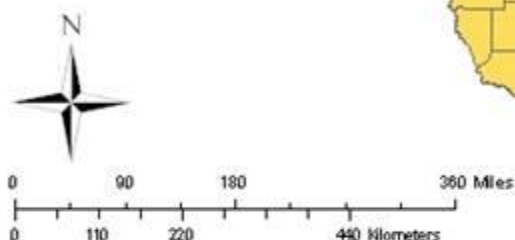
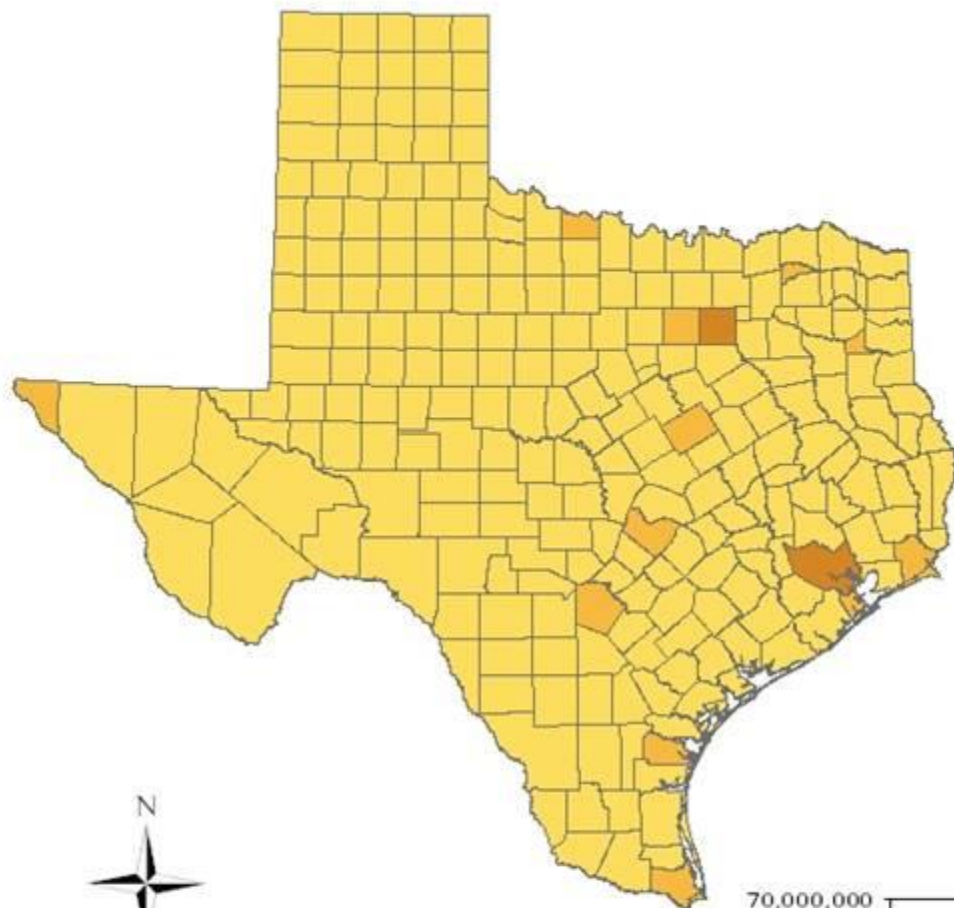


Population Growth for the State of Texas

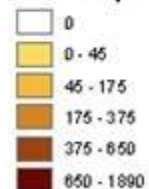


Population Density

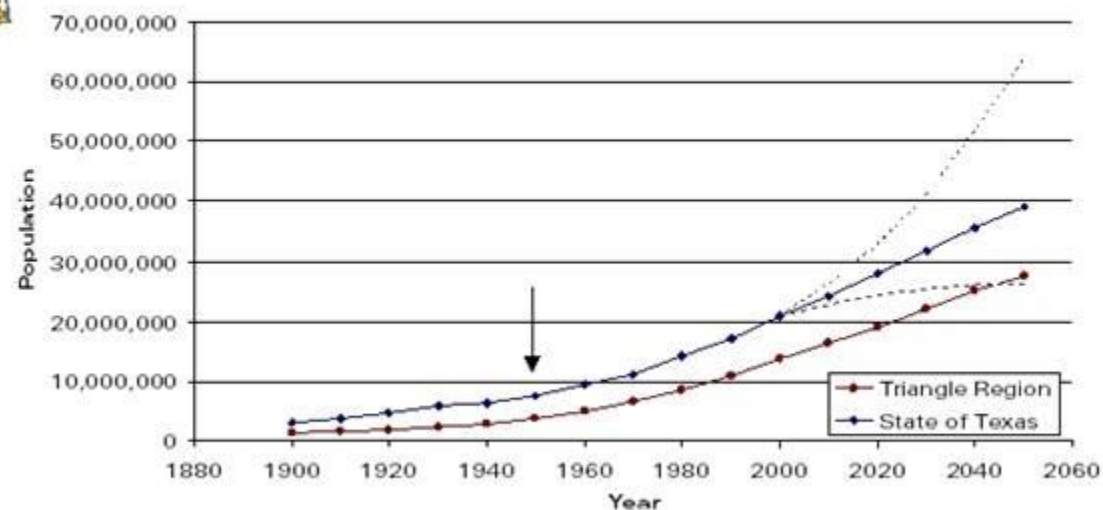
1950



Legend
Population Density by County
Persons/Square Kilometer

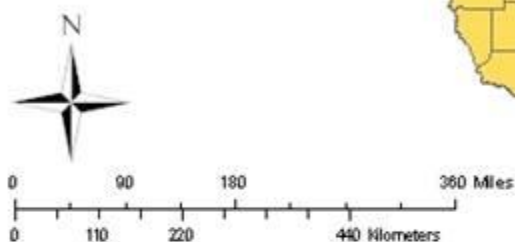
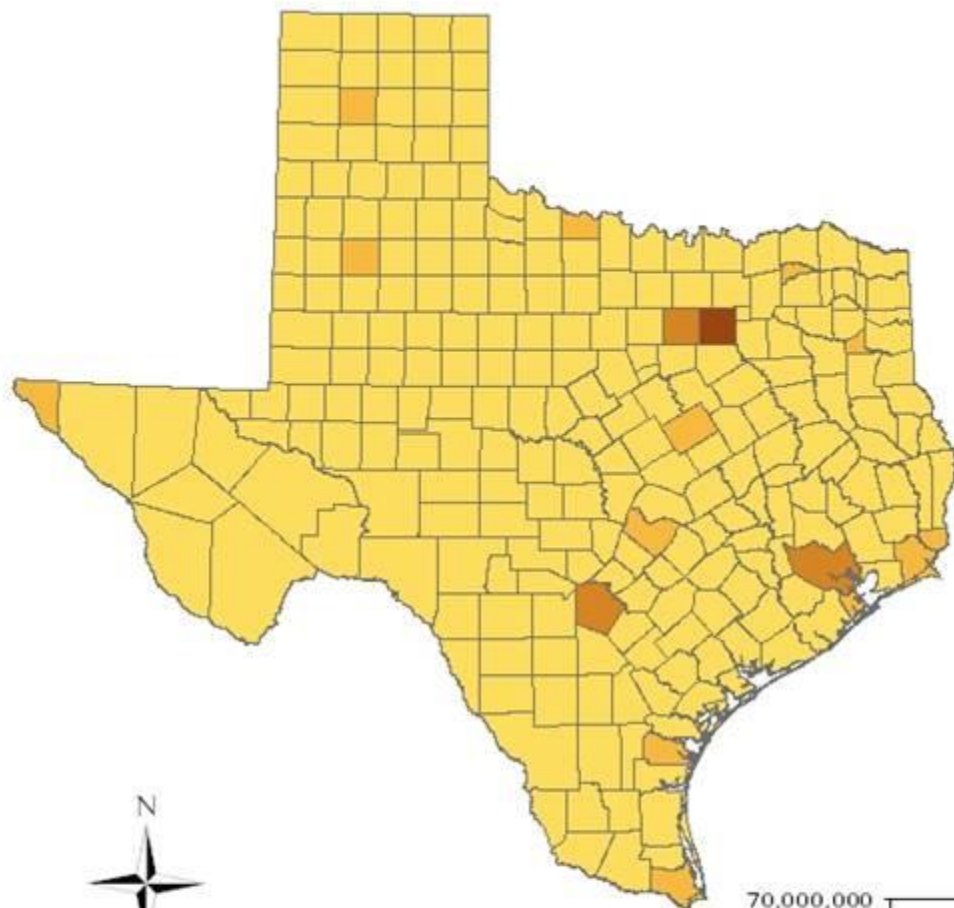


Population Growth for the State of Texas

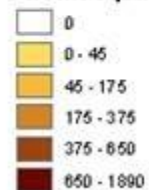


Population Density

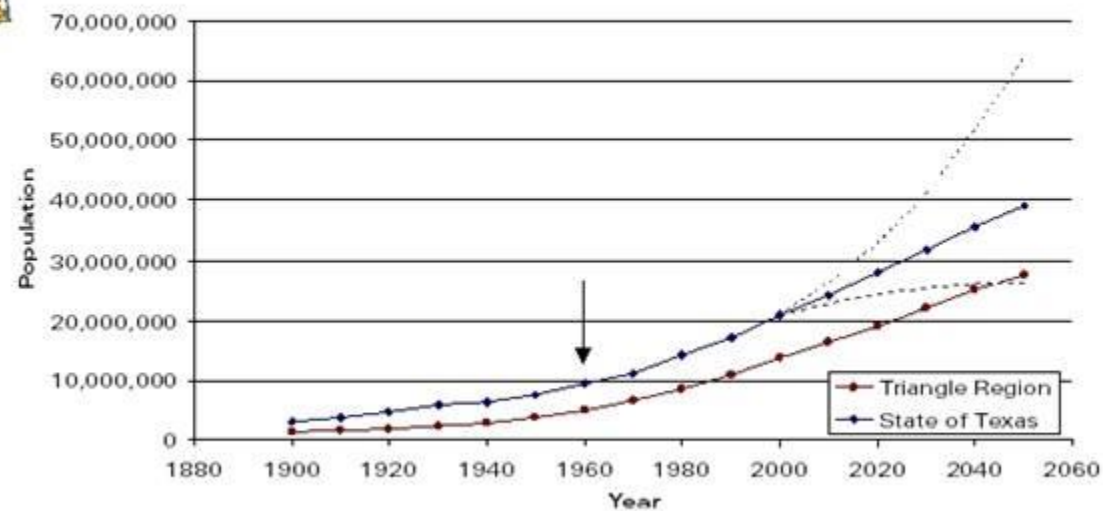
1960



Legend
Population Density by County
Persons/Square Kilometer

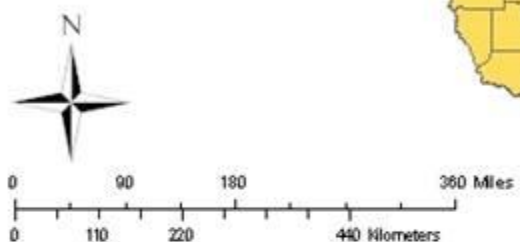
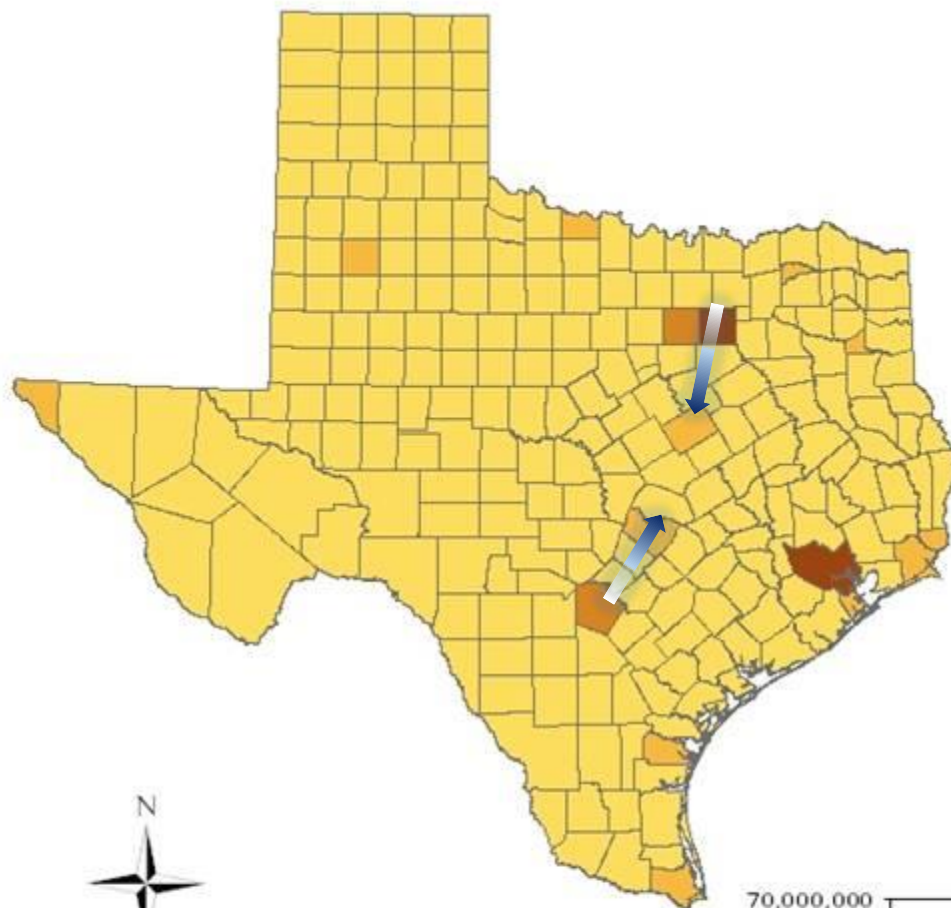


