



## **11.0 ECONOMIC OPPORTUNITY AND INVESTMENT, AND COMMUNITY AND ENVIRONMENT ISSUES**

### **11.1 Introduction**

Significant evaluation criteria related to opportunity and investment, environmental and community issues assisted the Rush Line Corridor Task Force in determining which alternative best met project goals and Corridor transportation needs. The nine transit alternatives were analyzed with regards to the potential impact on economic opportunity and investment and communities and environment using criteria approved by the Rush Line Study Team at the July 2008 Meeting. At that meeting, it was determined that the evaluation would be based on the following factors:



#### **Economic Opportunity and Investment**

- Employment within Station Areas
- Population within Station Areas
- Transit-Oriented Development Potential at Stations
- Economic Development Potential at Stations

#### **Communities and Environment**

- Transit-Dependent Population within Station Areas
- Potentially Affected Households by Noise and Vibration
- Potentially Affected Natural Environment and Cultural Resources
- Right-of-Way Impacts
- Change in Vehicle Miles of Travel
- Change in CO<sub>2</sub> Emissions
- Non-Motorized Access

Each of the criteria was evaluated on a five-level scale, from “Very Good” to “Very Poor”. This evaluation was done before the potential station locations were finalized. As a result, stations were often located where there was a minimal potential effect on the natural environment. Stations were also located where there was a maximum potential for economic opportunity and investment. More detail on methodology and results can be found in the “Economic Opportunity and Investment, and Community and Environment Analysis Methodology and Results” technical memorandum included in this report as **Appendix M**.

## 11.2 Specific Evaluation Criteria

There are specific parameters for each evaluation criteria to quantify which rating it should receive on the five-level scale of “Very Good” to “Very Poor.” The tables in this section show the criteria, rating and definition. For several evaluation criteria which are judged on a qualitative basis, there are no tables. Instead, there is a brief summary that describes what merits a favorable or unfavorable ranking.

### 11.2.1 Population Within Station Areas

Population near stations was evaluated based on Census Block Group data for the 2000 Census. It was assumed that population is evenly distributed throughout the Census Block Group. Using Geographic Information Systems (GIS), station areas were defined by one-half mile and three-mile buffers around the proposed stations. The one-half mile buffers were used for the alignments that provided service only within the Twin Cities Metropolitan area, as a one-half mile is the maximum distance most people are willing to walk to access transit. A three-mile buffer was used for alternatives providing service to Hinckley to reflect that commuters traveling 50 miles or more may use transit if they live within three miles of a transit station with service to their place of employment. The population of the Block Groups that were inside the buffer was included in the total population and for the station. The population of the block groups partially within the buffer was prorated based on the proportion of the area within the buffer. For example, if a block group had 180 people, it and one-third of the area of the block group was within the one-half mile buffer, then 60 people from the block group would be included in the population within one-half mile of the station.

To avoid double counting persons who may live within one-half mile of multiple proposed stations, the above procedure was followed to report the population at each of the proposed stations. Some stations that were located within one mile (or six miles when the three-mile buffers were used) of each other create an overlap when using the same methodology to determine the population that is within the buffer of multiple stations. To address this issue, the persons who are in the buffer of more than one station were then subtracted from the sum of the population within one-half mile of the a station on the alignment. As result the total number of people who live within with one-half mile of the stations along the alignment maybe different then the sum of the number of people who live within one-half mile of each station along the alignment. The total population within one-half mile of a station was then divided by the number of stations included in the alternative to ensure that the alternatives were not unfairly biased toward alternatives with more stations. **Tables 11-1** and **11-2** show how the data were stratified according to the five-point ranking system described at the beginning of this chapter.

**Table 11-1: Average Population within Half Mile of a Station**

Average Population within Half Mile of a Station			
Average Population	Rating	Definition	
Greater than or equal to 3,000	●	Very Good	Alternative meets criterion very well
2,500 - 2,999	●	Good	Alternative meets criterion well
1,500 - 2,499	⊙	Fair	Alternative meets criterion sufficiently
500 - 1,499	⊙	Poor	Alternative does not meet criterion
Less than 500	○	Very Poor	Alternative significantly does not meet criterion

**Table 11-2: Average Population within Three Miles of a Station**

Average Population within Three Miles of a Station			
Average Population	Rating	Definition	
Greater than or equal to 30,000	●	Very Good	Alternative meets criterion very well
25,000 - 29,999	●	Good	Alternative meets criterion well
15,000 - 24,999	⊙	Fair	Alternative meets criterion sufficiently
5,000 - 14,999	⊙	Poor	Alternative does not meet criterion
Less than 5,000	○	Very Poor	Alternative significantly does not meet criterion

### 11.2.2 Employment within Station Areas

A similar approach was used to determine the number of employees within the station areas. However, instead of using Census Block Group data, the number of employees was based on Transportation Analysis Zones (TAZ). The Metropolitan Council's estimates of employment in 2000 within TAZ were used for the Twin Cities Metropolitan Area. Chisago County provided the 2005 employment data by TAZ used in the County Transportation Plan. The Minnesota State Demographer's employment estimates for 2005 by city and county were used for the remainder of the Rush Line Corridor (i.e. Pine County). **Tables 11-3** and **11-4** show how data is stratified to correspond with the five-level ranking system developed for this study.

