**Technical Memorandum #5**

**Ridership Evaluation**

This document briefly summarizes the methods used to develop the ridership forecasts of the transit service options developed for the Red Rock Corridor Alternatives Analysis Update.

October 24, 2013

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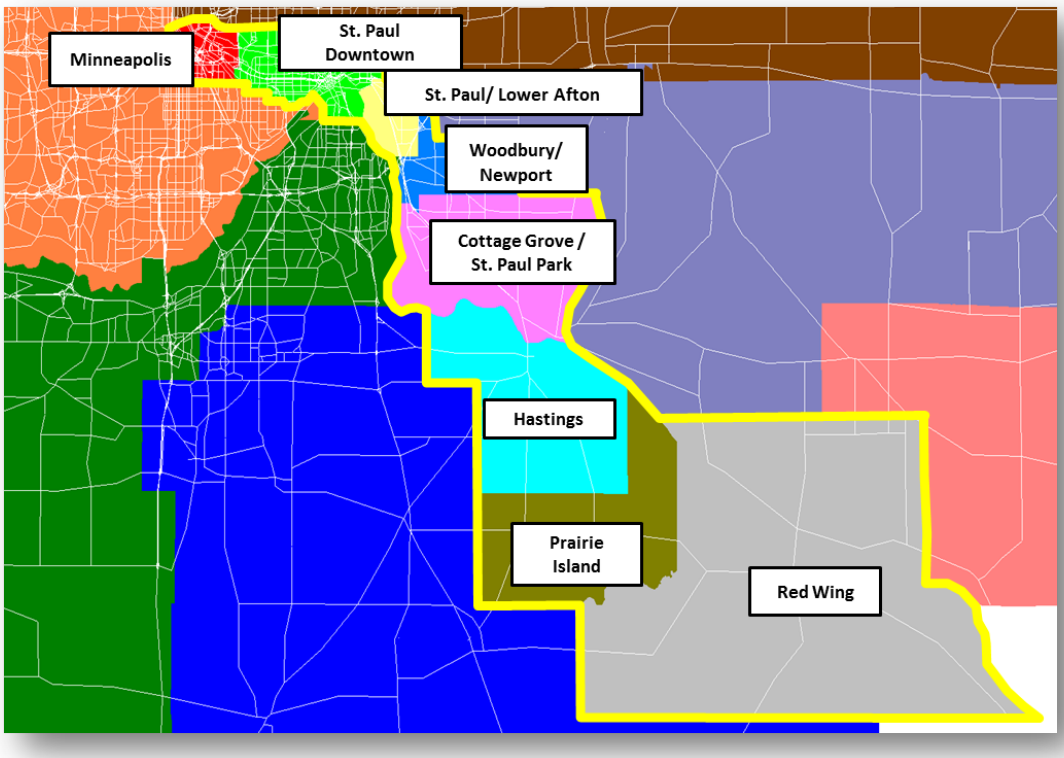
## 1. INTRODUCTION

This memo describes the methods used to develop the 2030 ridership forecasts for transit service options for the Red Rock Corridor Alternatives Analysis Update. An automated method of ridership calculation, using the Twin City Regional Travel Demand Model, was used to develop forecasts for an initial set of transit service scenarios, and a manual method of ridership calculation was used to develop forecasts for the options carried forward in the AAU. A manual method was used to develop ridership estimates of the service options carried forward because by that time, the modeling phase of the project had been completed and it was felt that the information gathered through that process was sufficient for manual ridership calculations. These forecasts were used at this stage of planning to compare the different transit service options. The discussion of the ridership forecasts of options carried forward begins in Chapter 5. A broader discussion of the modeling effort is provided earlier in the memo.

### A. MODEL CALIBRATION

The corridor calibration and the future year ridership estimates were performed using the Twin City Regional Travel Demand Model provided by the Metropolitan Council. The corridor calibration was focused primarily on the transit market within the study corridor, as shown in Figure 1.

