Applied Demography: Some Texas Examples

Texas State University
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Round Rock, TX

OFFICE OF
THE STATE
DEMOGRAPHER

Demography – the study of the size, distribution, and composition of populations; the processes determining these – namely, fertility, mortality, and migration; and the determinants and consequences of all of the above.

~ Bogue, 1968; Murdock & Ellis, 1991

Mission

The Office of the State Demographer disseminates demographic and related socioeconomic data to the State of Texas and the general public. The State Demographer's Office monitors demographic and socioeconomic changes in the State in order to better inform the executive and legislative branches of Texas government. Special emphasis is placed on data that may be useful to policy makers in dealing with issues regarding the demand for state services.

Meeting the Mission

- Population Estimates and Projections Program
  http://txsdc.utsa.edu/Data/TPEPP/Estimates/Index.aspx

- Resource Witness at Legislative Hearings

- Public Presentations

- Data Portal, Publications, and Reports
  http://txsdc.utsa.edu/

- Data Requests

- Custom Research Projects

Some Applied Demography Questions

- How many people lived in Texas in 2010? How does this compare to past population counts?

- What percentage of the people living in Texas in 2010 were Hispanic?

- Where are the largest concentrations of people located in the State of Texas?

- How many children does the average Texas woman have?

- How many people live in Texas in 2011?

- How many people can we expect to live in Texas in 2050?

More Common Applied Demography Questions

- Are there urbanized areas in Texas that have limited access to public transportation? Where are these areas and who resides in these areas?

- How many individuals are currently eligible for adult basic education and how many will need adult basic education in the future? Where can we find these individuals?

- What demographic, socioeconomic, geospatial, and housing unit characteristics are related to household energy consumption? How do we use information about these relationships to target households and promote energy conservation?

Identifying geographic areas, and the characteristics of people within these areas, that are lacking public transportation
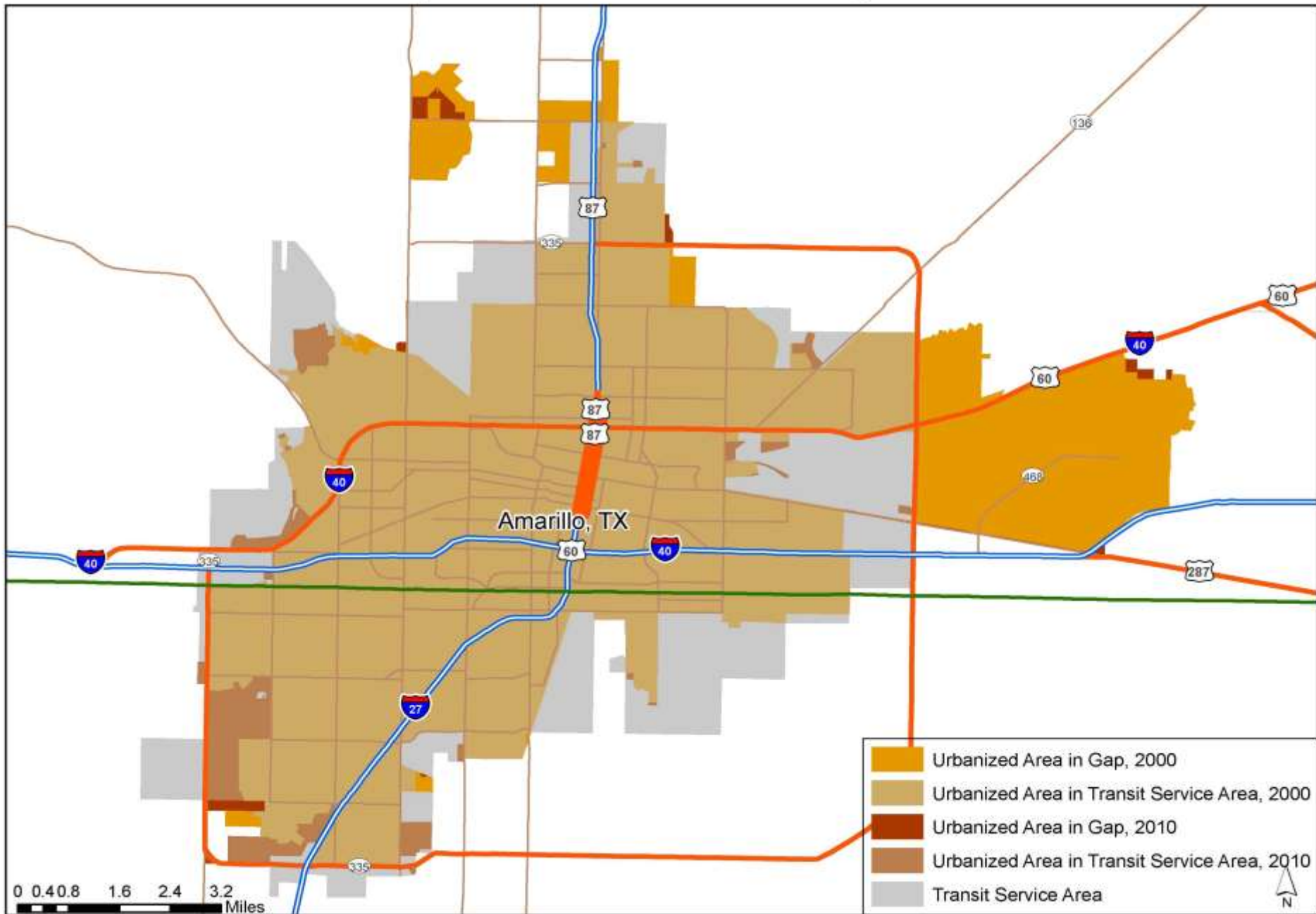
Key Objective:

- Quantify the size and composition of "urban gaps" in 2000 and 2010

- Used geographic and demographic output from a previous study for 2010 urbanized areas

Identifying Urban Gaps

- Began with two sets of maps
  - 2000 urbanized areas
  - 2010 urbanized areas
- Overlayed transit service area boundaries unto each urbanized area
- Urbanized areas outside of transit service area boundaries identified urban gaps in service

Transit Service Gaps in Amarillo Urbanized Area, 2000 and 2010

Amarillo, TX

0 0.40.8   1.6   2.4   3.2
Miles

Legend:
- Urbanized Area in Gap, 2000
- Urbanized Area in Transit Service Area, 2000
- Urbanized Area in Gap, 2010
- Urbanized Area in Transit Service Area, 2010
- Transit Service Area

Identifying Urban Gaps

Urban gaps were identified in the following urbanized areas:

- Amarillo
- Austin
- Beaumont
- College Station – Bryan
- Corpus Christi
- Dallas – Fort Worth – Arlington
- Denton – Lewisville
- El Paso
- Galveston
- Houston
- Killeen
- Longview

- Lubbock
- Midland
- Odessa
- Port Arthur
- San Antonio
- Temple
- Texarkana
- Tyler
- Victoria
- Waco
- Wichita Falls

Characteristics of People in Urban Gaps

- Transit Needs Index Variables of Interest:
  - Households without automobiles
  - Percentage of seniors
  - Percentage of persons with disabilities
  - Households in poverty
- Indicators estimated using 2000 Census Summary File 3 aggregate tables at the block group level.

Characteristics of People in Urban Gaps

- Households without vehicles
- Percent seniors

- Percent persons with disabilities

- Household income

- SF-3 Table P30: Means of Transportation to work
- SF-3 Table P11: Household type, including living alone, by relationship for the population 65 years plus
- SF-3 P42: Sex by age by disability status by employment status for civilian non-institutionalized population 5 years plus
- SF-3 P88: ratio of income in 1999 to poverty level 1.5 plus

Characteristics of People in Urban Gaps

- Block groups containing urban gaps were visually inspected using aerial photography to determine estimated proportion of total block group population contained within the gaps.

- Estimates were made using a 20% category scale, with possible estimates equal to 0%, 20%, 40%, 60%, 80%, and 100%.