Population Growth for the State of Texas

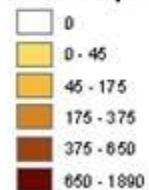


Population Density

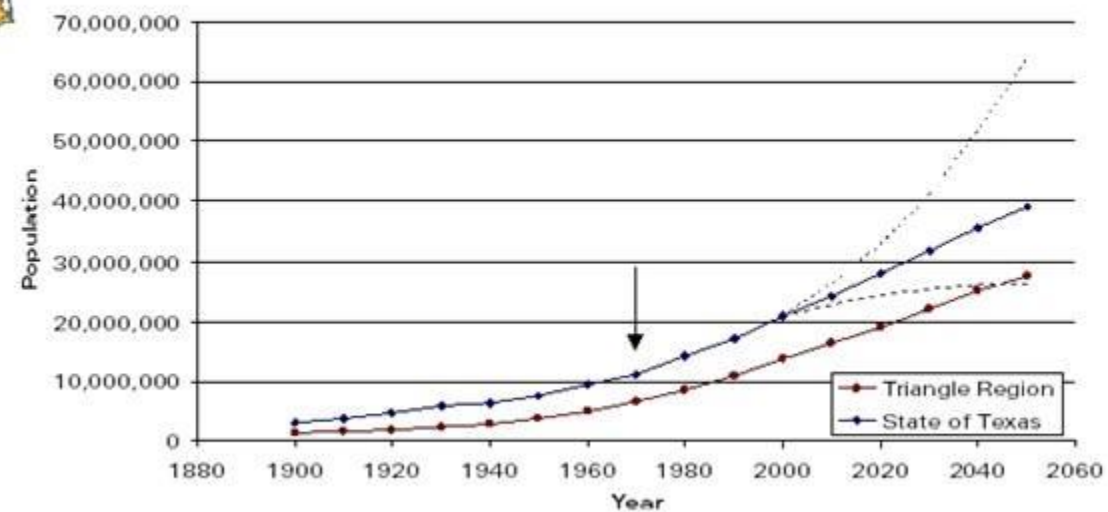
1970



Legend
Population Density by County
Persons/Square Kilometer

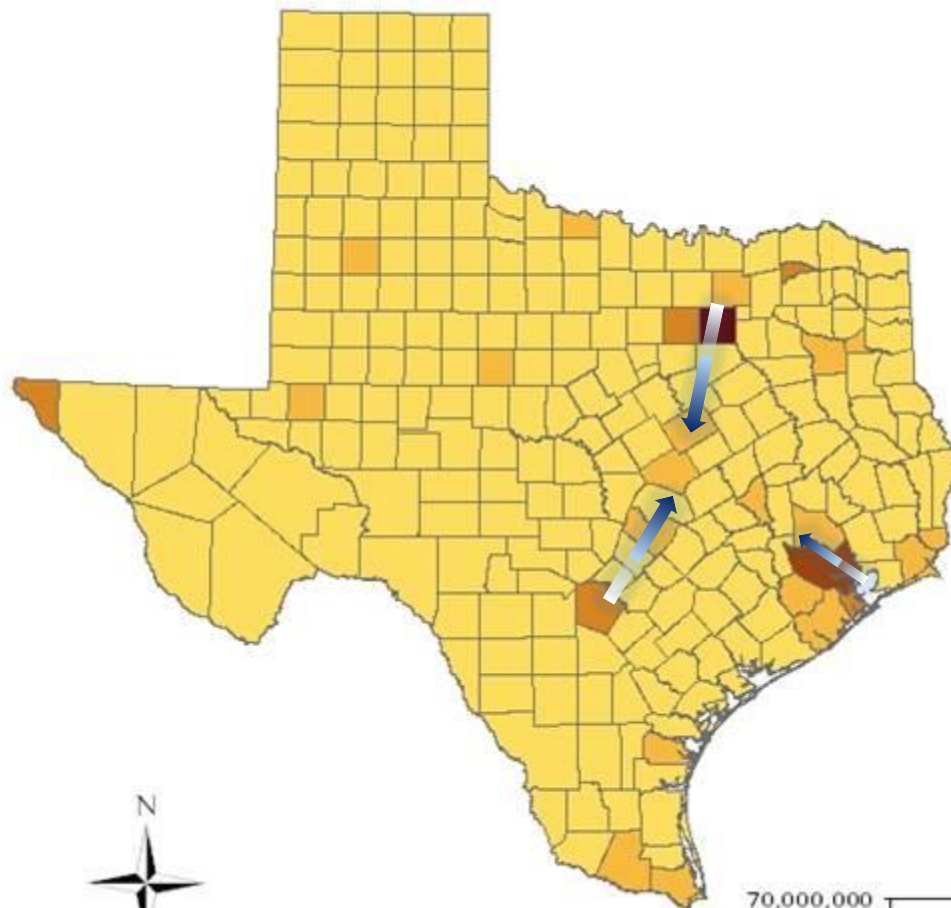


Population Growth for the State of Texas



Population Density

1980

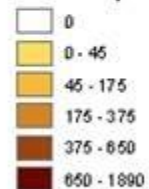


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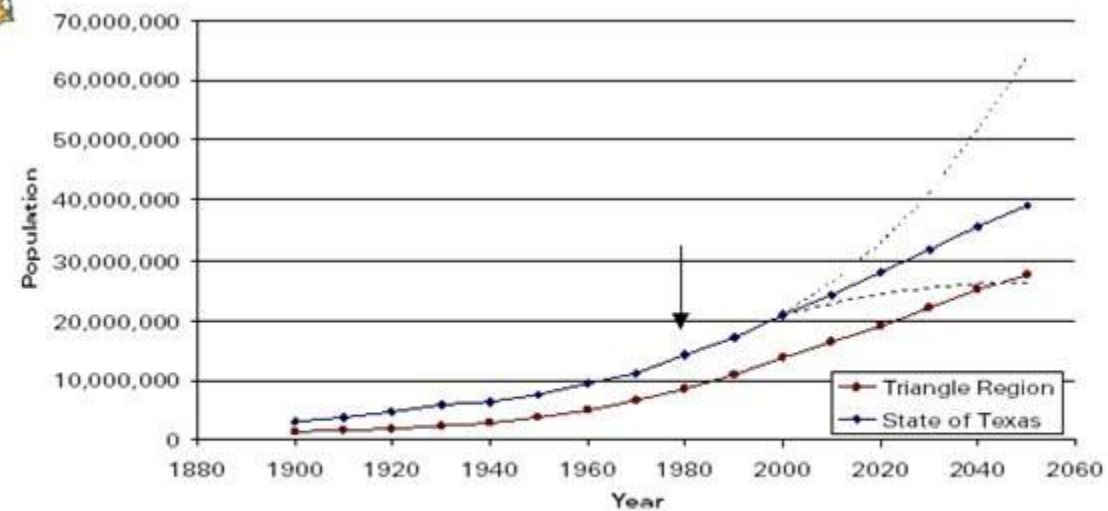
Legend

Population Density by County

Persons/Square Kilometer

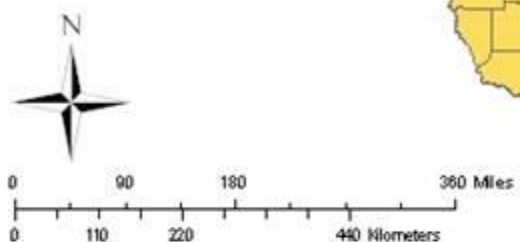
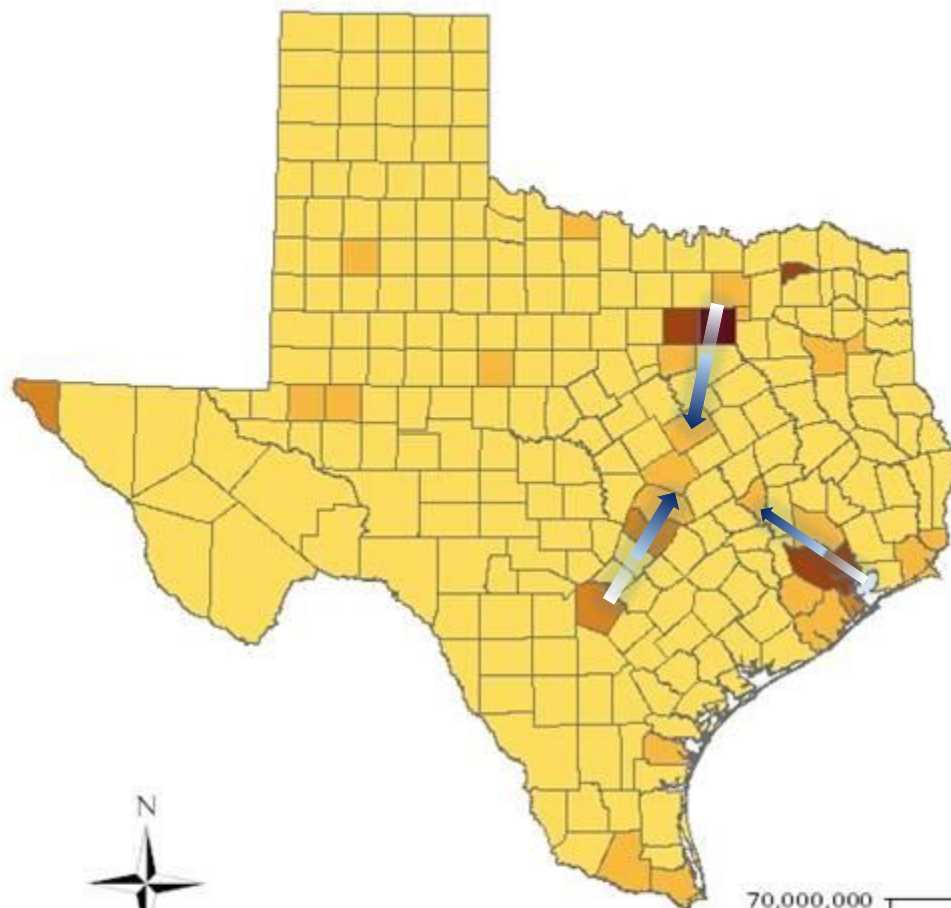


Population Growth for the State of Texas

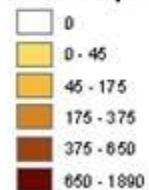


Population Density

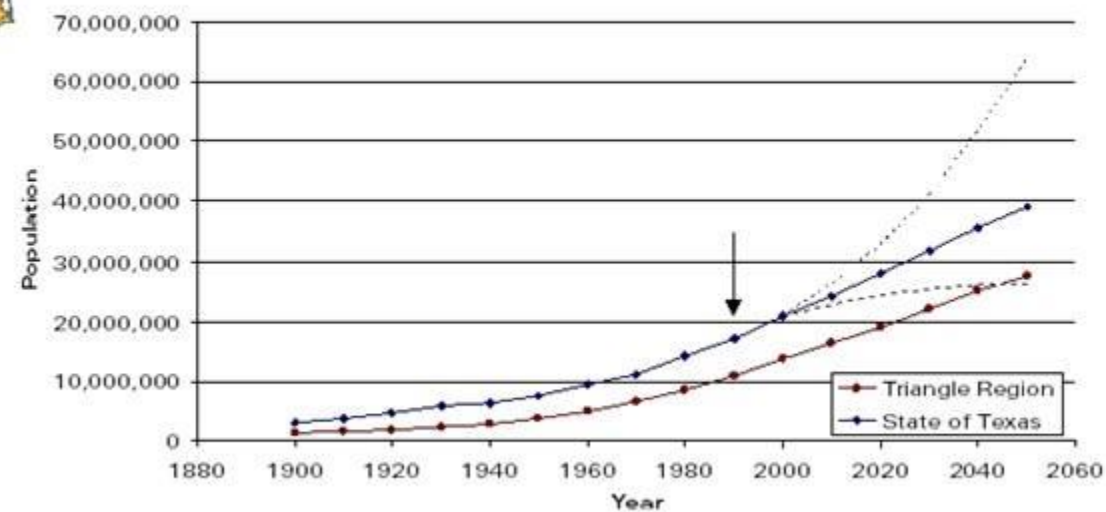
1990



Legend
Population Density by County
Persons/Square Kilometer

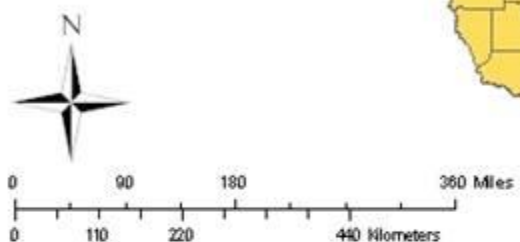
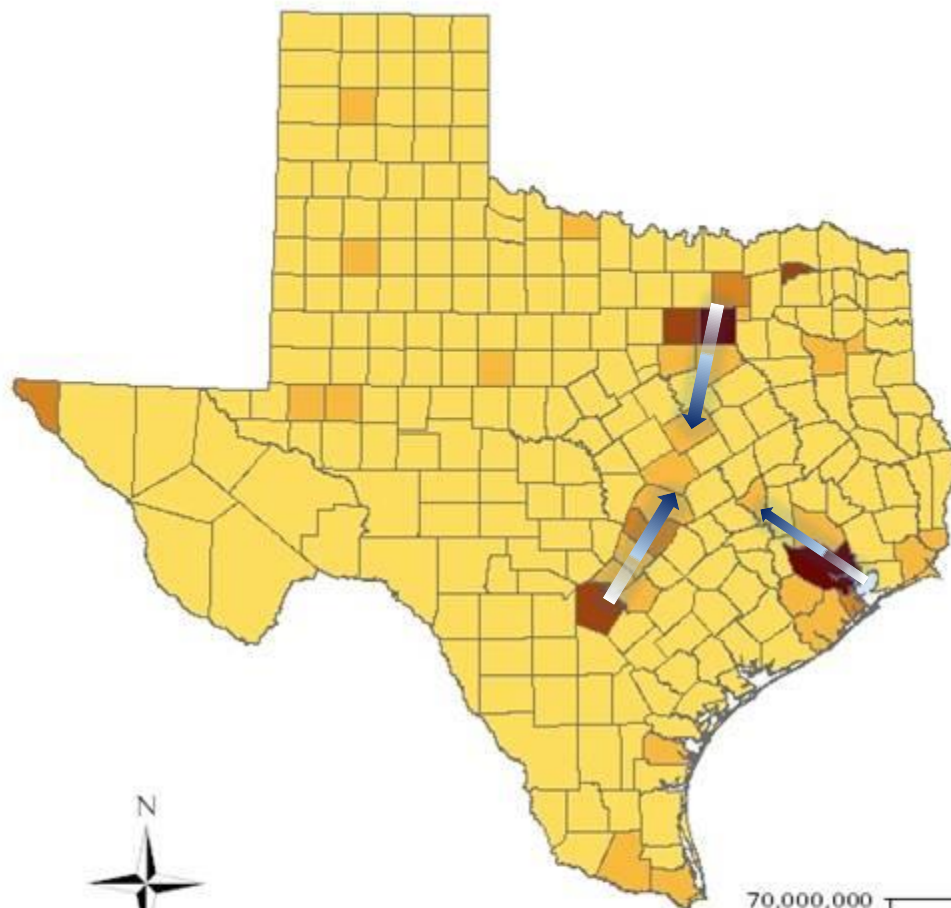