**Figure 1 – Red Rock Study Corridor**



The study corridor was developed to mimic the 2007 Red Rock Corridor Alternatives Analysis with an extension southward to include Prairie Island and Red Wing, while honoring the regional model's Traffic Analysis Zones (TAZ) boundaries. For model calibration purposes, the study corridor was divided into eight districts / areas:

1. Red Wing
2. Prairie Island
3. Hastings
4. Cottage Grove / St. Paul Park
5. Woodbury / Newport
6. St. Paul / Lower Afton
7. St. Paul Downtown
8. Minneapolis CBD

The transit market along this corridor is primarily served by three express bus routes, Routes 361, 364, and 365, which only operate during peak periods. These three bus routes provide services for transit patrons from the first six districts listed above to downtown St. Paul and Minneapolis, and vice versa (note that transit patrons from the first three districts listed above must drive to the Cottage Grove Park and Ride to access the express bus services). These also provide local trips to some extent. Considering that downtown St. Paul and downtown Minneapolis are the two main destinations of the transit commuters, the transit markets for these two destinations were calibrated to replicate the surveyed data. The calibration effort was performed for the 2010 model year using the Twin Cities Regional Travel Demand Model, and the observed data was developed using several available survey datasets:

- 2010 Travel Behavior Inventory (Household Survey)
- 2010 Metro Transit On-Board Survey Data
- 2000 Census Journey to Work (JTW) data (2010 JTW data was not available at the time of the calibration), and
- 2010 traffic counts.

The comparisons of the observed and estimated key measures are also presented in this section.

## 2. CALIBRATION OF MODEL

The model was calibrated against observed conditions that exist in the St. Paul and Minneapolis areas in order to check that the model reflects current and future conditions.

### A. TRANSIT MARKET MOVEMENTS

Table 1 shows the comparison of the observed and estimated transit markets between the southern six districts and downtown St. Paul / Minneapolis for those commuters who boarded express bus routes 361, 364, and 365. This table does not include the local movements south of the St. Paul CBD and between downtown St. Paul and Minneapolis. The observed data were developed from the 2010 Metro Transit On-Board Survey provided by Metropolitan Council staff. The model estimated a slightly lower transit market than provided to Minneapolis and higher transit market than observed to St. Paul. The overall demand was under-predicted by approximately seven percent of the surveyed data.

**Table 1 – 2010 Observed and Estimated Transit Trips**

| Destination | Survey[(1)] | Model Estimates | Percent Difference |
|---|---|---|---|
| Minneapolis CBD | 500 | 430 | -14% |
| St. Paul CBD | 260 | 280 | 8% |
| **Total** | **760** | **710** | **-7%** |

***Notes:***
*Ridership reflected in the table has been rounded to the nearest 10*
*[(1)] Survey data was developed from the 2010 Transit On-Board Survey*

### B. RIDERSHIP BY ROUTE

The next comparison is the average weekday ridership for the three express bus routes that serve the study corridor. Table 2 shows the comparison of the 2010 observed and estimated ridership by bus route. The model under-predicted both Routes 361 and 365 and over-predicted Route 364. The percentage difference for each ridership estimate appears large due to the small transit market, especially for Route 364. However, the cumulative difference between the observed and modeled ridership for the three bus routes is approximately six percent below the observed value.

**Table 2 – 2010 Ridership Comparison by Route**

| Transit Route | Observed Ridership Data[(1)] | 2010 Model Estimated Ridership | Percent Difference |
|---|---|---|---|
| 361 | 280 | 240 | **-14%** |
| 364 | 40 | 90 | **125%** |
| 365 | 540 | 480 | **-11%** |
| **Total** | **860** | **810** | **-6%** |

***Note:***
*[(1)] From Sector 3 Ridership Data provided by Metro Transit*
*Ridership reflected in the table has been rounded to the nearest 10*

### C. TRAVEL TIME AND HEADWAYS COMPARISON

In addition to the ridership comparison, the modeled travel time and headways of each express bus route were compared with the bus schedule to ensure that the routes were modeled adequately in the calibration year. The comparison shown in Table 3 indicates that the modeled travel time for Routes 361 and 364 are slightly higher than the scheduled time, while Route 365 is slightly lower. However, they are all within reasonable tolerance.

