Prioritizing Areas for King County Metro Transit's Feeder-to-Fixed Route Flexible Services

Thesis Project Summary

University of Washington College of Built Environments - Department of Urban Design and Planning & Evans School for Public Policy and Governance

Morgan Cowick and Daniel Munkel **|** July 2020

Introduction

This work identifies potential areas for prioritizing new feeder-to-fixed route flexible transit service in a way that aligns with King County Metro Transit's (Metro's) policy priorities. Flexible transit services are characterized by having some level of flexibility in routes, stops, or trip schedules. Feeder-to-fixed route transit is a flexible service model where riders can take an on-demand, dynamically-routed shared ride to or from a transit hub within a defined area. This type of service aims to close first-mile / last-mile gaps in transit connectivity, by bringing people directly into the fixed-route transit system. Examples of Metro's initial feeder-to-fixed route flexible pilot services include Via to Transit and Ride2.

One of Metro's newest guiding documents, the Mobility Framework Report, was released in October of 2019. This document was co-created by the community leaders of the King County Metro Mobility Equity Cabinet and charts a path for Metro to target new transit service to prioritize sustainability, equity, and serving areas with the greatest need. The Mobility Framework also includes a set of specific criteria for narrowing in on locations throughout the county with the greatest mobility needs that could be best served by flexible services. This work builds on these Mobility Framework criteria by pairing them with service-specific prioritization criteria for feeder-to-fixed route flexible services. This approach serves as a model for operationalizing the Mobility Framework recommendations for a specific flexible service type and lays the groundwork for applications to other services.

Analysis

This analysis combines the initial set of flexible service criteria from the Mobility Framework with a second set of criteria specific to feeder-to-fixed route flexible services. It evaluates a set of points with concentrations of public transit connections (Transit Connection Locations) and the 2-mile areas surrounding them— an approximation for feeder-to-fixed route flexible service area. The set of points was constructed from the components listed in Table 1.

Table 1: Transit Connection Locations Components

Inputs	Components
Puget Sound Regional Council (PSRC) Regional Growth Centers	18 Regional Growth Centers in King County
PSRC Regional Manufacturing/Industrial Centers	4 Manufacturing / Industrial Centers in King County
Metro Transit Activity Centers	64 Transit Activity Centers
Sound Transit Link Light Rail Stations through 2024	36 existing and planned light rail stations

Sources: (King County Metro, Metro Connects, 2015; PSRC, 2018; Sound Transit, 2020)

These areas were evaluated, filtered, and ranked based on Mobility Framework criteria that identify areas of greatest need, and according to service-specific feasibility filters:

Greatest Need Criteria
High Concentrations of Priority Populations, which include:
- Low- and no-income people
- People of color and indigenous people
- Immigrants and refugees
- People with disabilities
- Limited- English speaking communities

Low All-Day Transit Accessibility to:
- Jobs
- Community Assets, which include:
 - Schools, Medical Services, Social Services

Service Feasibility Filters
Feeder-to-Fixed Route Service-Specific Filters:
- Transit hub with a high number of daily transit trips (above 40th percentile)
- Low/medium population density (average population density of between 4 and 18 residents per acre)