**Table 11-3: Average Employment within Half-Mile of a Station**

Average Employment within Half Mile of a Station			
Average number of jobs	Rating	Definition	
Greater than or equal to 3,000	●	Very Good	Alternative meets criterion very well
2,500 - 2,999	●	Good	Alternative meets criterion well
1,500 - 2,499	⊙	Fair	Alternative meets criterion sufficiently
500 - 1,499	⊙	Poor	Alternative does not meet criterion
Less than 500	○	Very Poor	Alternative significantly does not meet criterion

**Table 11-4: Average Employment within Three Miles of a Station**

Average Employment within Three Miles of a Station			
Average number of jobs	Rating	Definition	
Greater than or equal to 15,000	●	Very Good	Alternative meets criterion very well
10,000 - 14,999	●	Good	Alternative meets criterion well
5,000 - 9,999	⊙	Fair	Alternative meets criterion sufficiently
2,500 - 4,999	⊙	Poor	Alternative does not meet criterion
Less than 2,500	○	Very Poor	Alternative significantly does not meet criterion

### 11.2.3 Transit-Oriented Development Potential within Station Areas

Transit-oriented development is mixed-use development, typically multi-family residential and commercial, developed on a pedestrian scale along major transit lines. A key component to successful

transit-oriented development is the presence of a safe pedestrian environment. Alternatives with stations away from freeways were rated as better meeting the goals of the project than those with stations adjacent to freeways. A 2007 study conducted by the University of Minnesota identified that pedestrian crash hot spots tended to be located at freeway interchanges that had mixed-use development, in particular multi-family residential and retail. This study indicates that building mixed-use, transit-oriented developments in proximity to freeway interchanges will tend to result in a high pedestrian crash rates. It is unlikely that a safe pedestrian environment and thus a successful transit-oriented development will result at station locations that are dominated by a freeway interchange. The alternatives that utilized active freight rail lines were not scored highly because transit-oriented development tends not to be the highest and best use along freight rail lines. Light Rail Transit alternatives were scored higher because of local and national examples available of transit-oriented development around LRT, such as Bloomington Central Station, Bloomington, MN, and Hayward City Center, Hayward CA.

#### 11.2.4 Economic Development Potential

The alternatives were evaluated based on the existing and likely future economic development pressure along the alignment. Along freeways, the vast majority of people accessing the station area will so do via automobile, resulting in large parking requirements, such layouts tend not to be pedestrian-, or transit-friendly. Industrial land uses tend to be the predominant land use along active freight rail lines. Industrial land uses tend not to benefit from transit improvements, primarily because access to materials tends to be more important to industrial businesses than access to people. Light Rail Transit alternatives were given a premium because of local and national experience among developers around light rail transit.



#### 11.2.5 Transit-Dependent Population

**Table 11-5: Average Transit Dependent Population within Half Mile of a Station**

Average Transit Dependent Population within Half Mile of a Station			
Average Population	Rating	Definition	
Greater than or equal to 750	●	Very Good	Alternative meets criterion very well
500 - 749	◐	Good	Alternative meets criterion well
250 - 499	◑	Fair	Alternative meets criterion sufficiently
100 - 249	◒	Poor	Alternative does not meet criterion
Less than 100	○	Very Poor	Alternative significantly does not meet criterion

#### 11.2.6 Year 2030 Change in Daily Regional Vehicle Miles Traveled

The Metropolitan Council’s *Twin Cities Regional Travel Demand Forecast Model* was used to estimate the daily Vehicle Miles Traveled (VMT) for each of the proposed alternatives. However, the analysis showed that the change in VMT for all alternatives was within +/-0.1 percent of the 2030 VMT for the Transportation System Management (TSM) alternative. This resulted in all alternatives being given a “Fair” rating. Table 11-6 shows how the scoring system used to evaluate the alternatives.

**Table 11-6: Change in Daily Regional Vehicle Miles Traveled (VMT)**

Change in VMT			
Percent Change in VMT	Rating	Definition	
Decrease of 1 percent or more	●	Very Good	Alternative meets criterion very well
Decrease 0.1 to 1 percent	●	Good	Alternative meets criterion well
-0.1 to +0.1 percent change	⊙	Fair	Alternative meets criterion sufficiently
Increase 0.1 to 1 percent	⊙	Poor	Alternative does not meet criterion
Increase of more than 1 percent	○	Very Poor	Alternative significantly does not meet criterion

**11.2.7 Year 2030 Change in Annual CO2 Emissions**

The Federal Transit Administration (FTA) has a formula for determining the change in Carbon Dioxide (CO<sub>2</sub>) Emissions as a function of change in VMT. However, due to the lack of variation in the change in VMT, there was also no change in the CO<sub>2</sub> Emissions. This resulted in all alternatives being given a “Fair” rating. Table 11-7 shows how the scoring system used to evaluate the alternatives.