**Table 3 – 2010 Travel Time and Headways Comparison**

| Route Name | Travel Time (mins.) | | Headways (mins.) | |
|---|---|---|---|---|
| | Schedule | Modeled | Schedule | Modeled |
| 361 | 33 | 34 | 45 | 45 |
| 364 | 41 | 48 | 60 | 60 |
| 365 | 46 | 41 | 20 | 20 |

## 3. MODELED SCENARIOS

There are six scenarios that were analyzed as part of the ridership forecasting effort, three of which were BRT variants. Those scenarios are:

1. *Enhanced No-Build Scenario*, in which the service frequencies for Routes 361 and 365 were increased, while service levels for Route 364 were maintained.

2. *Express Bus Scenario*, in which a new express bus route had all-day service and served the corridor between Red Wing and Minneapolis, although during the off-peak period the service coverage was limited to the corridor between Hastings and St. Paul.

3. *BRT Scenarios*, described as follows:
   a. The Partial Investment, in which only minor investments were made in the corridor and headways were 15 minutes throughout the day.
   b. Full Investment, in which major investments were made in the corridor to enhance travel time and headways were 15 minutes throughout the day.
   c. Full Investment, in which major investments were made in the corridor to enhance travel time and headways were 15 minutes in the peak periods but only 30 minutes in the off-peak periods.

All BRT scenarios provide service between Hastings and Union Depot only.

4. *Commuter Rail Scenario*, in which commuter rail operated during the peak periods, while demand during the off-peak period was provided by supplemental bus service. As part of this alternative, a modified Route 364 operated between Cottage Grove and Newport Stations during the peak

periods as a feeder bus to the commuter rail stations and to serve the local transit market.

For the future year transit alternatives, the transit running times and headways for model year 2030 are summarized below in Table 4. The running time and headways for the peak period shown in this table are those of the peak direction. Note again that these do not reflect the options that were carried forward in the analysis. Also note that these correspond to inputs into the ridership model, which do not necessarily correspond to the headways and travel times one would see in a schedule, in part because they are values of the services spread over a longer peak period.

**Table 4 – Travel Time and Headways for each Transit Scenario**

## Travel Time

| Transit Route | Origin-Destination | Enhanced No-Build | | Express Bus | | BRT Partial | | BRT Full-1[1] | | BRT Full-2[2] | | Commuter Rail | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak |
| 361 | Cottage Grove - St. Paul | 43 | *No Service* | *N/A* | | *N/A* | | *N/A* | | *N/A* | | *N/A* | |
| 364 | Cottage Grove - St. Paul | 53 | | | | | | | | | | | |
| 365 | Cottage Grove - Minneapolis | 51 | | | | | | | | | | | |
| New Express Route | Red Wing - Minneapolis | *N/A* | | 107 | *No Service* | | | | | | | | |
| | Hastings - St. Paul | | | 44 | 44 | | | | | | | | |
| | Hastings - Minneapolis | | | 62 | 68 | | | | | | | | |
| BRT | Hastings - St. Paul | | | *N/A* | | 42 | 42 | 39 | 39 | 39 | 39 | | |
| Commuter Rail | Red Wing - Minneapolis | | | | | *N/A* | | *N/A* | | *N/A* | | 86 | *No Service* |
| Supplemental Bus | Hastings - St. Paul | | | | | | | | | | | *No Service* | 42 |

