Texas Transit Needs Assessment and Performance Dashboard

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Part 1. Public Transit in Texas
Public Transit in Texas

Plays an important role

- Used for work, medical appointments, errands, etc.
- Over 289 million trips taken on Texas public transit services in FY2016.

Transit Authority and Municipal Transit Department

A Capital Metropolitan Transportation Authority
B Corpus Christi Regional Transportation Authority
C Dallas Area Rapid Transit
D Fort Worth Transportation Authority
E Denton County Transportation Authority
F City of El Paso Mass Transit Department
G Metropolitan Transit Authority of Harris County
H VIA Metropolitan Transit

This is the 1st subset of transit agencies in Texas.
Texas State-Funded Urban Systems

This is the 2nd subset of transit agencies in Texas.

Texas State-Funded Rural Transit Systems

This is the 3rd subset of transit agencies in Texas.
Part 2. Project Overview

Performance Dashboard

- Texas Transit Performance Dashboard is the continuing work of the transit district profiles released in early 2016.

- It is a website with interactive functions and designed to provides a one-stop information center on state-funded urban and rural public transportation providers in Texas.

- This project aims to enhance transparency in communicating Texas state-funded transit services and performances.
Building on Previous Work

2016
• Static profiles

2017
• Interactive website

Transit Needs Assessment

• Texas Transit Needs Assessment 2.0 is the continuing work of the Transit Service Needs Assessment in 2016.

• The previous assessment found that an estimated 35% of Texans do not have access to at least 12-hour weekday public transit service.

• Phase 2.0 of the project aims to further study the needs using a geospatial span analysis.
Building on Previous Work

2016
- Analyzed four types of need:
  - span of service,
  - urban and rural gaps,
  - inflation, and
  - population growth
- Span analysis did not account for actual transit service areas; assumed entire transit districts were covered.

2017
- Identify geographic coverage gaps using actual transit service areas
- Identify services where current span does not meet minimum thresholds
- Estimate inflation-adjusted costs for providing transit with common threshold for span to all Texans living outside transit authority boundaries

Data Sources

Main data sources used by both projects include the following:

Source 1
PTN-128 Data

Source 2
Texas Transit District Data Collection Survey
**Data Collection**

- General transit district service area boundaries, including areas served under interlocal agreements and contracts;
- Bus routes, including local bus, flex bus, regional bus, and commuter bus routes;
- Service areas of demand-responsive services, including services for the general public and for limited eligibility riders (such as seniors or people with disabilities); and
- Operating days and hours for each transit service mode.

**Data Mapping and Validation**

- TTI digitized all provided service areas and routes.
- Transit districts confirmed accuracy of maps, service areas, and span hours.
- All transit services input into a master service shapefile geodatabase.
Part 3. Dashboard Tour

Performance Dashboard Tour

https://www.texastransitdashboard.com/
Part 4. Needs Assessment Method

Steps

1. **Inventory Transit Service**
   Using data collected from the statewide survey, researchers inventory all transit services at state-funded transit districts.

2. **Gap Analysis**
   Find areas without transit service and areas without service operating at the span threshold.

3. **Cost Estimation**
   Estimate the costs of providing all Texans living outside of a transit-authority’s service area with a standard span of service.

4. **Transit Cost Inflation**
   Use NTD and PTN-128 data to project increases in average cost per revenue mile through FY2025.
Step 2 | Possible Types of Gaps

- Type A: No Transit Outside a Transit District
  - Urban gap
  - Transit authority gap (excluding donut holes)
  - County gap
- Type B: No Transit Inside a Transit District
- Type C: Service Span Below Threshold

Step 2 | Example Type A Gaps

Type A: No Transit Outside a Transit District
- Urban gap
- Transit authority gap (excluding donut holes)
- County gap
Step 2 | Example Type B Gap

Type B: No Transit Inside a Transit District

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Step 2 | Four Span Models for Type C Gaps

Type C: Service Span Below Threshold

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<tr>
<th>Model #</th>
<th>Title</th>
<th>Weekday Span Threshold</th>
<th>Saturday Span Threshold</th>
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<td>12-hour weekday, 8-hour Saturday service</td>
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<td>4</td>
<td>14-hour weekday, 8-hour Saturday service</td>
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Step 2 | Results: Type A and Type B

13,400 square miles
- Type A: 3,800 square miles
- Type B: 9,600 square miles

3.5 Million people
- Type A: 2.6 million
- Type B: 925 thousand

Step 2 | Results: Type C

Need between 417 and 1530 hours added per week.
Step 2 | Results: Type C for Demand Response

Assuming a 12-hour weekday, 8-hour Saturday span threshold

Step 2 | Results: Type C for Motor Bus

Assuming a 12-hour weekday, 8-hour Saturday span threshold
**Step 3 | Cost Estimation Procedure**

- Estimate FY2016 costs to fill Type A and B gaps with full span general-public demand-responsive service, including:
  - Operating costs based on regional conditions
  - Capital costs for vehicle purchases
- Estimate FY2016 costs to fill Type C (span) gaps using existing operating data.

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**Type A and B Gaps**

- Regional Conditions
  - Use average of adjacent transit district cost/population mile for GPDR.
- Number of Vehicles
  - # vehicles = 0.000017 * operating costs + 2.928
  - Baseline of 3 vehicles; Add a vehicle for each $58,441 increase in operating expenses.
### Step 4 | Transit Cost Inflation Indices

**Example: MB Transit Cost Inflation Index 2005-2025**

- Four indices:
  - Motorbus
  - Commuter bus
  - Demand response
  - Rural (PTN-128)

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<td>60.66</td>
<td>1.18</td>
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**Graph:**
- Motor Bus: 1.13
- Commuter Bus: 1.04
- Demand Response: 1.10
- Rural: 1.10
Cost-Benefit Analysis

Benefits of Meeting the Need:

• Transportation cost savings:  
  Cost savings realized by riders, reducing transportation costs  
  (e.g., vehicle ownership and operations costs)

• Low-cost mobility benefits:  
  Benefits realized by riders for new transit trips and presently  
  foregone trips due to transit gaps (i.e., latent demand)

• Economic multiplier for transit investments:  
  Value of the economic activity generated by investment of state  
  funds in public transit to close transit gaps

Cost-Benefit Analysis

Benefits Estimation Procedure:

• Transportation cost savings and low-cost mobility benefits  
  o Estimate new ridership and assign value to each new trip  
  o Ridership estimate based on current averages for each mode  
    of transit

• Economic multiplier  
  o "Every dollar spent on public transportation in Texas generates  
    $2.11 of economic activity" -- TxDOT RMC Report 0-6194

• Use pro-rated vehicle purchase costs for cost-benefit ratio  
  o Vehicles purchased to fill transit gaps have average expected  
    useful life of 6 years  
  o Pro-rate purchase cost using two years of six-year cost to  
    align with two-year operating cost and two-year benefits  
    estimate
Analysis Summary

- Statewide Inventory of transit service collected in geodatabase
  - Assisted researchers with both Transit Needs Assessment 2.0 and Transit Performance Dashboard.
- Gap Analysis
  - Took into account geographic coverage and service span.
- Transit Cost Inflation Indices
  - Utilized Operating cost per revenue mile, data from NTD and PTN-128.
- Cost Estimation
  - Used existing costs or regional peer transit district costs.
- Cost-Benefit Analysis
  - Performed cost-benefit analysis to emphasize importance of transit and addressing needs.

Thank you and Questions?

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