- These rates were applied to total block group population 2000 and 2010 to obtain estimated urban gap population.

Aerial Image of Urban Gaps in Amarillo Urbanized Area, 2000

Urbanized Area in Gap, 2000

Urbanized Area Boundary
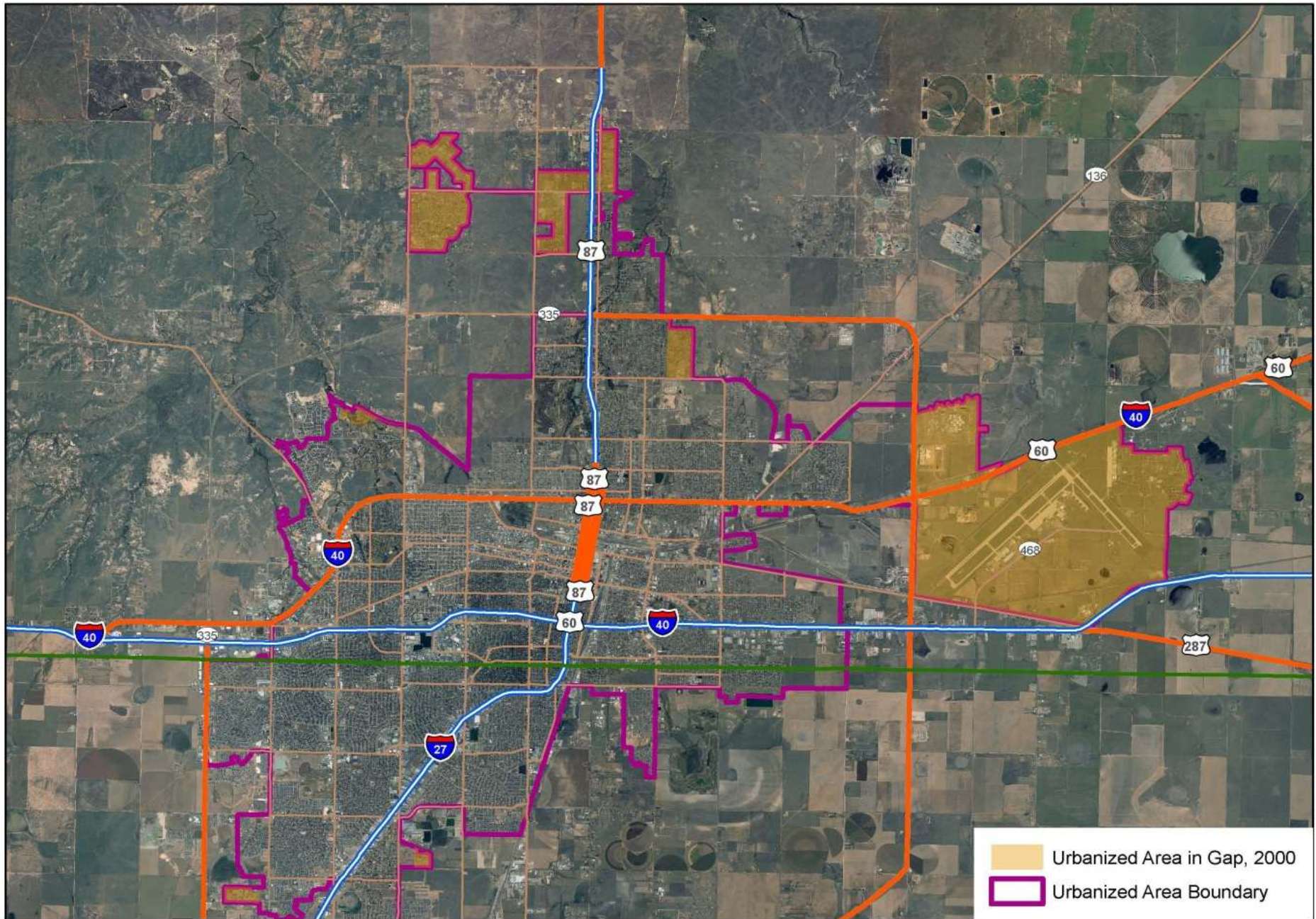
Characteristics of People in Urban Gaps

- Transit needs characteristic rates were calculated from 2000 Census population and SF-3 aggregate tables.