## Headways

| Transit Route | Origin-Destination | Enhanced No-Build | | Express Bus | | BRT Partial | | BRT Full-1[1] | | BRT Full-2[2] | | Commuter Rail | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak | Peak | Off-Peak |
| 361 | Cottage Grove - St. Paul | 26 | *No Service* | *N/A* | | *N/A* | | *N/A* | | *N/A* | | *N/A* | |
| 364 | Cottage Grove - St. Paul | 60 | | | | | | | | | | | |
| 365 | Cottage Grove - Minneapolis | 13 | | | | | | | | | | | |
| New Express Route | Red Wing - Minneapolis | *N/A* | | 20 | *No Service* | | | | | | | | |
| | Hastings - St. Paul | | | 90 | 40 | | | | | | | | |
| | Hastings - Minneapolis | | | *No Service* | 30 | | | | | | | | |
| BRT | Hastings - St. Paul | | | *N/A* | | 15 | 15 | 15 | 15 | 15 | 30 | | |
| Commuter Rail | Red Wing - Minneapolis | | | | | *N/A* | | *N/A* | | *N/A* | | 45 | *No Service* |
| Supplemental Bus | Hastings - St. Paul | | | | | | | | | | | *No Service* | 30 |

***Note:***

[1] *BRT Full Investment with 15-minute off-peak headway*

[2] *BRT Full Investment with 30-minute off-peak headway*

The modeled highway travel time during the peak period for the peak direction of travel was also compared for selected origin-destination pairs to gauge the increase of congestion level in the future. Table 5 shows the travel time for these selected segments in 2010 and 2030. The future travel time for those segments is generally about 10 minutes higher than the 2010 travel time.

**Table 5 – Modeled Highway Travel Time on the Peak Period Direction**

| Route | Travel Time (mins.) | |
|---|---|---|
| | 2010 | 2030 |
| Red Wing to St. Paul | 65 | 75 |
| Hastings to St. Paul | 39 | 49 |
| Cottage Grove to St. Paul | 25 | 34 |
| Red Wing to Minneapolis | 90 | 101 |
| Hastings to Minneapolis | 64 | 74 |
| Cottage Grove to Minneapolis | 50 | 60 |

## 4. 2030 TRANSIT RIDERSHIP ANALYSIS RESULTS DIRECTLY FROM MODEL

The 2030 estimated total ridership for each modeled scenario is shown in Table 6. The average weekday boarding summary by station for each alternative is presented in the following subsections. Note that these are not the options carried forward in the study; they were a set of scenarios developed at the mid-point of the study for discussion. For the most part, they were scenarios that incorporated generous features (i.e., all-day service, more stations) so that if the decision was made to cut back on the services, corresponding boardings could be removed. These forecasts were generated by an automated method that used the Regional Travel Demand Model.

### Table 6 – Total Ridership by Transit Route for Each Modeled Scenario

| Transit Route | No-Build | | | Express Bus | | | BRT Partial Investment | | | BRT Full Investment - 1[(1)] | | | BRT Full Investment - 2[(2)] | | | Commuter Rail | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Peak | Off-Peak | Total | Peak | Off-Peak | Total | Peak | Off-Peak | Total | Peak | Off-Peak | Total | Peak | Off-Peak | Total | Peak | Off-Peak | Total |
| 361 | 592 | *No service* | 592 | N/A | | | N/A | | | N/A | | | N/A | | | N/A | | |
| 364 | 116 | | 116 | | | | | | | | | | | | | | | |
| 365 | 600 | | 600 | | | | | | | | | | | | | | | |
| New Express Route | N/A | | | 1,156 | 656 | 1,812 | | | | | | | | | | | | |
| BRT | | | | N/A | | | 1,178 | 872 | 2,050 | 1,258 | 924 | 2,182 | 1,258 | 516 | 1,774 | | | |
| Commuter Rail | | | | | | | N/A | | | N/A | | | N/A | | | 1,636 | *No Service* | 1,636 |
| Supplemental Bus | | | | | | | | | | | | | | | | *No Service* | 502 | 502 |
| **Total** | **1,308** | | **1,308** | **1,156** | **656** | **1,812** | **1,178** | **872** | **2,050** | **1,258** | **924** | **2,182** | **1,258** | **516** | **1,774** | **1,636** | **502** | **2,138** |

