Bus Network Study

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

Overview
A bus network study entails 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 access to and from transit, origins, and destinations.

A focus on a high-frequency network based on transit propensity, origin/destination demand, and employment centers could increase ridership and improve conditions for those with the longest, least-direct commutes by providing less waiting time. However, this must be evaluated in conjunction with fare policies, as providing free transfers or other affordable options makes this type of service change equitable. Furthermore, a network focused on high frequency must be paired with strategically placed/equipped transit centers and stops and effective use of the fixed guideway networks. Another choice in network restructuring is a radially-oriented system with a prime focus on the urban core (such as 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. This is generally the system which exists at the Authority now, and while it provides a robust system of both coverage and one-seat rides, it also puts pressure on the peak (rush hour) vehicle requirements of the agency and does not align as well with those commuting during non-peak hours, or those taking multiple transit routes already to reach their destinations. A network study should be very intentional with how services are provided to those who need them most, in alignment with the values in this long-range plan.

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. An example of this that many other systems have used is a summary statement comparing current population's access to X jobs within X minutes, versus a new or changed network's increased access to jobs or access to the same jobs but for more people in a similar amount of time. 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 minutes), and priority or rapid bus network (series of priority treatments such as limited stops, transit signal priority, queue jumps, and/or bus-only lanes).

Typically, network redesigns are conducted in three phases:

Phase 1: Gather Information and Determine Goals. During this initial phase, the transit agency (and usually a consultant) conducts a market analysis; establish or revises bus route

and network service standards; and establishes or revises budgetary, operator, and fleet resource limits. Stakeholder and public input is also critical during this phase to establish overall network goals (such as frequency versus coverage). This can help gauge what the community desires and needs and determine which types of network changes, if any, should be the focus of a redesign or tweaks to the network

Phase 2: Analyze and Recommend. Once the initial data is gathered and goals are set, 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.

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
- o 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

NEXTransit