- Rates were applied to estimated urban gap population at block group level.

Projected Population in Urban Gaps

	UZAs, 2000	UZAs, 2010
Total Population	15,085,079	18,601,000
Urban Gap Population Estimate	2,942,783 (19.5%)	4,169,641 (22.4%)
Urban Gap Population 65 years plus	207,433 (1.4%)	273,419 (1.7%)
Urban Gap Workers 16 years plus with transit needs	211,534 (1.4%)	291,976 (1.6%)
Urban Gap Population 5 years plus with at least one disability	424,417 (2.8%)	569,567 (3.1%)
Urban Gap Population with known poverty status at 150% plus poverty level	460,997 (3.1%)	596,453 (3.2%)
	2000	**Projected 2010**
Texas Population	20,851,820	24,373,947

Estimating & projecting the need for
adult basic education

Estimating & Projecting
the Need for Adult Basic Education

- Client: Texas Workforce Investment Council

- Objective: to estimate and project the population in need of adult basic education services by age, sex, race, Hispanic ethnicity, and nativity at the state, local workforce development area level.

Estimating & Projecting
the Need for Adult Basic Education

Defining Adult Basic Education

- 1998 Workforce Investment Act, Title II, Section 203(1)
    - At least 16 years old, not enrolled in secondary school, and lack basic educational skills to function effectively in society, not have a secondary diploma or equivalent, or be unable to speak, read, or write English.

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Estimating & Projecting
the Need for Adult Basic Education

- NCES 2003 National Assessment of Adult Literacy
  - Below Basic, Basic, Intermediate, and Proficient Literacy
  - Document Basic Literacy – Find BMI given height, weight, and look-up table.
  - Quantitative Basic Literacy – Calculate price of sandwich & salad from menu.
  - Prose Basic Literacy – Find the name of someone who performed an action in a given narrative.

- NAAL 2003 confirmed a correlation between educational attainment and literacy.

Estimating & Projecting the Need for Adult Basic Education

Credential	Quantitative			Prose			Document		
	Below Basic	Basic	Int. +	Below Basic	Basic	Basic +	Below Basic	Basic	Int. +
< high school	64	25	11	50	33	17	45	29	27
GED	26	43	31	10	45	46	13	30	57
Diploma	24	42	34	13	39	48	13	29	57
Trade	18	41	41	10	36	49	9	26	66
Some Coll.	10	36	54	5	25	60	5	19	75
Assoc.	7	30	63	4	20	75	3	15	82
Bachelor's	4	22	74	3	14	84	2	11	87
Graduate	3	18	79	1	10	89	1	9	90

Source: NAAL 2003 Literacy in Everyday Life

Estimating & Projecting
the Need for Adult Basic Education

- American Community Survey 2006-2008
  - Age:
    - 16 to 64 years old (workforce ages),
    - 65 years plus.
  - School enrollment: not attended in last 3 months.
  - Educational attainment:
    - 1) Less than high school,
    - 2) High school and above,
    - Proportion for GED was extrapolated from ACS 1-YR 2008 and applied to ACS 3-YR estimate.
  - Ability to speak English:
    - 1) Not well & not at all,
    - 2) Well and very well.

Estimating & Projecting
the Need for Adult Basic Education

- Need for adult basic education services largely driven by immigration in Texas.

- Immigrants to Texas more often undocumented, non-English speaking, lower levels of education.

- Migration component of Texas State Data Center projections does not include international migration.

- Incorporated foreign, native born rates from ACS 3-YR estimates.

Estimating & Projecting
the Need for Adult Basic Education

- Cohort Component Method

- Adopted State Data Center's (SDC) current rates based on age, sex, race, and Hispanic ethnicity.

- Modified SDC's rates in order to separate the migration component into foreign born and native born.