***NOTE:***

*[(1)] 15 minute Headways Throughout the Day*

*[(2)] 30 minute Off-Peak Headways*

### A. ENHANCED NO-BUILD MODELED SCENARIO

The enhanced no-build scenario retained the existing express bus routes, Routes 361, 364, and 365, and increased the frequencies of Routes 361 and 365. In this scenario, there was no transit service in the study corridor during the off-peak period. Table 7 shows the average weekday boarding summary for the three express bus routes. The transit market from the east side of Cottage Grove (Ivystone Ave / Indian Blvd) for Route 361 seemed to be higher than expected. Currently, the transit market from this area is quite low. This probable overestimation is due to the limited ability of the Regional Model to handle the modeled wait time for transit users.

**Table 7 – Average Weekday Boarding Summary for the 2030 No-Build Scenario**

| Route 361 Station / PNR Location | Total Boardings |
|---|---|
| Ivystone Ave / Indian Blvd | 117 |
| Cottage Grove PNR | 131 |
| HWY 61 and Lower Afton Rd | 51 |
| 5th St and Minnesota St, St. Paul | 177 |
| 5th St and 7th St, St. Paul | 116 |
| **Total** | **592** |

| Route 365 Station / PNR Location | Total Boardings |
|---|---|
| Cottage Grove PNR | 257 |
| HWY 61 and Lower Afton Rd | 43 |
| 6th St and Hennepin Ave, Minneapolis | 99 |
| Ramp B_5th Transit Center, Minneapolis | 201 |
| **Total** | **600** |

| Route 364 Station / PNR Location | Total Boarding |
|---|---|
| Hadley Ave and 80th St, Cottage Grove | 18 |
| Lincoln Ave and 85th St, Cottage Grove | 21 |
| 3rd st and Pullman Ave, Cottage Grove | 9 |
| 4th Ave and 4th St, Cottage Grove | 16 |
| Newport Transit Station | 7 |
| 5th St and Minnesota St, St. Paul | 34 |
| 5th St and 7th St, St. Paul | 11 |
| **Total** | **116** |

### B. EXPRESS BUS SCENARIO

The modeled express bus scenario operated in the peak and off-peak periods. There were three variations of the new express bus route:

1. Red Wing – Minneapolis Route: operated mainly in the peak periods.
2. Hastings – St. Paul Route: operated mainly in the peak periods.

3. Hastings – Minneapolis Route: operated in both peak and off-peak periods.

The existing express bus routes were discontinued in this modeled scenario.

The average weekday boarding summary by station is shown in Table 8.

**Table 8 – Average Weekday Boarding Summary for 2030 Express Bus Scenario**

| New Express Route Station / PNR Location | Total Boardings |
|---|---|
| Red Wing | 40 |
| Prairie Island | 4 |
| Hastings | 100 |
| Cottage Grove | 470 |
| Newport | 183 |
| Lower Afton | 174 |
| Union Depot | 511 |
| Minneapolis | 154 |
| Target Corner | 154 |
| 5th St Transit Center | 22 |
| **Total** | **1812** |

### C. BRT SCENARIOS

There were three BRT scenarios that were considered in the modeling efforts. All three BRT scenarios served the corridor between Hastings and Union Depot in St. Paul. The average weekday boarding summary for these scenarios is shown in Table 9. Note that the existing express bus routes, Route 361, 364, and 365, were not incorporated into these scenarios.

**Table 9 – Average Weekday Boarding Summary for 2030 BRT Scenarios**

| BRT Station / PNR Location | Total Boardings | | |
|---|---|---|---|
| | Partial Investment Option | Full Investment with 15-Minute Off-Peak Headways | Full Investment with 30-Minute Off-Peak Headways |
| Hastings | 162 | 171 | 152 |
| Cottage Grove | 264 | 281 | 241 |
| Newport | 485 | 527 | 421 |
| Lower Afton | 224 | 230 | 165 |
| Union Depot | 915 | 973 | 795 |
| **Total** | **2050** | **2182** | **1774** |

### D. COMMUTER RAIL SCENARIO

In this modeled scenario, the transit market in the study corridor was served by commuter rail and supplemental buses. The commuter rail served the peak period market between Red Wing and Minneapolis, while the supplemental buses served the off-peak period market between Hastings and St. Paul. In addition, a shuttle bus route operated during the peak periods between Cottage Grove and Newport Stations and functioned as a feeder route to the commuter rail stations as well as a local route. Table 10 shows the average weekday boarding summary by station.

