CENTER FOR TRANSPORTATION RESEARCH

PROJECT SUMMARY

Texas Department of Transportation

0-6768: Development of an Accessibility Formulation to Measure Customers' Evaluations of Demand Responsive Transit (DRT) Systems

Background

Demand-responsive transit (DRT) is a critical mode of transportation for many population segments in Texas. Texas has 39 rural transit providers and all of them contend with area-specific challenges in responding to their respective DRT markets. Ensuring that these markets have affordable and reliable transit services is an important objective for transit providers.

The research team worked on updating the DRT Accessibility Tool developed by the Texas Department of Transportation (TxDOT) Public Transportation Division (PTN) in Project 5-5178. The primary objectives of the research were to (1) classify the rural transit districts into five distinct categories, (2) update the Accessibility Tool to be customizable for each of the five categories, and (3) develop "what-if" scenarios for the Accessibility Tool to test.

What the Researchers Did

- The team performed a detailed analysis of DRT dimensions, services, and characteristics, developing five categories into which DRT agencies could be classified.
- Five agencies were selected as prototypical agencies to represent each category. Patronage data, vehicle fleet data, and other service area characteristics were then collected from each agency.
- Models of the DRT demand and patron scheduling were estimated for each of the five prototypical agencies selected. These models were then incorporated into the DRT Accessibility tool.
- The team set up the models so that accessibility is measured as the weighted sum of the relevant service characteristics. The weighting of the service characteristics was determined by the importance assigned to each characteristic by the actual DRT patrons of each prototypical agency, obtained via onboard surveys.
- A set of "what-if" scenarios was developed and used to test the tool. Tool users might use these scenarios to evaluate changes in the fleet characteristics, population demographics, and service area of their DRT system.
- A workshop with TxDOT personnel and rural transit providers was held to present the updated DRT Accessibility Tool in Microsoft Access.

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What They Found

Following are the important findings from the project.

- DRT agencies in Texas could be classified into five different categories, based on fleet and service area characteristics: 1) small areas, 2) medium areas, 3) large areas, 4) rural areas, and 5) non-Medicaid.
- The estimation of the behavioral models involved in the DRT context, specifically those associated with DRT demand and patron scheduling, produces different results for different categories.
- Patrons assign different levels of importance to the service characteristics involved in the accessibility measure, depending on which of the five different categories corresponds to their DRT provider.
- The accessibility measure can be used to predict and anticipate future needs of riders by using the tool to analyze the impact of changes in population demographics, fleet characteristics, and service area characteristics. These analyses aid DRT providers in pro-active planning and investment strategies.

What This Means

The DRT Accessibility Tool will allow rural transit districts to discover the current level of accessibility in their transit area, as well as forecast accessibility indexes for "what-if" scenarios. Being able to view the impact of these scenarios will benefit the transit districts in assessing possible transportation policies and allow the agencies to understand the accessibility issues from the patrons' perspective.

For More Information

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