Applied Demography: Some Texas Examples
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
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
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.
• 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

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

<table>
<thead>
<tr>
<th>Credential</th>
<th>Quantitative</th>
<th>Prose</th>
<th>Document</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Below Basic</td>
<td>Basic</td>
<td>Int. +</td>
</tr>
<tr>
<td>&lt; high school</td>
<td>64</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>GED</td>
<td>26</td>
<td>43</td>
<td>31</td>
</tr>
<tr>
<td>Diploma</td>
<td>24</td>
<td>42</td>
<td>34</td>
</tr>
<tr>
<td>Trade</td>
<td>18</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>Some Coll.</td>
<td>10</td>
<td>36</td>
<td>54</td>
</tr>
<tr>
<td>Assoc.</td>
<td>7</td>
<td>30</td>
<td>63</td>
</tr>
<tr>
<td>Bachelor's</td>
<td>4</td>
<td>22</td>
<td>74</td>
</tr>
<tr>
<td>Graduate</td>
<td>3</td>
<td>18</td>
<td>79</td>
</tr>
</tbody>
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Source: NAAL 2003 Literacy in Everyday Life
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.
• 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.
• 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).
• 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

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

0.5 Migration Scenario
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</tr>
<tr>
<td>ACS2008</td>
<td>496,643</td>
<td>1,106,745</td>
</tr>
<tr>
<td>PJ2008</td>
<td>484,998</td>
<td>1,118,971</td>
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<tr>
<td>2010</td>
<td>520,301</td>
<td>1,200,154</td>
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<tr>
<td>2015</td>
<td>616,348</td>
<td>1,423,822</td>
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<tr>
<td>2020</td>
<td>721,874</td>
<td>1,674,291</td>
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<tr>
<td>2030</td>
<td>966,003</td>
<td>2,276,556</td>
</tr>
<tr>
<td>2040</td>
<td>1,260,359</td>
<td>3,023,997</td>
</tr>
</tbody>
</table>

### 2.0 Migration Scenario
Identifying demographic, socioeconomic, geospacial, 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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