Population Growth for the State of Texas

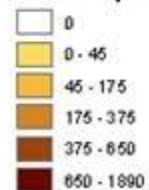


Population Density

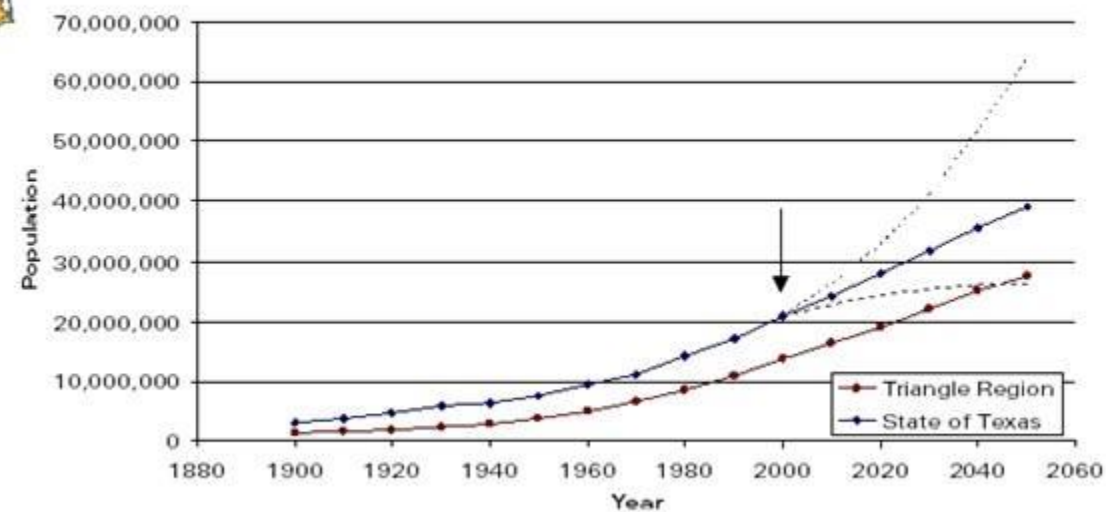
2000



Legend
Population Density by County
Persons/Square Kilometer

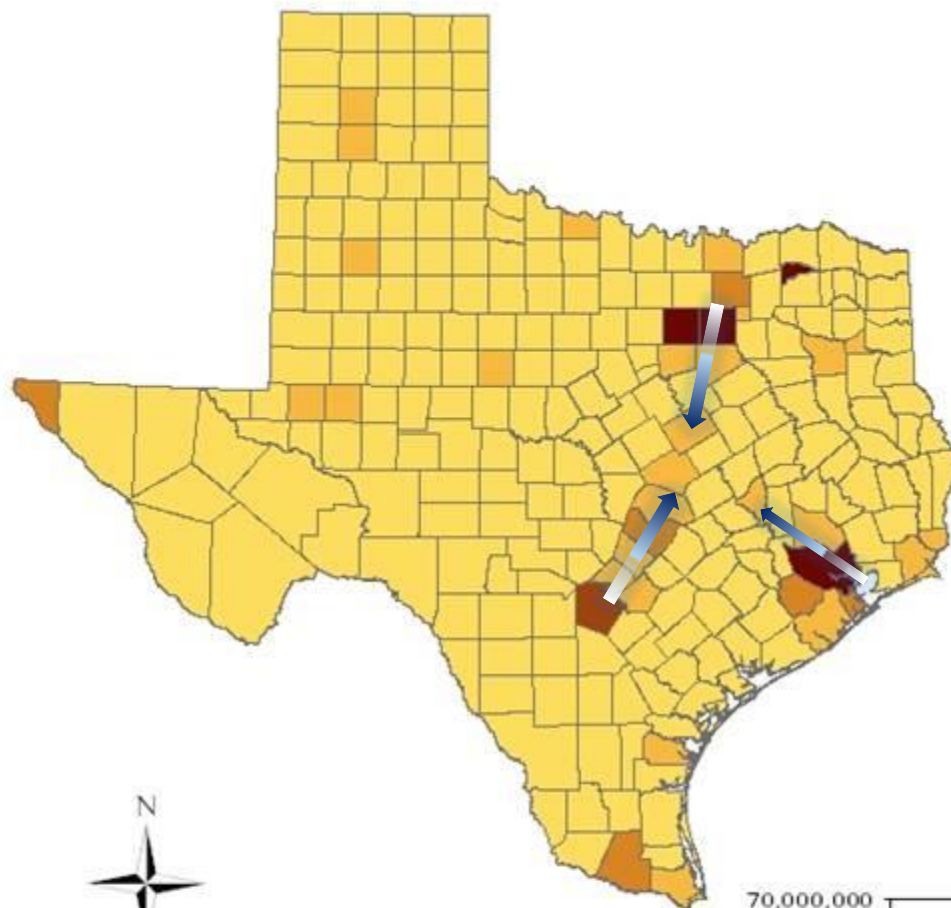


Population Growth for the State of Texas



Population Density

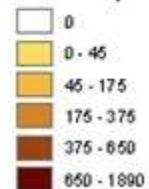
2010



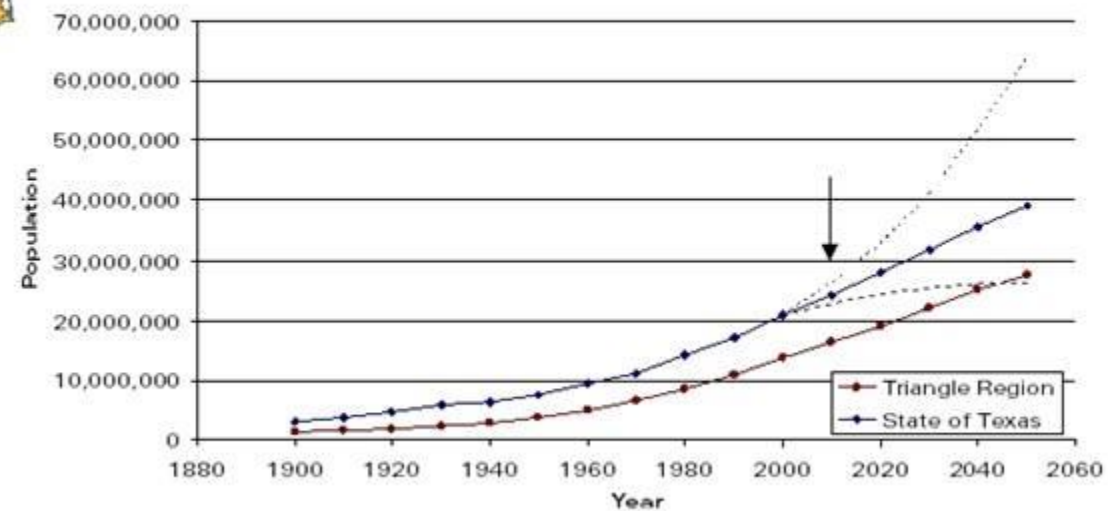
0 90 180 360 Miles
0 110 220 440 Kilometers

Legend

Population Density by County
Persons/Square Kilometer

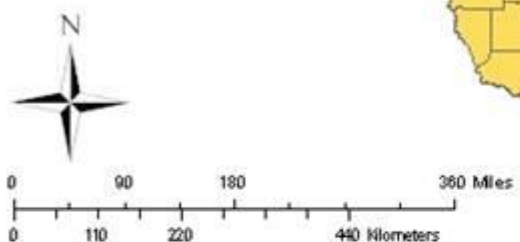
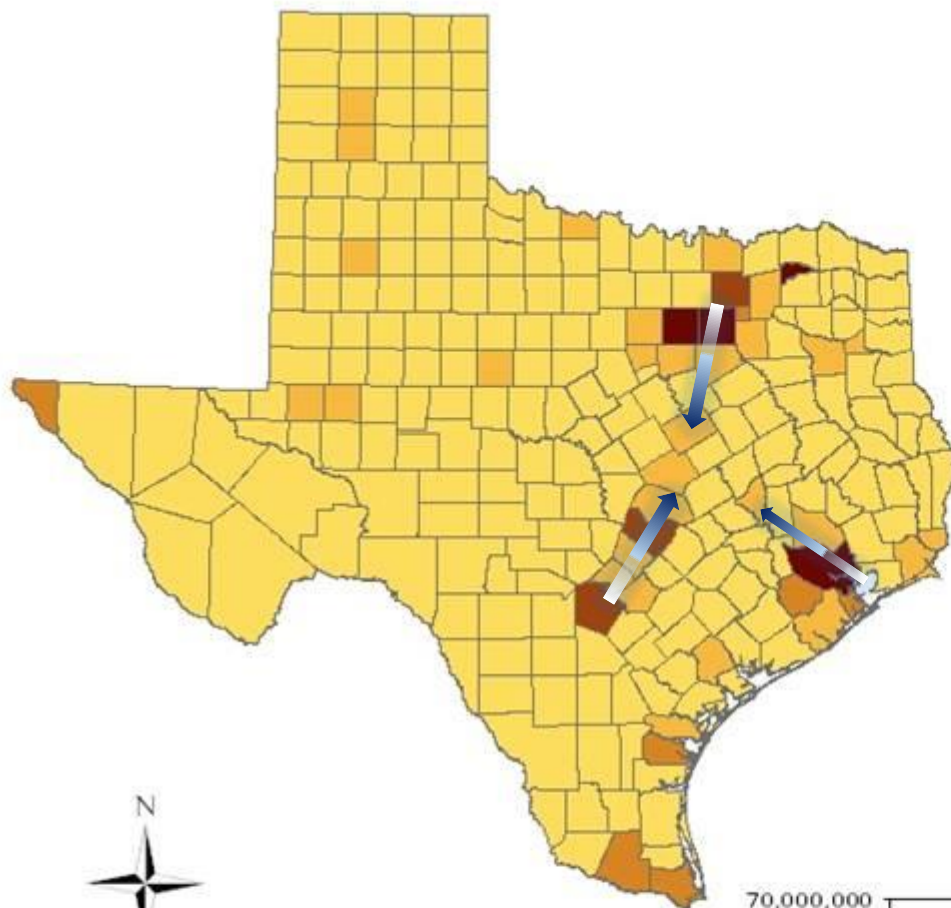