- Applied fractions from Census Bureau estimates of net international domestic migration in 2000s (0.5, 0.6, 0.7).

Estimating & Projecting the Need for Adult Basic Education

- Used the 2006-2008 ACS to find the age, sex, race, and Hispanic ethnicity structure of foreign born.

- Used the 2008 ACS to get our base population.

- After reviewing trends, used a 60%-40% split foreign versus native born migration component.

- Assumed equal survival rates for foreign and native born and by definition, were able to ignore fertility rates for foreign born.

- Aged the population and calculated two migration scenarios: 0.5 and 2.0.

Estimating & Projecting the Need for Adult Basic Education

	Foreign Born			Native Born		
	Low Ed, Fluent	Low Ed, Not Fluent	High Ed, Not Fluent	Low Ed, Fluent	Low Ed, Not Fluent	High Ed, Not Fluent
ACS2008	496,643	1,106,745	418,206	1,666,345	115,109	51,822
2010	509,897	1,178,349	443,904	1,876,708	127,056	59,692
2015	573,346	1,333,482	484,964	2,108,779	155,098	69,791
2020	635,446	1,492,330	523,007	2,393,320	191,742	82,105
2030	753,493	1,826,164	591,667	3,043,037	287,652	111,286
2040	859,811	2,165,572	664,598	3,680,269	405,214	144,436

0.5 Migration Scenario

Estimating & Projecting
the Need for Adult Basic Education

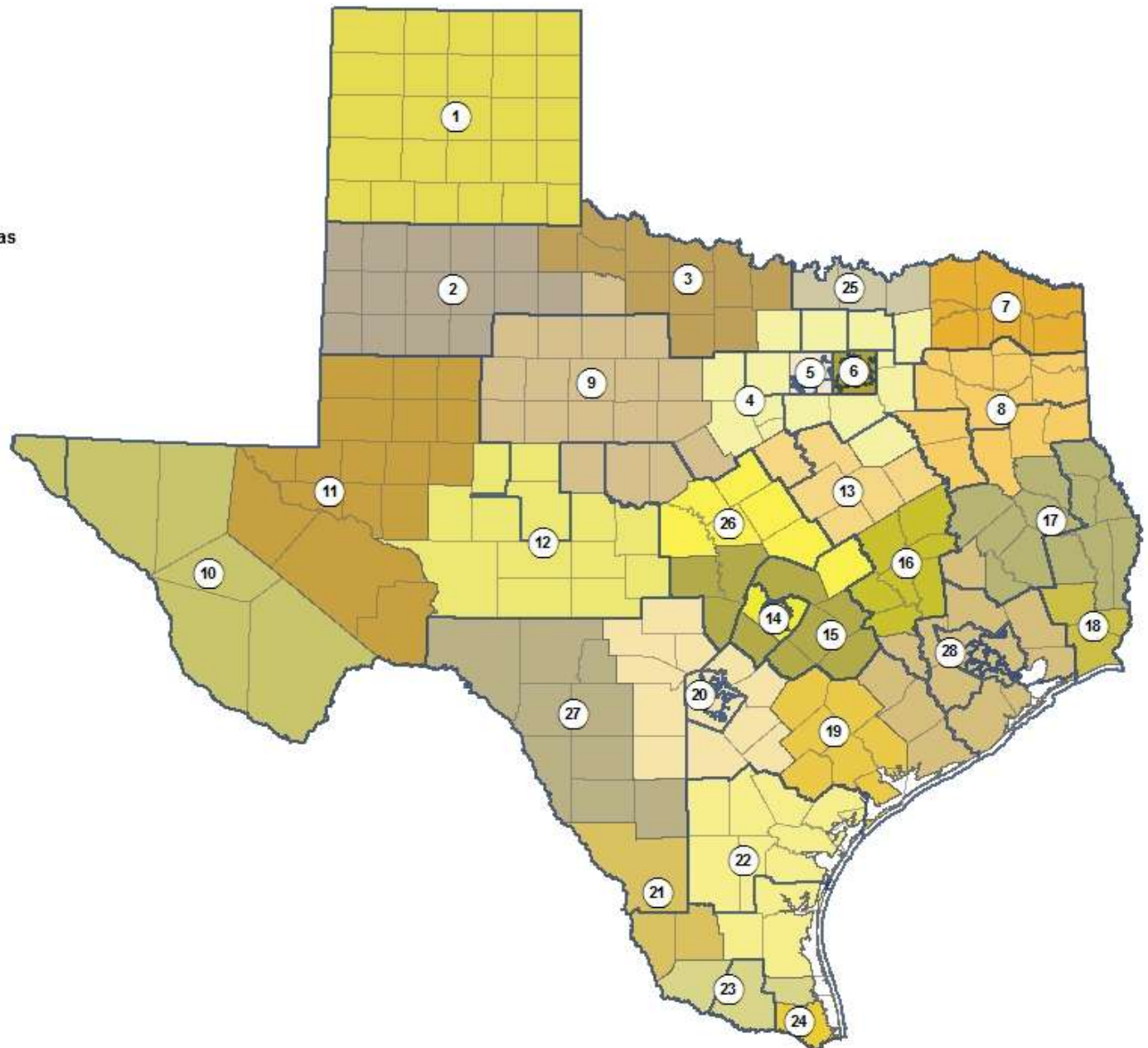|	Foreign Born			Native Born		
	Low Ed Fluent	Low Ed Not Fluent	High Ed Not Fluent	Low Ed Fluent	Low Ed Not Fluent	High Ed Not Fluent
ACS2008	496,643	1,106,745	418,206	1,666,345	115,109	51,822
PJ2008	484,998	1,118,971	426,095	1,773,940	118,480	54,603
2010	520,301	1,200,154	453,462	1,911,241	131,599	64,541
2015	616,348	1,423,822	524,001	2,179,198	163,726	77,766
2020	721,874	1,674,291	600,528	2,512,795	207,072	93,949
2030	966,003	2,276,556	777,663	3,337,276	331,254	135,160
2040	1,260,359	3,023,997	1,005,710	4,261,991	509,204	185,632