The areas were scored by averaging the block group-level scores for Greatest Need and filtered according to the Service Feasibility Filters, as shown below.
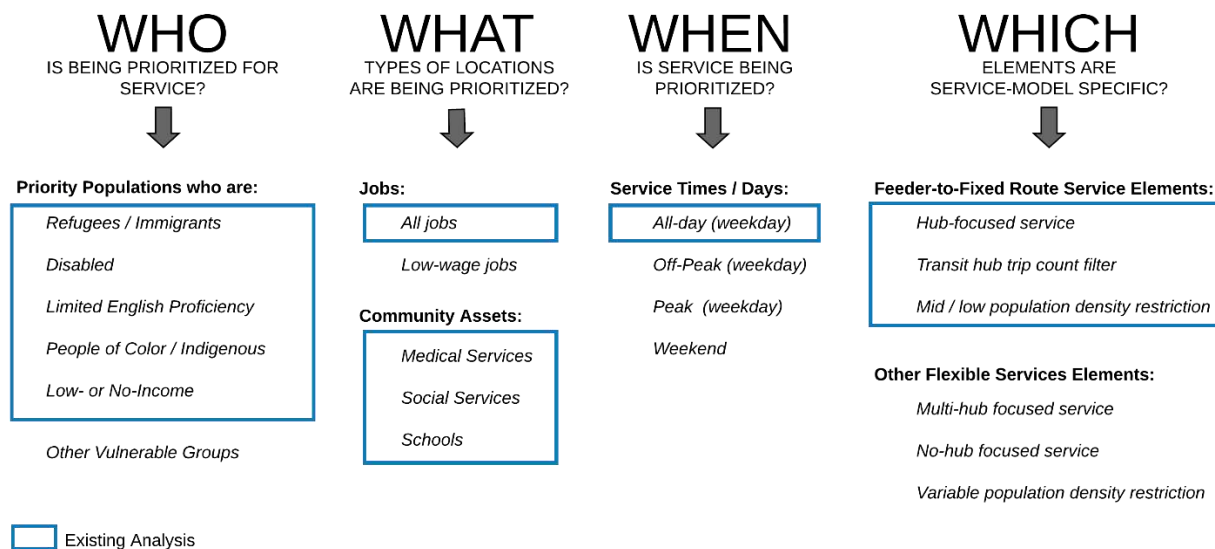
Figure 1: Analytical Process
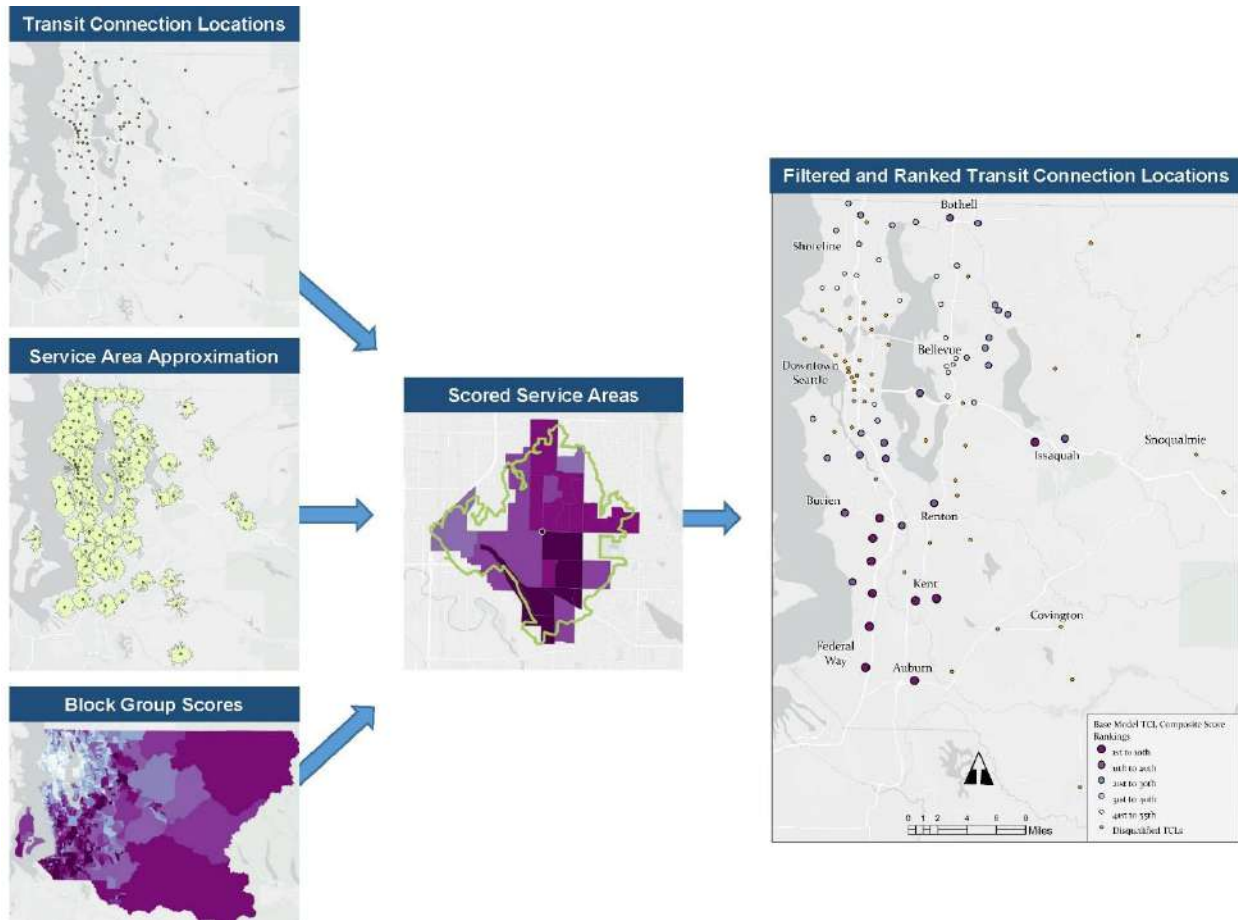
Results