Population Growth for the State of Texas

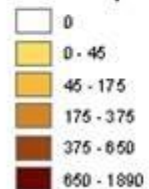


Population Density

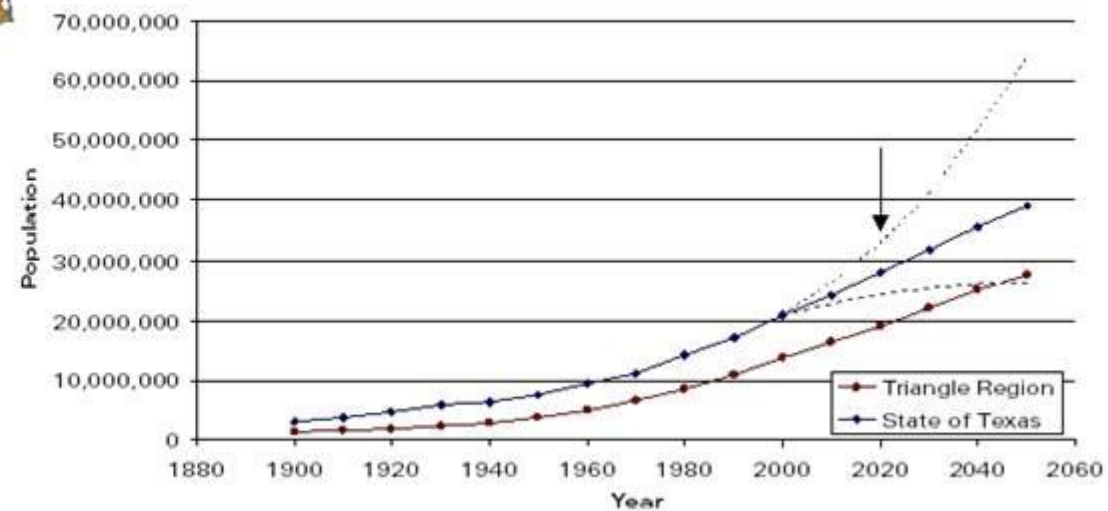
2020



Legend
Population Density by County
Persons/Square Kilometer

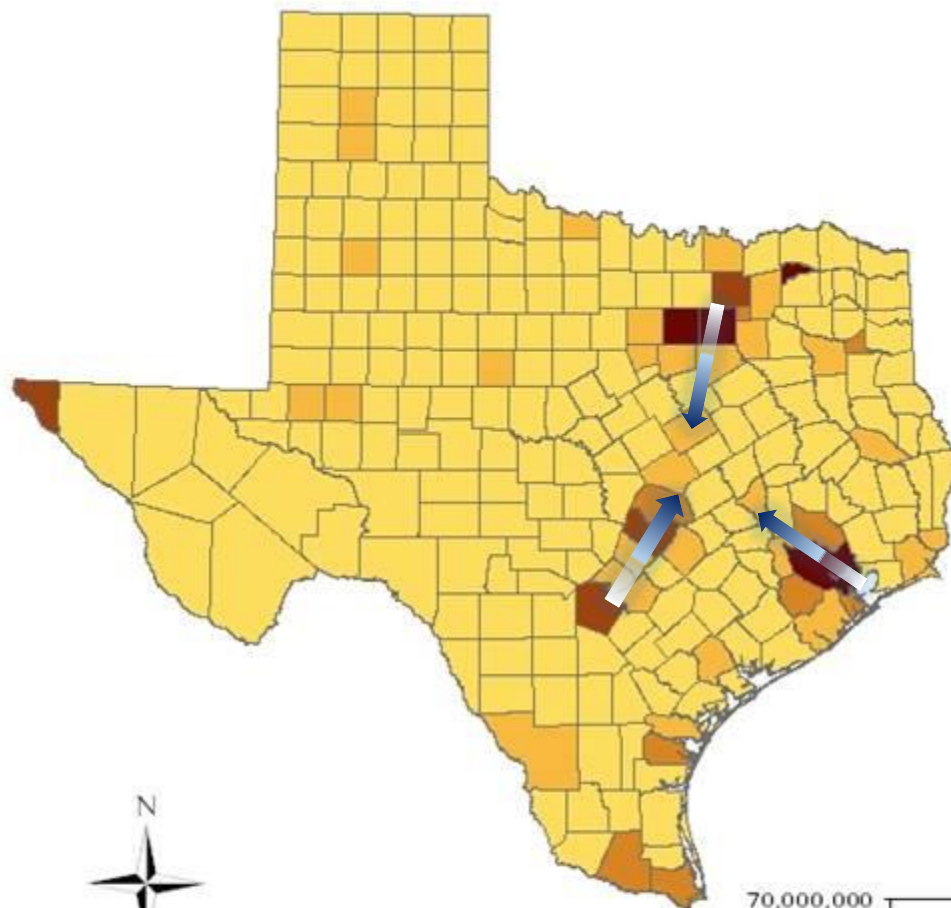


Population Growth for the State of Texas



Population Density

2030

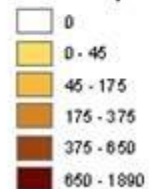


0 90 180 360 Miles
0 110 220 440 Kilometers

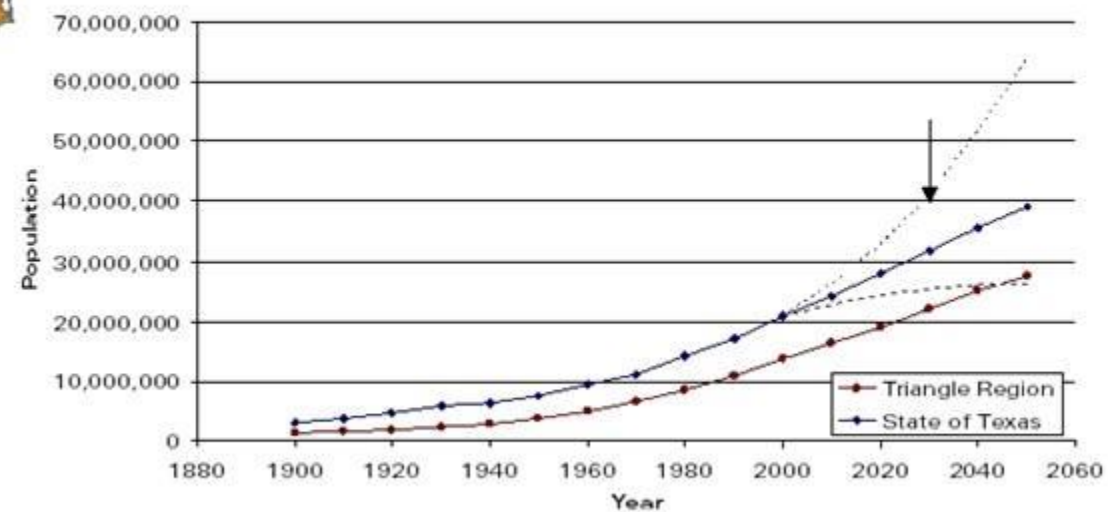
Legend

Population Density by County

Persons/Square Kilometer

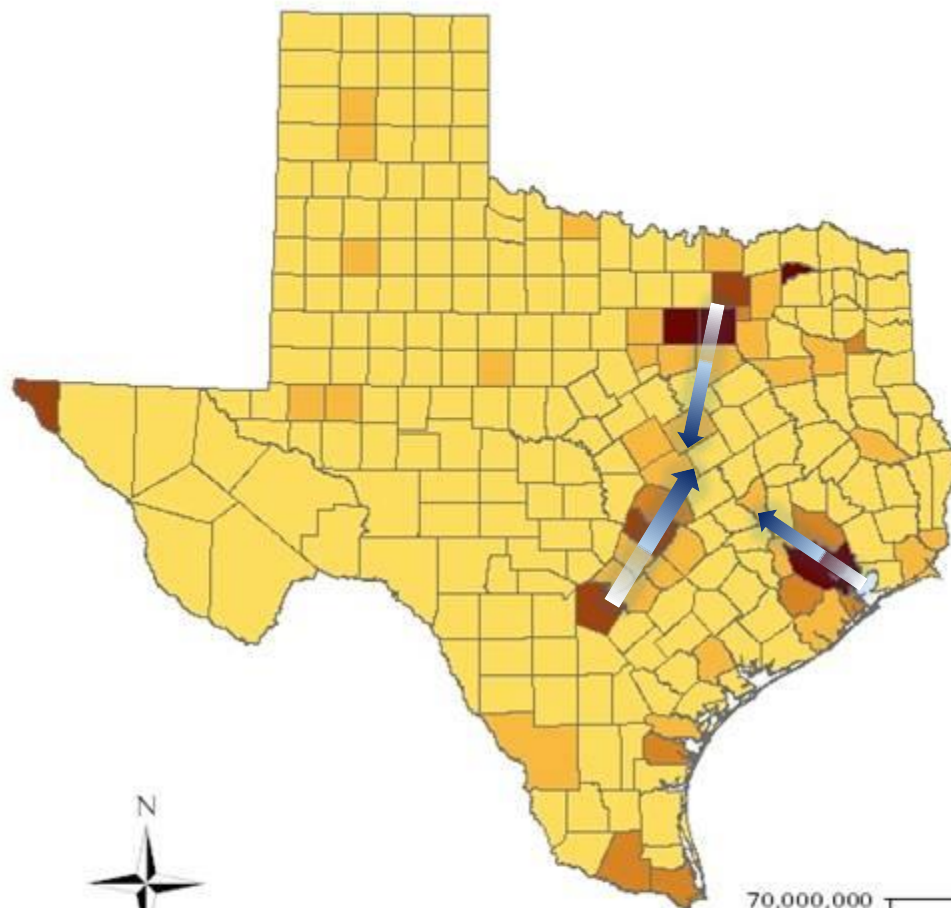


Population Growth for the State of Texas



Population Density

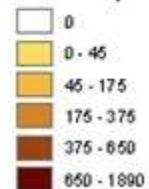
2040



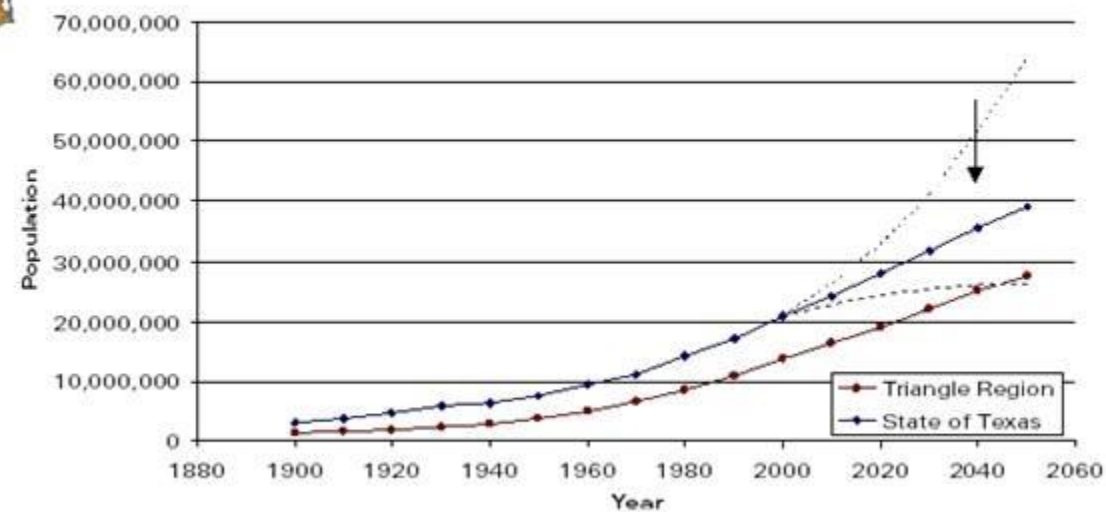
Legend

Population Density by County

Persons/Square Kilometer

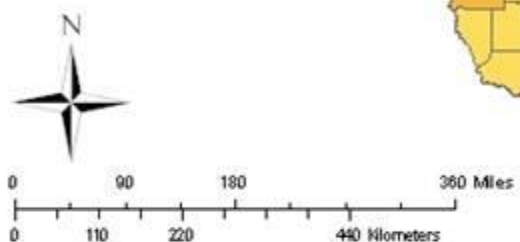
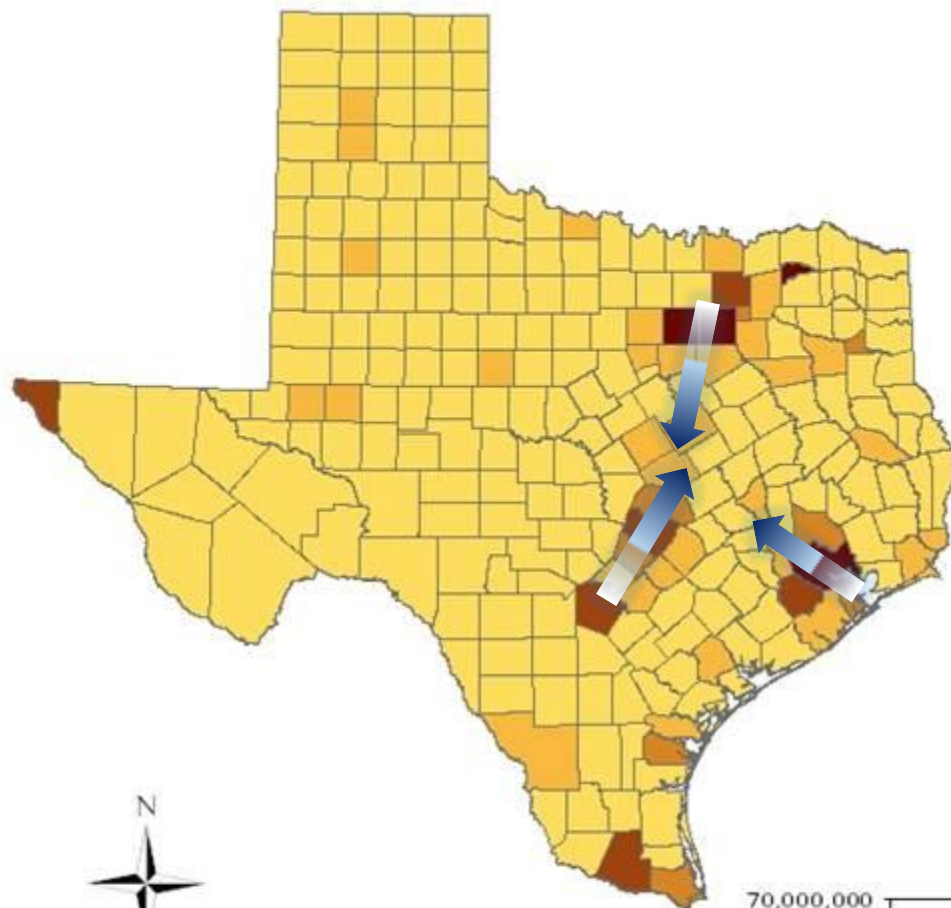


