Technical Memo 13: Optimized Scenario Ridership Documentation

Highway 169 Mobility Study

Report Version 1.0

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TOC Title: Table of Contents

Document4

Appendix A: Optimized Scenario Ridership Documentation

Transit ridership forecasts were developed for the Optimized Scenario BRT service along Highway 169 in the study area and into downtown Minneapolis on TH 55. Additional details of the BRT and associated service proposed as part of these alternatives are provided in the Detailed Definitions of Alternatives Technical Memorandum.

BRT Operations Assumptions

The BRT ridership forecast model uses several inputs from the alternatives service plan. All assumptions regarding the BRT service plan, run times, and connecting bus service are detailed in the BRT Transit Service Plan and Operations and Maintenance Costs Technical Memo. Key components guiding the transit ridership forecasts include the following:

Assumed BRT Service Frequency

The BRT operating plan assumes one route pattern that stops at all stations. Proposed frequencies are 15 minutes in the peak periods, and 30 minutes in the late evening and weekend early morning and evening periods. A span of 18 hours from 5:00 am to 11:00 pm is proposed seven days a week. Proposed frequencies and span of service meet specifications in Metropolitan Council's Regional Transitway Guidelines.

Assumed BRT run times

BRT acceleration and deceleration rates, dwell times, traffic signal delays, and peak-period and off-peak speed were used to develop BRT run times in both peak and off-peak periods. Run times range from as long as 1 hour 39 minutes northbound in the morning peak to 1 hour 18 minutes southbound during off-peak times.

Assumed route and service changes or additions to connecting bus service

Several changes were recommended to background bus service to improve connections at proposed Highway 169 BRT stations. These include new routes, extensions or modifications to existing routes, or increased frequency of existing routes.

Transit Ridership Results

Transit ridership forecasts were developed using the Metropolitan Council's Regional Travel Demand Model, utilizing the same transportation network and land use assumptions as the highway traffic forecasts. The results of this analysis provide overall ridership for service along Highway 169, as well as several breakdown measures indicating different characteristics of the ridership.

Total bus rapid transit ridership is expressed through the station-to-station ridership totals for the Optimized Scenario. This captures average daily riders on this service along any portion of the route. The Optimized Scenario is estimated at 5,600.

Several subordinate ridership measures have also been prepared that help to understand the characteristics of the station-to-station BRT ridership. These include summaries or off-peak ridership, reverse-commute ridership, and transit-dependent ridership. It should be noted that these measures are not mutually exclusive, meaning that a single rider can qualify for more than one category, and are also not exhaustive, such that they some riders may not be in any categories and they do not sum to the BRT ridership totals.

Off-peak ridership provides an estimate of the portion of the BRT riders using the service outside of the morning and afternoon peak periods. Off-peak ridership is estimated at Reverse commute ridership measures the number of riders using the service in the opposite direction of express bus service, which in this case indicates rides from along the southbound service during the AM and northbound service in the PM hours of the day. This measure is not limited to peak or off-peak times of day. The Optimized Scenario has an estimated 3,200 reverse commute riders each day. Finally, transit dependent ridership reflects the number of riders originated from zero-car households, and again includes all times of day. The Optimized Scenario is estimated to have 2,300 transit-dependent riders.

Additional measures summarizing transit ridership forecasts for the Highway 169 corridors incorporate transit routes beyond the station-to-station BRT service. These are primarily focused on express buses and other routes operating along a portion of Highway 169 in the study area. The first measure is ridership benefitting from improved transit advantages provided along Highway 169 as part of the project alternatives including bus shoulders and MnPASS lanes. For the Optimized Scenario, it is estimated that this would affect 1,600 additional riders. These are added to the station-to-station BRT ridership totals in the table coming to a total of an estimated 7,200 riders along the guideway.

The second measure considers SouthWest Transit routes with the potential to shift to Highway 169 to take advantage of improved travel times resulting from the additional capacity of the project alternatives. These routes do not necessarily utilize Highway 169 under existing or no build conditions, but their routing could potentially be modified if additional bus shoulders or MnPASS lanes were present. An estimated 2,600 riders could benefit from these changes in the Optimized Scenario.

Table 1. Optimized Scenario Ridership by Measure

Measure	Ridership
Station-to-Station BRT	5,600
Transit-Dependent	2,300
Reverse Commute	3,200
Peak (Off-Peak)	2,800 (2,800)
Express Bus	1,600
Guideway Total	7,200
Express Bus Routes with Potential to Use Hwy 169	2,600
New Transit Riders	1,900