This analysis produced ranked lists of areas that are good contenders for future feeder-to-fixed route flexible service given stated policy priorities. In general, the results point to a need for regional prioritization of these services in South King County. The rank order of top scoring locations varied slightly when each was evaluated for transit accessibility across specific times of day. Therefore, this analysis can also guide prioritization based on direction from the Mobility Framework to prioritize service during times of day when there is the most need for service.

Relevance

Beyond the specific application to feeder-to-fixed route flexible services, the broader value of this work is that it models a county-wide equity-focused prioritization analysis. Specifically, it models the selection of relevant inputs and methods, as well as the policy questions that inform them. The figure below lays out some of these underlying policy questions, and highlights the elements that were used for this analysis. This framework can be used to adapt the work for similar services by helping to link policy priorities to analytical inputs.

Figure 2: Relevant Policy Questions

WHO
IS BEING PRIORITIZED FOR SERVICE?

⬇

Priority Populations who are:

> *Refugees / Immigrants*
>
> *Disabled*
>
> *Limited English Proficiency*
>
> *People of Color / Indigenous*
>
> *Low- or No-Income*

Other Vulnerable Groups

WHAT
TYPES OF LOCATIONS ARE BEING PRIORITIZED?

⬇

Jobs:

> *All jobs*

Low-wage jobs

Community Assets:

> *Medical Services*
>
> *Social Services*
>
> *Schools*

WHEN
IS SERVICE BEING PRIORITIZED?

⬇

Service Times / Days:

> *All-day (weekday)*

Off-Peak (weekday)

Peak (weekday)

Weekend

WHICH
ELEMENTS ARE SERVICE-MODEL SPECIFIC?

⬇

Feeder-to-Fixed Route Service Elements:

> *Hub-focused service*
>
> *Transit hub trip count filter*
>
> *Mid / low population density restriction*

Other Flexible Services Elements:

Multi-hub focused service

No-hub focused service

Variable population density restriction

☐ Existing Analysis

Next Steps

This work presents an analytical approach that can be improved and adapted for other uses. Next steps are to streamline the process and then modify the criteria and methods for other flexible services and for other programs that aim to connect people to transit. In addition to extending the applications of the existing approach, this work should also be paired with a tool to gauge the benefit of adding a new flexible service like feeder-to-fixed route to test how the calculation of transit accessibility changes given the addition of a potential new service area.

It's important to note that this work assumes that flexible service planning will follow the process of fixed-route service planning. The idea is that the analysis can identify changes in accessibility to key locations as the fixed-route network changes and help address needs for service. However, in the long-term, the planning for fixed-route service should be done in tandem—and be shaped by—the planning for flexible transit services.

In summary, this work quantifies the policy inputs from the community leaders of the Mobility Framework's Equity Cabinet, who in turn represent the interests of diverse community groups. The intent was to translate stated priorities into analytical criteria that could be modeled for a specific service type, as a step in deciding where to put future services. It is recommended that as a next step, the results produced through this work direct follow-up community engagement efforts that can gather community input on the need for service in identified priority areas.