Population Growth for the State of Texas

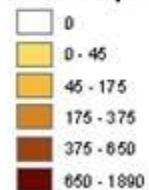


Population Density

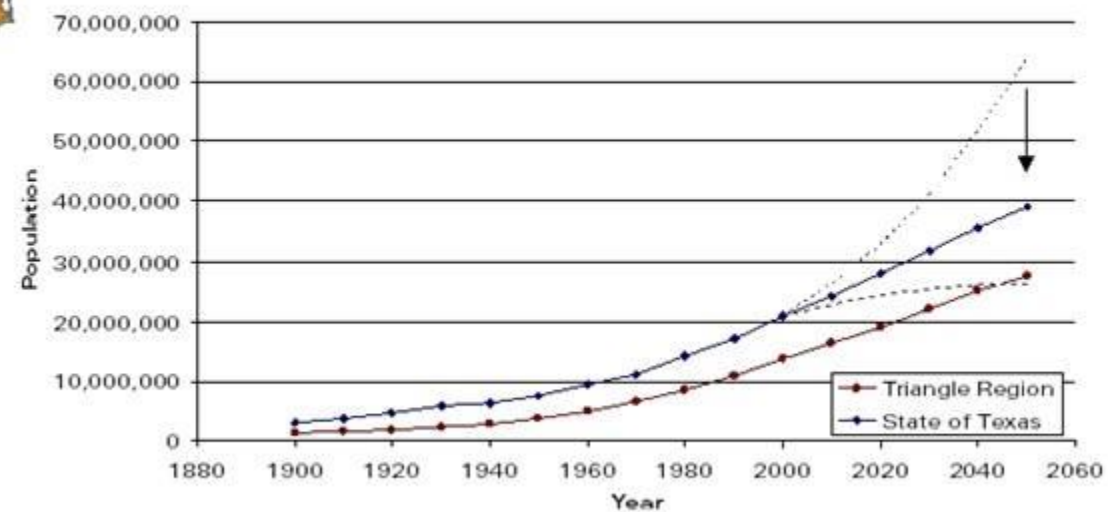
2050



Legend
Population Density by County
Persons/Square Kilometer



Population Growth for the State of Texas



Census estimates hint at mega-region between San Antonio and Austin

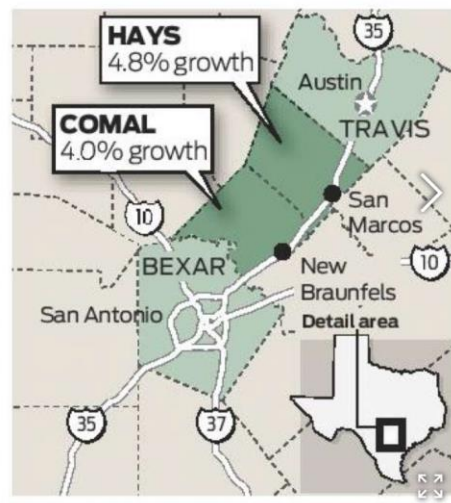


Vianna Davila | March 26, 2015

The 10 fastest-growing U.S. counties

Of 10,000 or more population, July 1, 2013, to July 1, 2014

RANK	COUNTY	PERCENT CHANGE
1.	Williams, N.D.	8.7
2.	Stark, N.D.	7.0
3.	Sumter, Fla.	5.4
4.	Pickens, Ala.	5.1
5.	Hays	4.8
6.	Fort Bend	4.7
7.	Forsyth, Ga.	4.6
8.	Wasatch, Utah	4.3
9.	Comal	4.0
10.	Morgan, Utah	4.0



Fastest-growing metro areas

July 1, 2013, to July 1, 2014

RANK	METRO AREA	PERCENT CHANGE
1.	The Villages, Fla.	5.4
2.	Myrtle Beach-Conway-N. Myrtle Beach, S.C.-N.C	3.2
3.	Austin-Round Rock	3.0
4.	Odessa	2.9
5.	St. George, Utah	2.9
6.	Cape Coral-Fort Myers, Fla	2.7
7.	Bend-Redmond, Ore	2.7
8.	Greeley, Colo	2.6
9.	Midland	2.6
10.	Naples-Immokalee-Marco Island, Fla	2.5
11.	Houston-The Woodlands-Sugar Land	2.5
24.	San Antonio-New Braunfels	2.0

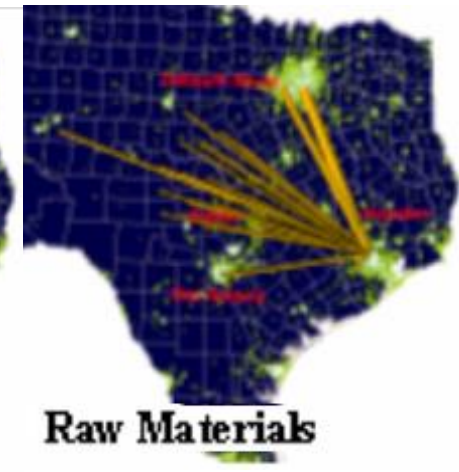
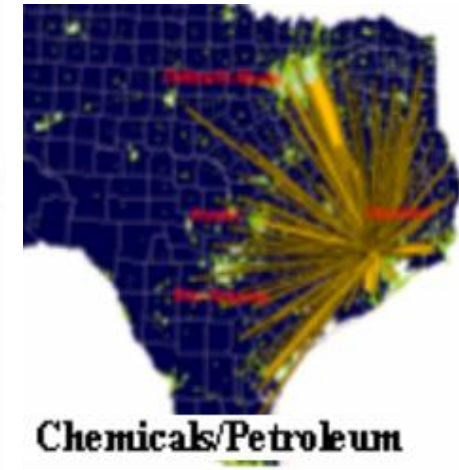
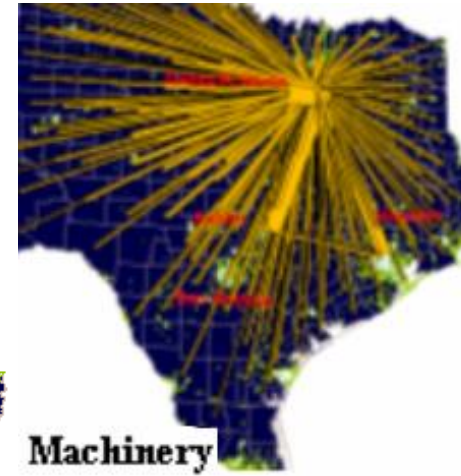
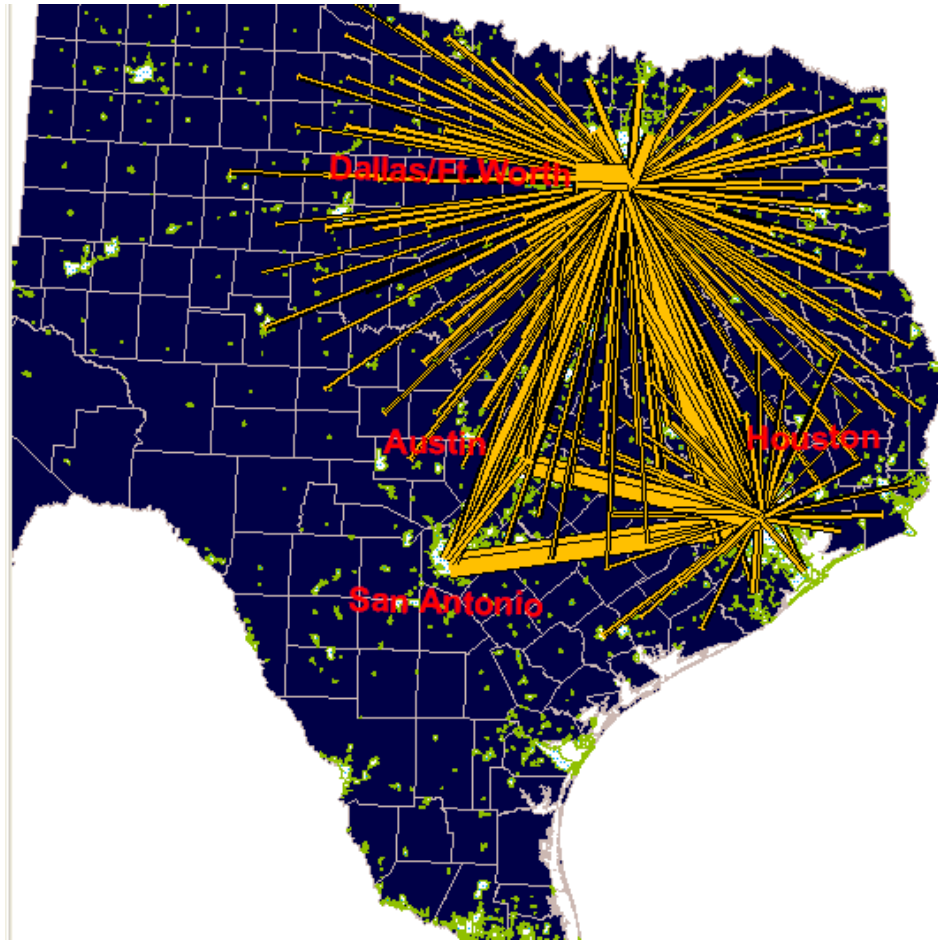
The 10 counties with the largest population increase

July 1, 2013, to July 1, 2014

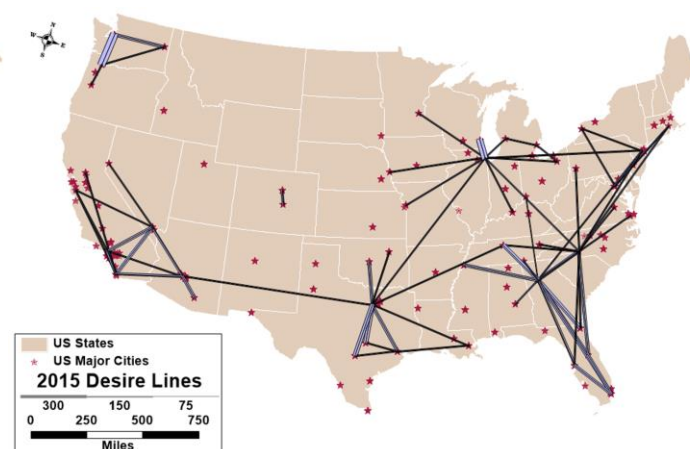
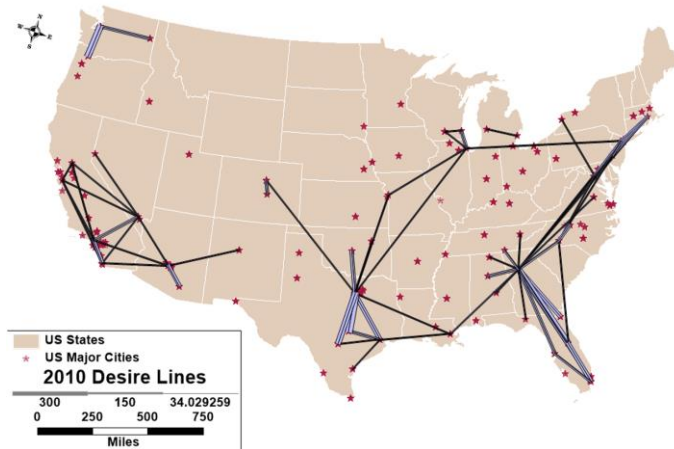
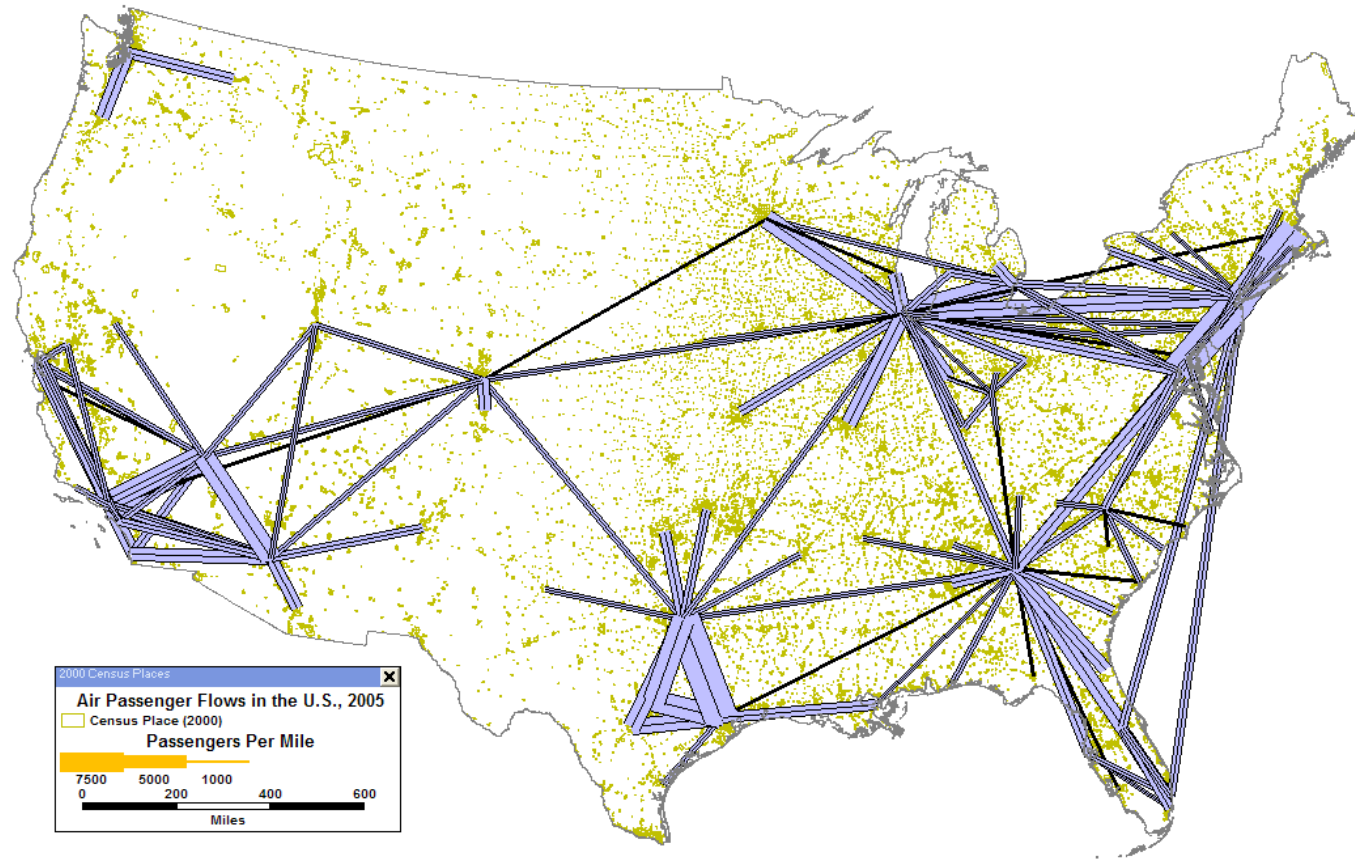
RANK	COUNTY	INCREASE
1.	Harris (Houston)	89,000
2.	Maricopa, Ariz. (Phoenix)	74,000
3.	Los Angeles, Calif.	63,000
4.	San Diego, Calif.	41,000
5.	Clark, Nev. (Las Vegas)	40,000
6.	Bexar (San Antonio)	34,000
7.	King, Wash. (Seattle)	33,000
8.	Dallas	33,000
9.	Riverside, Calif.	32,000
10.	Tarrant (Fort Worth)	31,000