**Table 10 – Average Weekday Boarding Summary for 2030 Commuter Rail Scenario**

| Station / PNR Location | Total Boardings | |
|---|---|---|
| | Commuter Rail | Supplemental Bus |
| Red Wing | 15 | *No Service* |
| Prairie Island | 2 | |
| Hastings | 241 | 53 |
| Cottage Grove | 233 | 84 |
| Newport | 228 | 116 |
| Lower Afton | 141 | 51 |
| Union Depot | 664 | 198 |
| Minneapolis | 112 | *No Service* |
| **Total** | **1636** | **502** |

## 5. 2030 TRANSIT RIDERSHIP ANALYSIS OF OPTIONS MOVED FORWARD

This section describes the method for converting the information gathered from the scenario modeling exercise into ridership forecasts for the transit service options that were carried forward in the AAU. This method used manual calculations based on the output of the modeling exercise.

### A. NO BUILD (CURRENT CONDITIONS) OPTION

In the No Build (Current Conditions) Option, the three express bus routes that currently serve the corridor were retained, but enhanced over time to meet demand. The ridership forecast for the modeled scenario in this alternative was 1308. The study option in this alternative was the same as the modeled option, so there was no change to the ridership estimate. See Table 7 for a summary of the forecast ridership.

### B. EXPRESS BUS OPTION

In this option, a new express bus route was provided as an overlay service to the express routes described in the No Build (Current Conditions) Option. This additional route served Red Wing, Prairie Island, Hastings, Newport, Union Depot, and downtown

Minneapolis. To estimate the ridership on the new route, the 2030 boardings developed from the modeled express bus scenario were used as a starting point. The new route in this option was different than the modeled scenario in that it was one way, did not stop at Cottage Grove and Lower Afton Road Stations, and only operated in the peak period.

To calculate the new ridership totals, boardings at Cottage Grove and Lower Afton Road Stations were removed. Trips that were destined for Cottage Grove were also removed. In addition, boardings that were made in the non-peak direction were removed. The mark-ups Table 11 below illustrate the revisions.

**Table 11 – Manual Adjustments to the 2030 Express Bus Scenario Ridership Forecasts**

| Station / PNR Location | New Route | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Peak - AM | | | | | | | |
| | In-Bound | | | Out-Bound | | | Total | |
| | Boarding | Alighting | In-Vehicle | Boarding | Alighting | In-Vehicle | Boarding | Alighting |
| Red Wing | 7 | 0 | 7 | 0 | 26 | 0 | 7 | 26 |
| Prairie Island | 2 | 0 | 9 | 0 | 0 | 26 | 2 | 0 |
| Hastings | 60 | 3 | 66 | 0 | 0 | 26 | 60 | 3 |
| Cottage Grove | ~~222~~ | ~~10~~ | 278 | 17 | 58 | 26 | 239 | 68 |
| Newport | 57 | 8 | 327 | 8 | 47 | 67 | 65 | 55 |
| Lower Afton | ~~93~~ | ~~0~~ | 420 | 1 | 0 | 106 | 94 | 0 |
| Union Depot | 0 | 261 | 159 | 92 | 6 | 105 | 92 | 267 |
| Minneapolis | 0 | 2 | 157 | 0 | 0 | 19 | 0 | 2 |
| Target Corner | 0 | 154 | 3 | 0 | 0 | 19 | 0 | 154 |
| 5th St Transit Center | 0 | 3 | 0 | 19 | 0 | 19 | 19 | 3 |
| **Total** | **441** | **441** | | **137** | **137** | | **578** | **578** |

The resulting ridership table for the AM Peak is shown in Table 12.

