Bus Network Study

Overview

A bus network study refers to the planning and implementation of significant changes to the network of bus routes, informed by an evaluation of the whole network structure rather than solely as a collection of routes. A full analysis and redesign of the bus network would align resources based on a thorough public process that accounts for community priorities that weigh the value of network coverage (as service may focus on main arterial roads), frequency, and walking distance to and from transit, origins, or destinations.

A focus on a high-frequency network based on transit propensity, origin/destination demand, and employment centers could increase ridership. Furthermore, it should be paired with strategically placed/equipped hubs and effective use of the fixed guideway networks. Another choice in network restructuring is a radial system-oriented system with its prime focus on the urban core (Downtown and Oakland) versus more crosstown routes allowing people to travel between city neighborhoods and suburban communities without having to go into Downtown Pittsburgh to transfer. Additionally, maintenance of direct services to the urban core from outlying areas, versus restructuring into a hub-based network would increase the amount of transferring needed to get to a destination but also increasing geographic coverage.

Needs must be balanced to address communities with high equity-based mobility needs and Title VI requirements. Title VI of the Civil Rights Act 1964 states that "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." For transportation this means:

- Ensure that the level and quality of public transportation service is provided in a nondiscriminatory manner
- Promote full and fair participation in public transportation decision-making without regard to race, color, or national origin
- Ensure meaningful access to transit-related programs and activities by persons with LEP (limited English proficiency)

The bus network study should measure and quantify anticipated and actual improvements from the redesign, which will help obtain support for the plan and with making decisions between different network scenarios. Metrics to consider include service area and coverage, impact on costs, equity implications, ridership, travel times, and transit accessibility. In many cases, the network redesign is used by transit agencies to redefine and better enforce their service standards and design guidelines, such as creating high-frequency routes (better than 15-20 minutes), and priority bus network (series of priority treatments such as limited stops, transit signal priority, queue jumps, and/or bus-only lanes).

Typically, network redesigns will be achieved in three phases:

Phase 1: Gather Information. During this initial phase, the transit agency (and usually a consultant) will conduct a market analysis; establish or revise bus route and network

service standards; and establish or revise budgetary, operator, and fleet resource limits. Stakeholder and public input is also critical during this phase. This can help gauge what the community desires and needs.

Phase 2: Analyze and Recommend. Once the initial data is gathered, the transit agency will collect and analyze route and network performance data; compare route and network performance against service standards, and make recommendations for service changes to improve adherence to service standards and stay within resource limits.

Phase 3: Engage the Public. Finally, the transit agency will need to hold public engagement targeted to riders of routes impacted by service change recommendations; revises recommendations based on public input; and implement final service changes.

Port Authority's Values
Efficient, Equitable, Accessible, Sustainable

Analysis
Transit agencies experience ancillary benefits from network redesigns. This includes the reduction of split shifts with more all-day frequency and improved communications between departments within the transit agency, along with overdue policy changes such as operations practice, organizational structure, fare policy, and rebranding.

Public engagement is key to successful network redesigns. Transit agencies need to convey the purpose of the network redesign to the public before, during, and immediately after the launch of the network redesign study. They need to educate the public, particularly targeted to riders of routes that will be impacted by service change recommendations, so that they understand the proposed changes and are not confused. Port Authority's previous network redesign was included in their 2007- 2010 Transit Development Plan. The first phase included approximately 50 Allegheny County bus routes being re-numbered, re-routed, or discontinued. The goal was to simplify their service, not reduce it, as they are still matching demand with service.

Peer Examples
Dallas Area Rapid Transit's 2016 *Bus Service Plan*

Halifax Transit's 2016 *Moving Forward Together Plan*

New York City MTA's 2017 *Staten Island Bus Study*

Level of Effort for Implementation:
Moderate

- Will require significant PAAC staff effort, along with cooperation and coordination with local stakeholders.

Resources
Transit Cooperative Research Program
Dallas Area Rapid Transit
Halifax Transit
New York City Transit Authority