2. Networked flowing

Freight flows by trucks

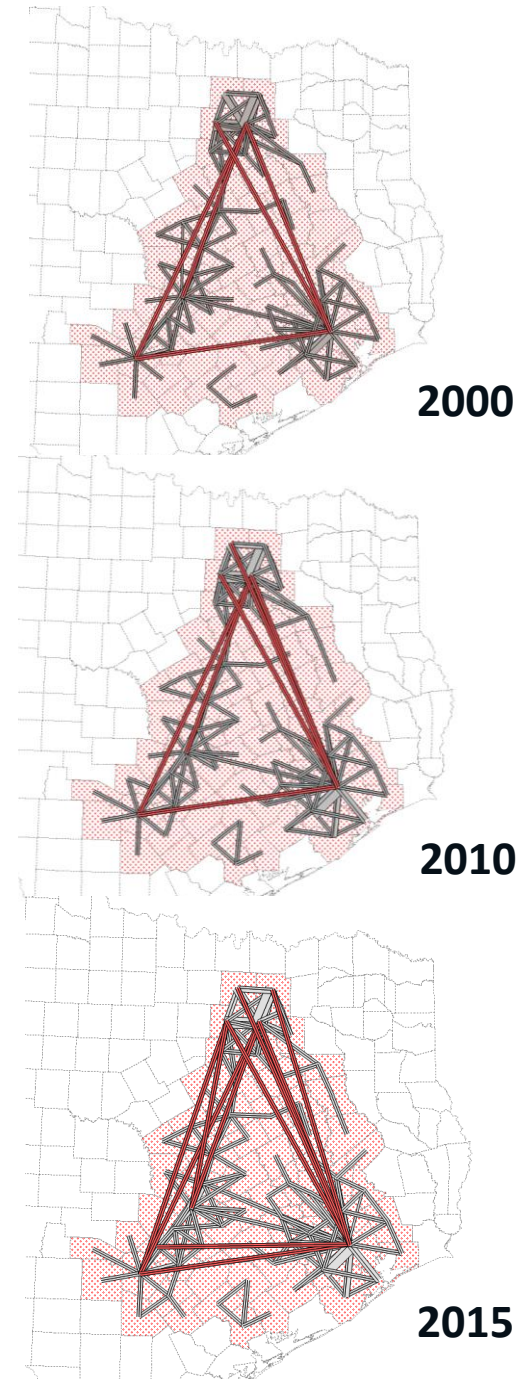
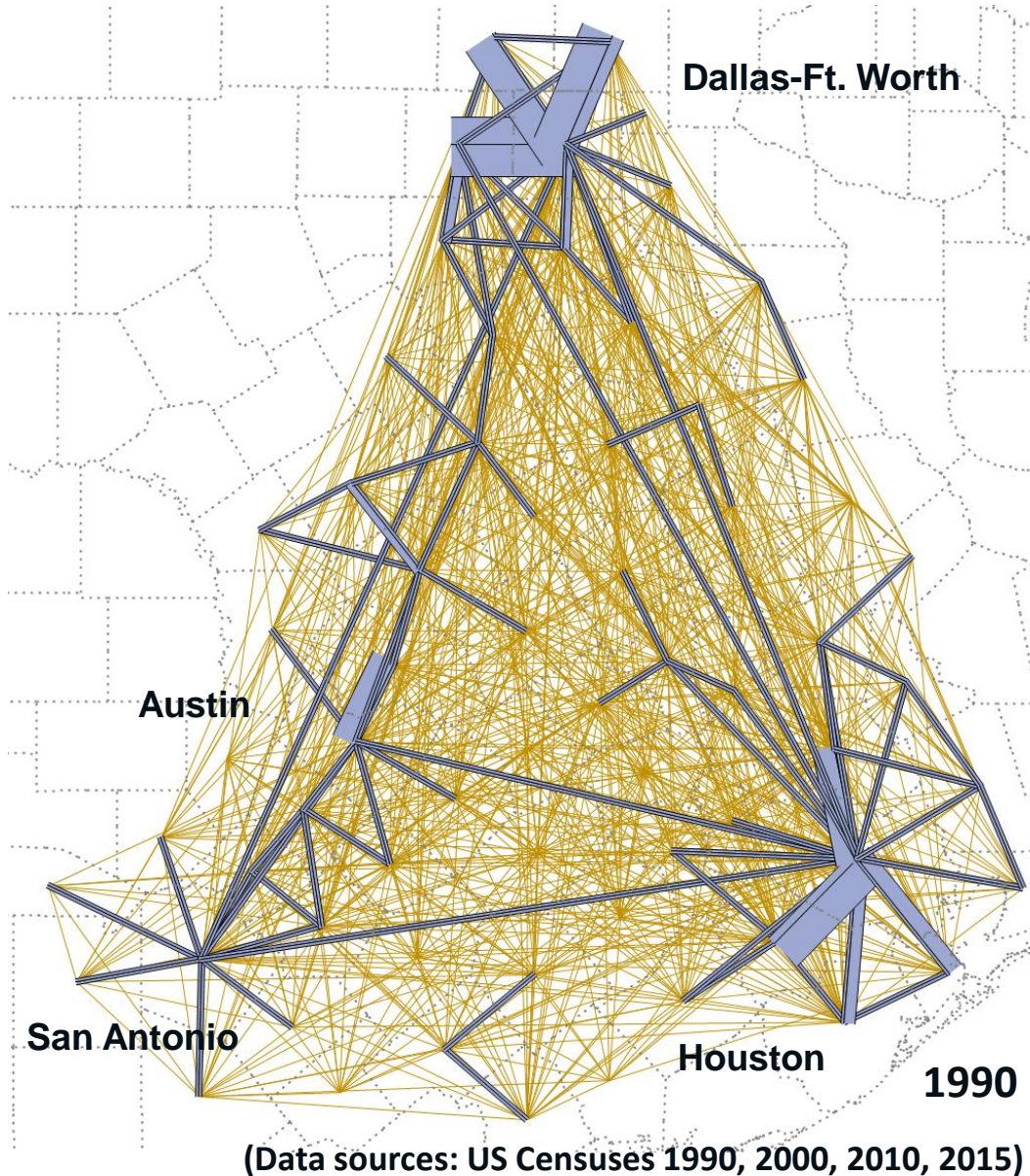


Air passenger flows



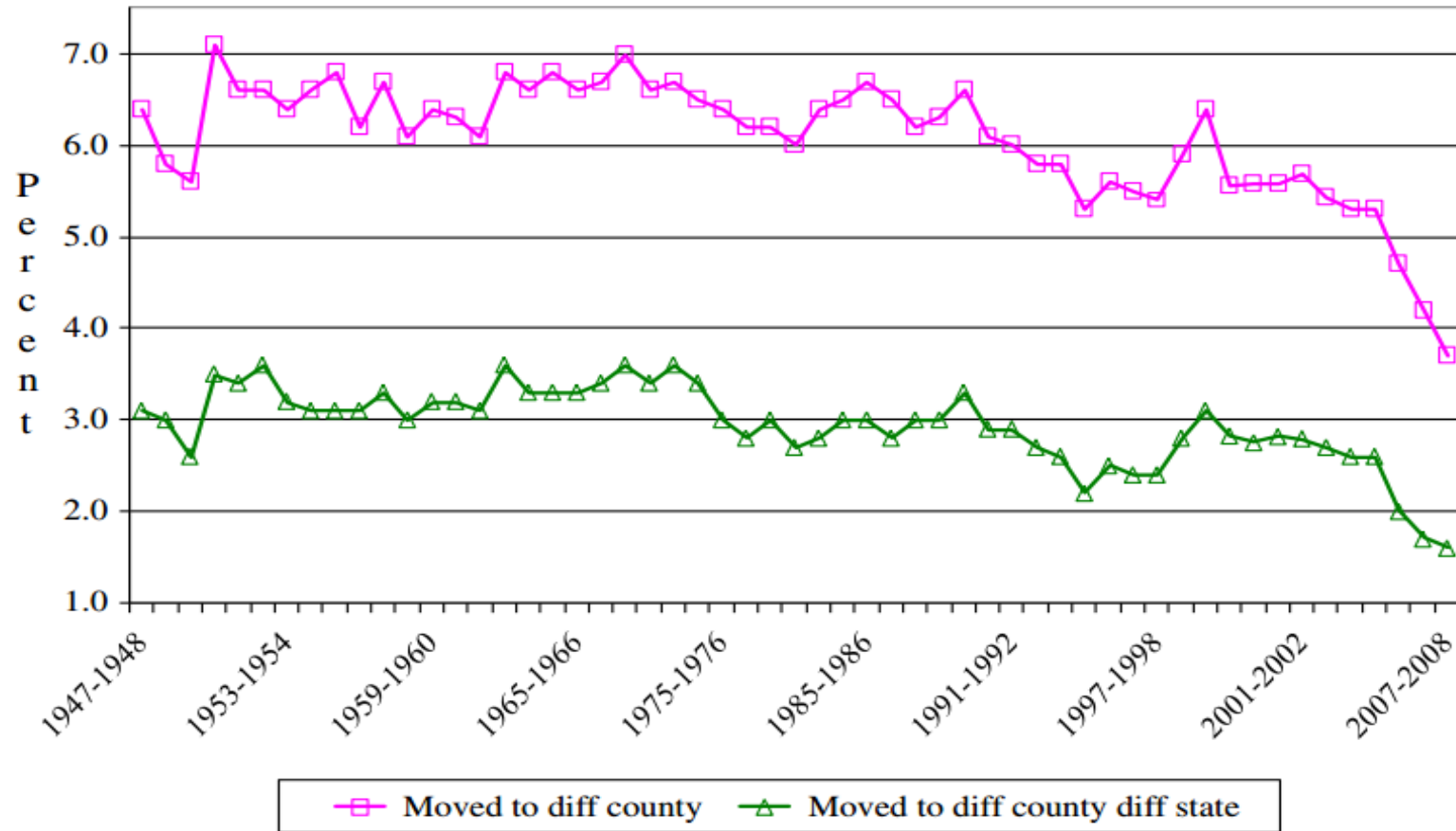
Super-Commute in the Texas Triangle

(50+miles or 90+ minutes one-way)



3. Territorial re-sorting

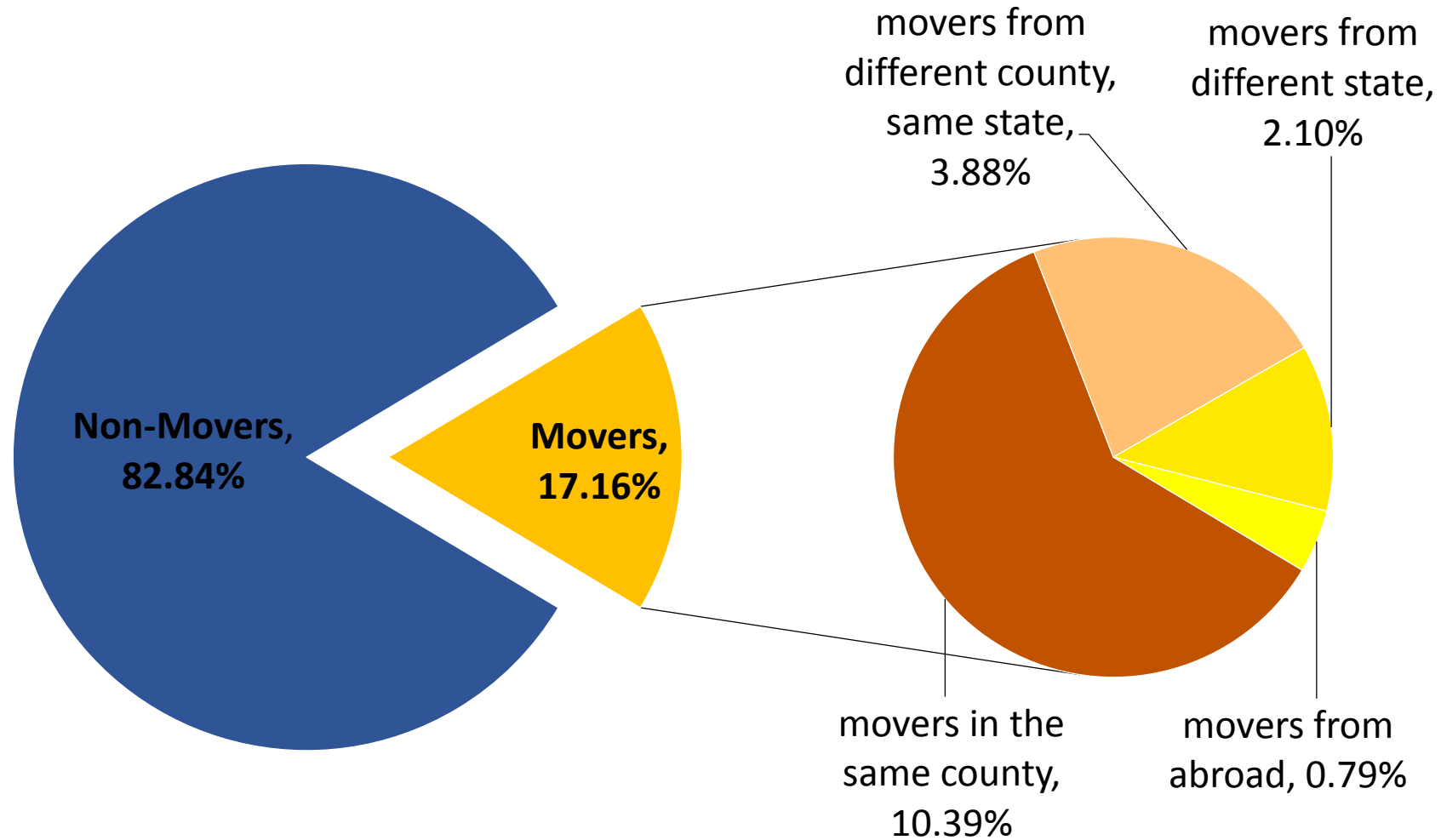
Migration pattern as an indicator of spatial re-sorting