Table 12 – Modified Boardings for the Express Bus Scenario

| Station / PNR Location | New Route | | |
|---|---|---|---|
| | Peak - AM | | |
| | In-Bound | | |
| | Boarding | Alighting | In-Vehicle |
| Red Wing | 7 | 0 | 7 |
| Prairie Island | 2 | 0 | 9 |
| Hastings | 50 | 3 | 56 |
| Newport | 57 | 8 | 105 |
| Union Depot | 0 | 80 | 25 |
| Minneapolis | 0 | 0 | 25 |
| Target Corner | 0 | 25 | 0 |
| 5th St Transit Center | 0 | 0 | 0 |
| **Total** | **116** | **116** | |

With enhanced travel time, achieved by skipping stops at Cottage Grove and Lower Afton Road Station, ridership forecasts were increased by a small amount, as shown in Table 13, to reflect an increased willingness to ride transit when the travel times are reduced.

Table 13 – Calculated Ridership for Express Bus Option

| Station / PNR Location | New Route | | |
|---|---|---|---|
| | Peak - AM | | |
| | In-Bound | | |
| | Boarding | Alighting | In-Vehicle |
| Red Wing | 7 | 0 | 7 |
| Prairie Island | 2 | 0 | 9 |
| Hastings | 55 | 3 | 61 |
| Newport | 62 | 8 | 115 |
| Union Depot | 0 | 85 | 30 |
| Minneapolis | 0 | 0 | 30 |
| Target Corner | 0 | 30 | 0 |
| 5th St Transit Center | 0 | 0 | 0 |
| **Total** | **126** | **126** | |

The ridership forecasting model assumes symmetrical ridership patterns or the AM and PM peaks, so this route would have the same number of riders in the PM peak and a total daily ridership of 252.

Table 14 – 2030 Daily Ridership of New Overlay Express Bus Route in Express Bus Option

| New Express Route Station / PNR Location | Boardings |
|---|---|
| Red Wing | 7 |
| Prairie Island | 2 |
| Hastings | 58 |
| Newport | 70 |
| Union Depot | 85 |
| Minneapolis | 0 |
| Target Corner | 30 |
| 5th St Transit Center | 0 |
| **Total** | **252** |

Combined with the ridership for the existing set of express routes (see Table 7), the total ridership forecast for the express bus option is 1560. This assumes that the introduction of the express bus route will not significantly change the demand for the existing routes, even though it is possible that some passengers may switch from the existing routes to the new overlay express bus route if it is more convenient for them.

It should be noted that the modelers were confident in the total ridership developed for each scenario, but cautioned against putting too much reliance on ridership at individual stations; there is therefore a lower level of confidence in this manually calculated ridership estimate than in the scenario estimates generated directly by the Travel Demand Model.

### C. BRT OPTION

In this option, there is BRT service connecting Hastings to Union Depot. This service has intermediate stops in Cottage Grove, Newport, and Lower Afton Road. Various enhancements are provided for bus services, including dedicated bus ramps at Cottage Grove and Lower Afton Road Stations, to improve travel time and reliability. This service was provided in conjunction with the services described in the No Build (Current Conditions) Options. The express bus services were assumed be able to make use of the special ramps, too.

The ridership forecast for the modeled scenario in this alternative was 2182. However, it was assumed that investments in the area around Newport Station to improve BRT travel times would not be made in the study option in this alternative. The modelers had developed ridership forecasts for an option with higher travel times, but the same

headways as the study option, and so these were used instead as the starting point for the ridership calculations. The number was 2050 boardings per day.

It was then requested that the existing express bus routes be retained in the study option. The ridership impacts of incorporating the existing express bus routes into this scenario were considered route by route. There were a number of assumptions for the routes:

- Route 365 would retain all of its riders. It would also reduce the number of boardings on the BRT route by 450, presumably those passengers who were destined for downtown Minneapolis would prefer Route 365 to the BRT route which would require a transfer.
- Route 364 would retain all of its riders, and all of those riders would be taken from the BRT route.
- Route 361 would serve a similar market to the BRT and would retain only about 215 riders, with the rest of its riders using the BRT service.