2.0 Migration Scenario

Texas Local Workforce Development Areas & ACS PUMAs

Legend

- County
- ACS PUMA

Local Workforce Development Areas

- 01. PANHANDLE
- 02. SOUTH PLAINS
- 03. NORTH TEXAS
- 04. NORTH CENTRAL
- 05. TARRANT COUNTY
- 06. DALLAS
- 07. NORTH EAST
- 08. EAST TEXAS
- 09. WEST CENTRAL
- 10. UPPER RIO GRANDE
- 11. PERMIAN BASIN
- 12. CONCHO VALLEY
- 13. HEART OF TEXAS
- 14. CAPITAL AREA
- 15. RURAL CAPITAL
- 16. BRAZOS VALLEY
- 17. DEEP EAST TEXAS
- 18. SOUTH EAST TEXAS
- 19. GOLDEN CRESCENT
- 20. ALAMO
- 21. SOUTH TEXAS
- 22. COASTAL BEND
- 23. LOWER RIO GRANDE VALLEY
- 24. CAMERON COUNTY
- 25. TEXOMA
- 26. CENTRAL TEXAS
- 27. MIDDLE RIO GRANDE
- 28. GULF COAST

Map created by the Office of the State Demographer at the University of Texas at San Antonio

Identifying demographic, socioeconomic, geospatial, and housing unit characteristics that are related to household energy consumption

How to Start

- Conducted literature review
- Identified and acquired data sources
- Outlined analysis plan
- Addressing challenges with data
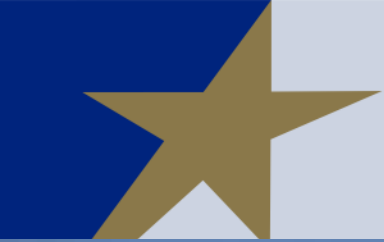
Demographics & Destiny

Hans Rosling's The Joy of Stats BBC Four

http://youtu.be/jbkSRLYSojo

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