US migration trends (Partridge et al.,2012)

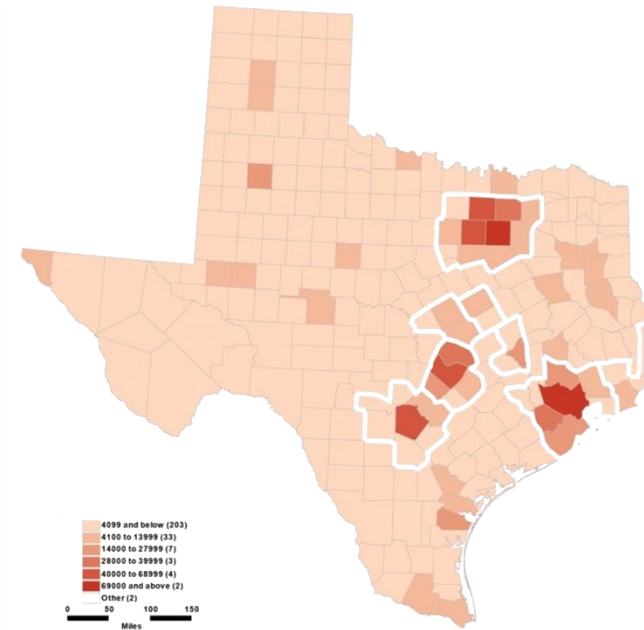
- Declining intra-state and inter-state migration since 1970s
- Entering an era of ‘new localism’ and increased rootedness (Kotkin 2009, Cooke 2011)

Migration patterns in Texas 2011-15

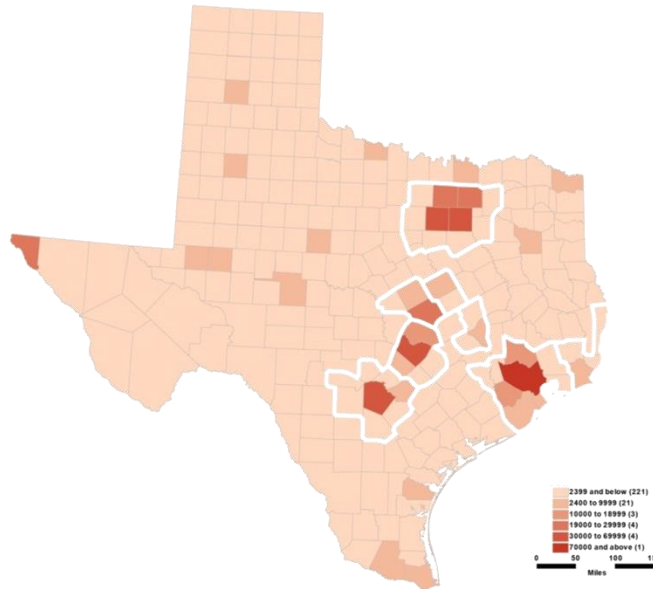


Migration spatial patterns in Texas 2011-15

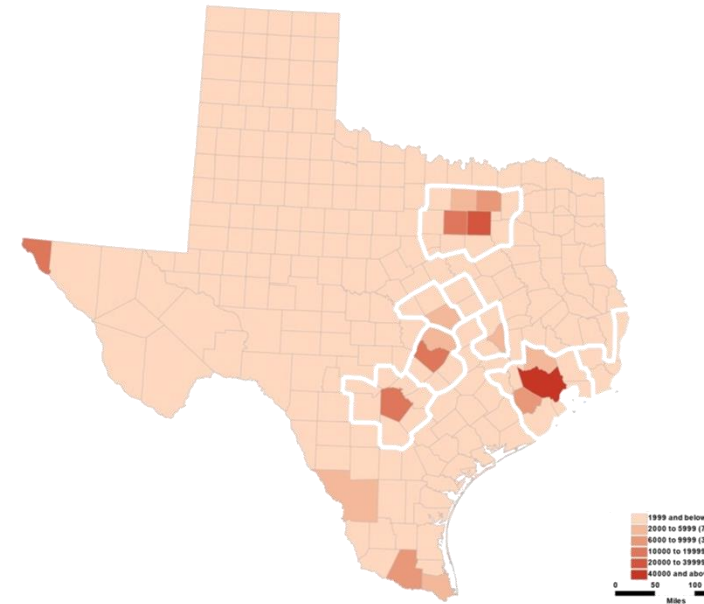
Mostly migrants moved into, out
of, or around within the core
counties of metros in the Triangle



Number of movers from different county, same state



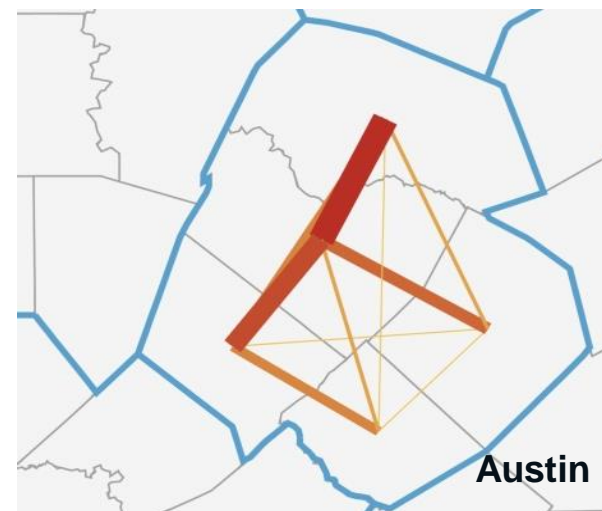
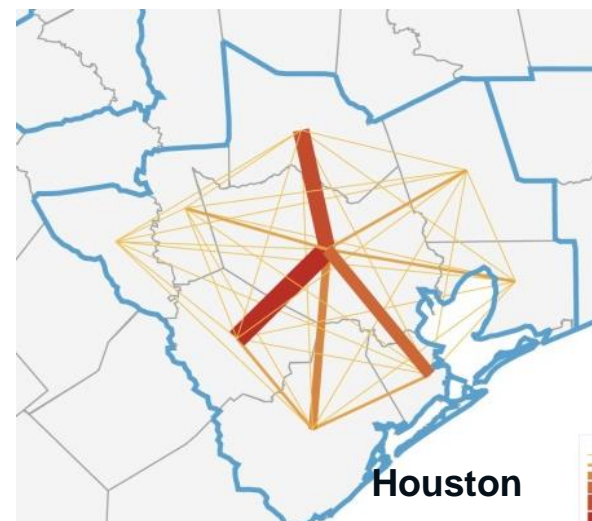
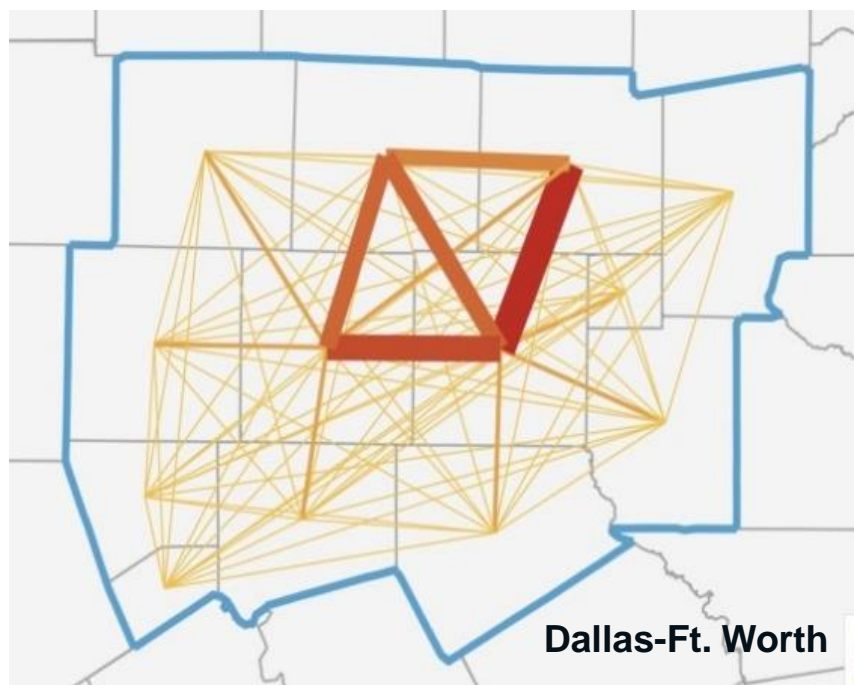
Number of movers from different state



Number of movers from abroad

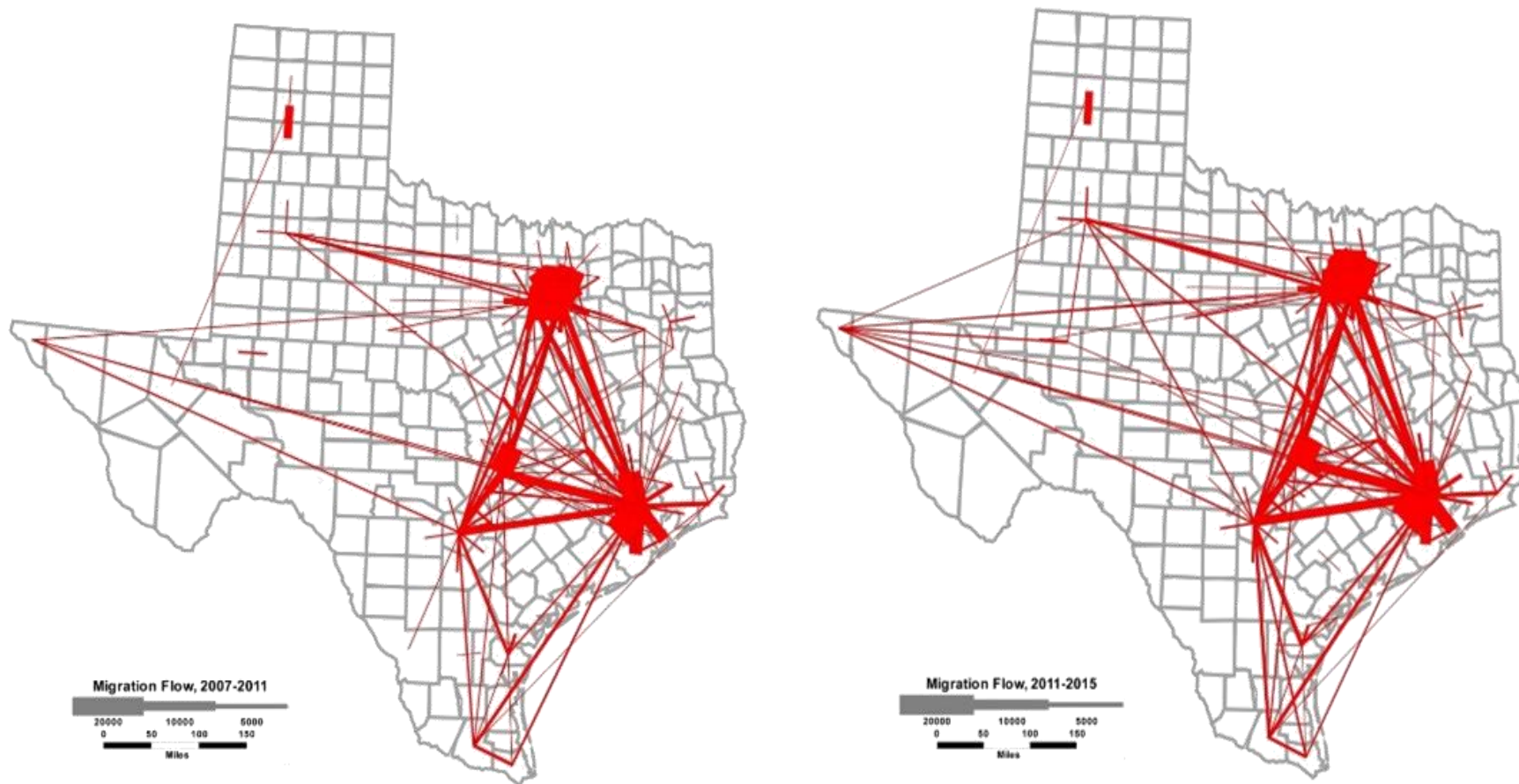
Migration spatial patterns in Texas 2011-15

Intra-MSA county-to-county migration patterns



Migration spatial patterns in Texas

There seems to be a strong Triangle adherence suggested by the migration pattern



County-to-county migration flow patterns: 2007-2011 (left); 2011-2015 (right)