The ridership distribution is summarized below.

**Table 15 – 2030 Weekday Ridership – BRT Route – BRT Option**

| Station / PNR Location | Boarding |
|---|---|
| Hastings | 102 |
| Cottage Grove | 204 |
| Newport | 436 |
| Lower Afton | 114 |
| Union Depot | 636 |
| **Total** | **1,492** |

**Table 16 – 2030 Weekday Ridership – Route 361 – BRT Option**

| Station / PNR Location | Boarding |
|---|---|
| Ivystone Ave / Indian Blvd | 93 |
| Cottage Grove PNR | 7 |
| HWY 61 and Lower Afton Rd | 8 |
| 5th St and Minnesota St, St. Paul | 93 |
| 5th St and 7th St, St. Paul | 14.5 |
| **Total** | **215** |

Table 17 – 2030 Weekday Ridership – Route 364 – BRT Option

| Station / PNR Location | Boarding |
|---|---|
| Hadley Ave and 80th ST, Cottage Grove | 18 |
| Lincoln Ave and 85th St, Cottage Grove | 21 |
| 3rd st and Pullman Ave, Cottage Grove | 9 |
| 4th Ave and 4th St, Cottage Grove | 16 |
| Newport Transit Station | 7 |
| 5th St and Minnesota St, St. Paul | 34 |
| 5th St and 7th St, St. Paul | 11 |
| **Total** | **116** |

Table 18 – 2030 Weekday Ridership – Route 365 – BRT Option

| Station / PNR Location | Boarding |
|---|---|
| Cottage Grove PNR | 257 |
| HWY 61 and Lower Afton Rd | 43 |
| 6th St and Hennepin Ave, Minneapolis | 99 |
| Ramp B_5th Transit Center, Minneapolis | 201 |
| **Total** | **600** |

It should be noted that the modelers were confident in the total ridership developed for each scenario, but cautioned against putting too much reliance on ridership at individual stations; there is therefore a lower level of confidence in this manually calculated ridership estimate than in the total boarding estimates developed for the scenarios with the Travel Demand Model.

### D. COMMUTER RAIL OPTION

In the commuter rail option, a commuter rail service would replace the three express bus routes in the No Build (Existing Conditions) Option. The service would operate in the peak periods only and include four inbound trains in the AM peak and four outbound trains in the PM peak, as well one train in the off-peak direction for both the AM and PM peak. The result would be five inbound and five outbound trips per day.

The ridership forecast for the modeled scenario in this alternative was 2138. However, it was assumed that the supplemental bus service associated with this option would not be included in the study option. The resulting ridership estimate was 1638, which was calculated by subtracting the boardings on the supplemental bus route. This estimate

assumes that everyone traveling inbound during the AM peak would travel outbound during the PM peak (in other words, there were no customers who regularly traveled by train in one direction and by bus in the other - if this were the case, then not all of the boardings on the train trips would be retained in the study option in this alternative).

The summary is shown in Table 19.

**Table 19 – Average Weekday Boarding Summary for 2030 Commuter Rail Option**

| Station / PNR Location | Boardings |
|---|---|
| Red Wing | 15 |
| Prairie Island | 2 |
| Hastings | 241 |
| Cottage Grove | 233 |
| Newport | 228 |
| Lower Afton | 141 |
| Union Depot | 664 |
| Minneapolis | 112 |
| **Total** | **1636** |

## 6. OVERALL SUMMARY OF 2030 RIDERSHIP FORECASTS

A summary of the ridership forecasts of the four options is shown in Table 20.

**Table 20 – Summary of Daily Weekday Ridership Forecasts**

| | No Build (Current Conditions) | Express Bus | BRT | Commuter Rail |
|---|---|---|---|---|
| **Weekday Ridership** | **1308** | **1560** | **2423** | **1636** |