4. Competitive co-producing

Location Quotient Analysis of Local Specialization

4 Metros in Texas Triangle **2004** (highlighted: industries serving mostly non-local markets)

Industries	Austin	Dallas Fort-Worth	Houston	San Antonio	# of Metros Having the Industry as Part of their Economic Bases
Communications	1.17	1.82		1.96	3
Holding and other investment offices		1.16	2.10	1.72	3
Oil and gas extraction		4.82	13.81	1.30	3
Transportation services		2.12	3.32	2.85	3
Electric, gas and sanitary services			3.69	3.13	2
Electronic and other electrical equipment	3.32	2.47			2
Heavy construction			3.03	1.18	2
Industrial machinery and equipment	3.69		1.26		2
Insurance		1.16		2.35	2
Miscellaneous repair services		1.37	1.58		2
Real estate		1.54	1.27		2
Transportation by air		2.49	1.40		2
Wholesale trade	2.08	1.47			2
Auto dealers and service stations				1.28	1
Chemicals and allied products			2.43		1
Depository and nondepository institutions		1.16			1
Eating and drinking places				1.35	1
Engineering and management services			1.40		1
Federal civilian				1.84	1
General building contractors				1.16	1
General merchandise stores				1.19	1
Home furniture and furnishings stores		1.38			1
Legal services			1.34		1
Military				4.70	1
Miscellaneous manufacturing				1.18	1
Petroleum and coal products			4.97		1
Pipelines, except natural gas			6.78		1
State government	2.27				1
Trucking and warehousing		1.17			1
Water transportation			3.38		1

Source: Adopted from Gilmer 2004a, 2004b and authors' calculation

Location Quotient Analysis of Local Specialization

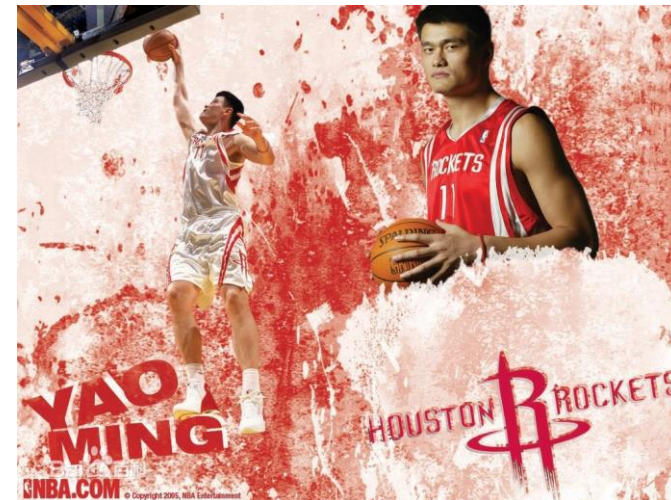
4 Metros in Texas Triangle **2016** (highlighted: industries serving mostly non-local markets)

Industries	Austin	Dallas Fort-Worth	Houston	San Antonio	# of Metros Having the Industry as Part of their Economic Bases
Real estate	1.36	1.28	1.16	1.06	4
Heavy construction	1.88	1.21	3.17	4.08	4
Eating and drinking places	1.31	1.06	1.10	1.29	4
Auto dealers and service stations	1.03	1.10	1.03	1.22	4
Communications	1.09	1.67		1.07	3
Insurance	1.01	1.12		1.63	3
Home furniture and furnishings stores	1.18	1.16	1.06		3
Oil and gas extraction		2.51	8.09		2
Transportation services		1.49	1.24		2
Holding and other investment offices		1.19		1.85	2
Electronic and other electrical equipment	2.13	1.76			2
Wholesale trade		1.17	1.21		2
Transportation by air		3.42	2.05		2
Miscellaneous repair services	1.17			1.09	2
Trucking and warehousing		1.58		1.25	2
Depository and nondepository institutions		1.69		1.60	2
Engineering and management services	1.69		2.46		2
Legal services	1.22		1.06		2
General building contractors	1.05		1.15		2
Industrial machinery and equipment	3.33				1
Electric, gas and sanitary services			1.58		1
Pipelines, except natural gas			7.47		1
Petroleum and coal products			4.47		1
Water transportation			3.32		1
Chemicals and allied products			2.12		1
General merchandise stores				1.05	1
State government					0
Military					0
Federal civilian					0
Miscellaneous manufacturing					0

5. Identity forming

The Texas Triangle Identity?

- “The Texas Triangle”, one section of Missouri Pacific (MoPac)’s premier name services, “Sunshine Special” in 1936, from St. Louis and Memphis to link Dallas, Fort Worth, Houston, Austin, and San Antonio.
- “Texas Triangle” now probably better known as the tough road trip facing NBA teams against the Dallas *Mavericks*, the Houston *Rockets*, and the San Antonio *Spurs*.
- The culture identity of Texas Triangle megaregion remains to be built.



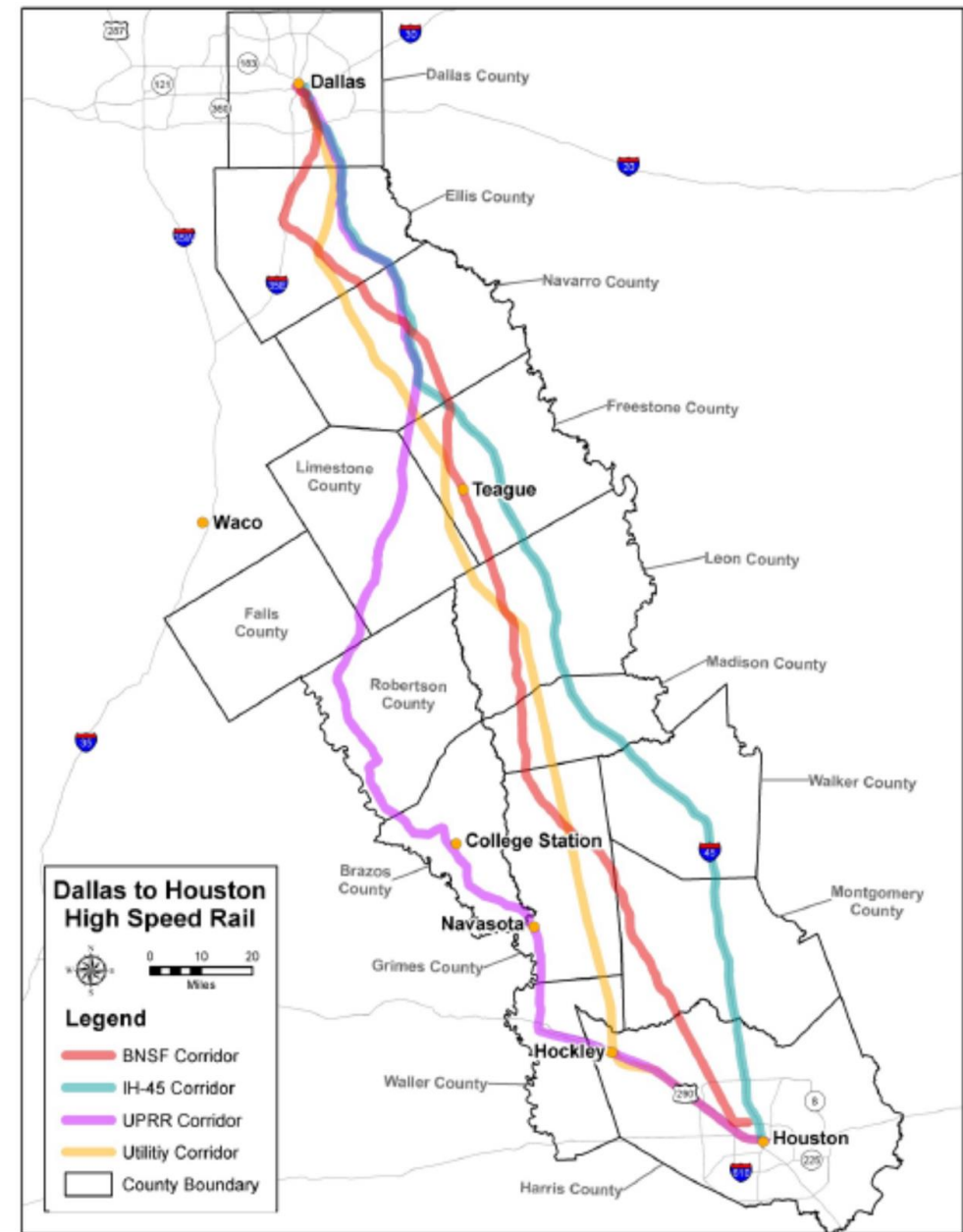
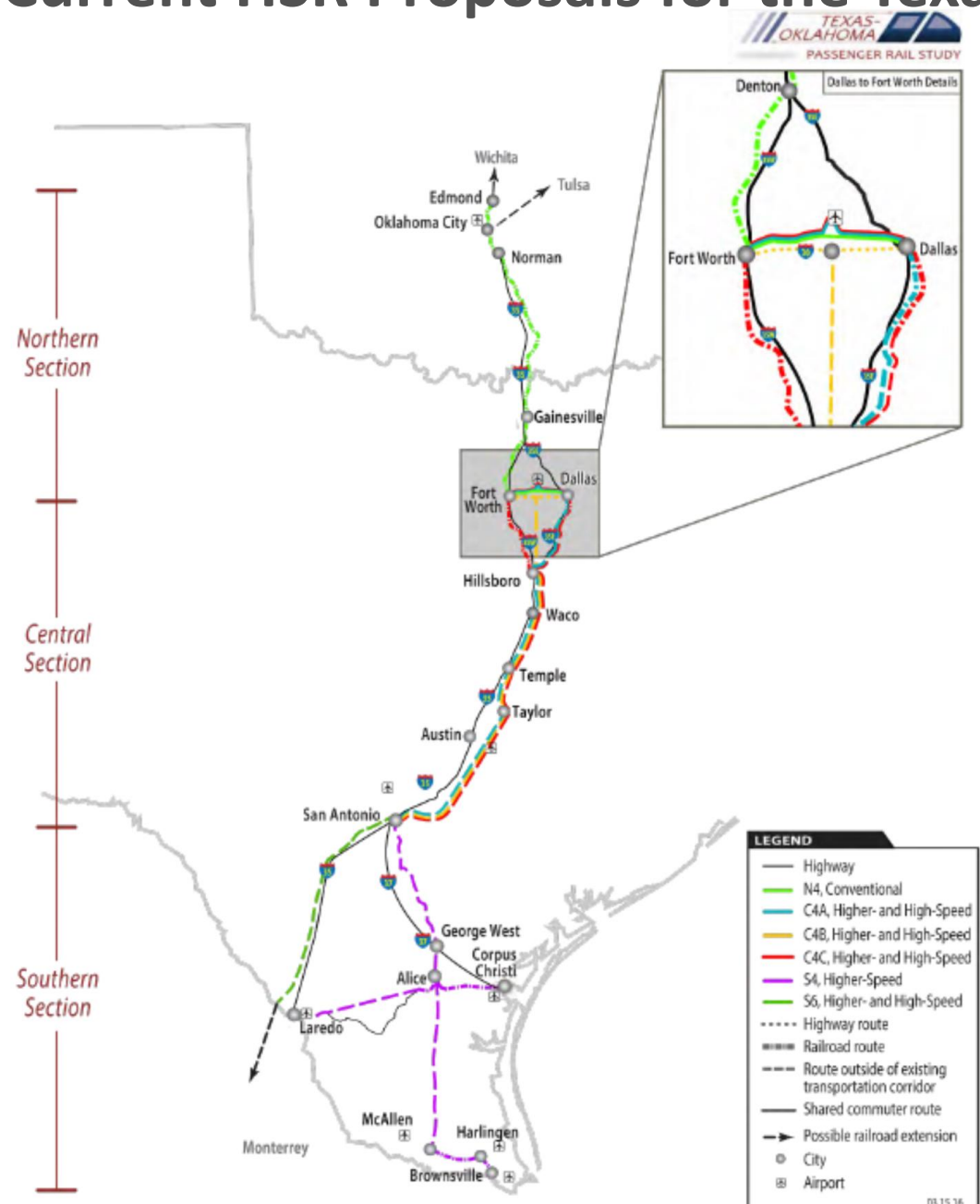
Implications when treating the Triangle as one integrated megaregion

- **Functions and services:** Expanded access and choices to employment, housing, and services at the megaregion scale
- **Behavioral:** Inter-metro travel → Intra-megaregion travel; daily travel decision frame → weekly travel decision
- **Spatial (in)equality trend,** increasing or decreasing along with the megaregional process?
- **Infrastructure investment:** Growth of demand for large volume, high-speed, and better services
- **Institutional:** Role of Metropolitan Planning Organizations (MPO)

Concluding Remarks

- **Megaregion/Super-City Region/City-Cluster agglomeration, a shared phenomenon in the global urbanization trend**
- **These agglomerations develop at different stages, reflecting both the status and the process**
- **Countries are taking different approaches to embrace the process, making sense to their respective economic and institutional settings**
- **Thank ahead: strategic transportation infrastructure investments**

Current HSR Proposals for the Texas Triangle



Source: AECOM, 2016

Call for Paper for the Special issue: Megaregional Approaches to Address the Mega-Challenges of Transportation and Environment

Call for papers for a virtual special issue at Transportation Research Part D on the Topic:

“Megaregional Approaches to Address the Mega-Challenges of Transportation and Environment”

Megaregion (also termed “mega-city region”, “super-city region”, or “city-cluster region” in the European and Asian context) refers to a large agglomeration consisting of two or more networked metropolitan areas and their hinterlands. French geographer Gottman first observed in the early 1960s the agglomerating phenomenon of *megalopolis* from Boston to Washington, D.C. and in other multi-metropolitan corridors of the United States. At the turn of this century, the agglomeration pattern re-emerged in the spotlight after a group of U.S. planners



UK2070

PENNDDESIGN – 2018-2019

UT Austin SOA -2018-19

PROGRAMME OF ACTIVITIES

UK CHARRETTE MANCHESTER

February 9th – 17th 2019

Led by

PennDesign: Dean Fritz Steiner & Professor of Practice Bob Yaro

UT Austin: Professor Ming Zhang & Research Scientist Ms. Lisa Luftus Otway

Venue for Sessions

Turner & Townsend

6th Floor 55 Spring Gardens

Manchester, M2 2BY

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Acknowledgement

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