**Table 11-7: Change in Carbon Dioxide Emissions**

Change in Carbon Dioxide Emissions			
Percent Change in VMT	Rating	Definition	
Decrease of 1 percent or more	●	Very Good	Alternative meets criterion very well
Decrease 0.1 to 1 percent	●	Good	Alternative meets criterion well
-0.1 to +0.1 percent change	⊙	Fair	Alternative meets criterion sufficiently
Increase 0.1 to 1 percent	⊙	Poor	Alternative does not meet criterion
Increase of more than 1 percent	○	Very Poor	Alternative significantly does not meet criterion

**11.2.8 Noise and Vibration**

**Table 11-8: Households within 100 ft. of Alignment (Noise & Vibration)**

Households within 100 feet of Alignment (Noise & Vibration)			
Households per Mile	Rating	Definition	
Less than 5	●	Very Good	Alternative meets criterion very well
5 - 10	●	Good	Alternative meets criterion well
11 - 20	⊙	Fair	Alternative meets criterion sufficiently
21 - 25	⊙	Poor	Alternative does not meet criterion
More than 25	○	Very Poor	Alternative significantly does not meet criterion

**11.2.9 Natural Environment and Cultural Resources**

The potential impact to the natural environment was determined using aerial photography of the Corridor and identifying sensitive aspects of the natural environment (e.g. rivers, streams, lakes, wetlands, parks). In addition to aerial photography, Federal Emergency Management Agency (FEMA) flood plain maps were used to identify if potential station locations have a greater than one percent chance of flooding. Potential impact to historical resources was also included in these criteria as it is also subject to Section 4f regulations. The National Historic Register was used to identify the historical resources within one hundred feet of a proposed station location. The total number of environmental sensitive and historic properties near a



station for each alternative was divided by the number of stations. Table 11-9 shows how the alignments were ranked using the five-level ranking system.

**Table 11-9: Potentially Affected Natural Environment and Historical Sites within 100 ft. of Stations**

Potentially Affected Natural Environment and Historical Sites within 100 ft of Stations			
Sites per Station	Rating	Definition	
Less than 0.50	●	Very Good	Alternative meets criterion very well
0.50 - 0.75	●	Good	Alternative meets criterion well
0.76 - 1.00	⊙	Fair	Alternative meets criterion sufficiently
1.01 - 1.25	⊙	Poor	Alternative does not meet criterion
More than 1.25	○	Very Poor	Alternative significantly does not meet criterion

### 11.2.10 Public Right-of-Way

Each of the proposed alignments were examined to identify potential right-of-way restrictions. Due to the relative different costs associated with addressing various types of right-of-way restrictions, weights were assigned based on complexity in addressing each restriction. For example, the cost of rebuilding a bicycle trail is less than the cost of rebuilding a freight railroad wye and would be rated lower. Table 11-10 shows the types of right-of-way restrictions and the relative weight assigned to each type. The impacts of each alternative’s restrictions were added together to determine its overall right-of-way score. This results in an alternative receiving a score of 10 to account for two grade-separated crossings and one at-grade crossing. Table 11-11 shows how these scores were divided into five-levels, where a lower score indicates a more desirable alternative.

**Table 11-10: Points per Right-of-Way Potential Restriction**

Points per right-of-way potential restriction	
At-grade crossings	2
Freight Rail Wye	10
Grade separated crossings	4
Pedestrian/Bicycle Crossings	1
Railroad	3
Water	4

**Table 11-11: Right-of-Way**

Right-of-Way			
Right-of-Way Score	Rating	Definition	
Fewer than 100	●	Very Good	Alternative meets criterion very well
101-200	●	Good	Alternative meets criterion well
201-300	⊙	Fair	Alternative meets criterion sufficiently
301-400	⊙	Poor	Alternative does not meet criterion
More than 400	○	Very Poor	Alternative significantly does not meet criterion

### 11.2.11 Non-Motorized Access

Each of the proposed alternatives was examined to identify the number of non-motorized facilities and the relative ease with which someone could access the proposed stations by walking and bicycling. This qualitative analysis included examining the connectivity of the sidewalks in the neighborhoods surrounding each of the stations. In addition to examining the pedestrian connections within each of the

stations neighborhoods, non-motorized access also included the relative ease with which an individual could connect to the Twin Cities' extensive network of non-motorized, multi-modal facilities. Several key links in the Corridor were to the Bruce Vento Regional Trail, Gateway Trail, William Munger Trail, Sunrise Prairie Trail and Hardwood Creek Trail.

### **11.3 Results**

Using the criteria described above, each of the alternatives was evaluated to determine how well they meet the goals of the Rush Line Corridor. The results of these evaluations are presented in Table 11-12.

- Alternatives along the County Regional Railroad Authority right-of-way tended to score better on economic opportunity and investment criteria (BRT Alternatives 2A and 2B and LRT Alternatives 1A and 1B).
- BRT Alignments along I-35/I-35E (BRT Alternatives 1A and 1B) ranked as better meeting the goals of project for impacting fewer households potentially affected by noise and vibration and having fewer potential impacts to the natural environment.
- Alternatives along the County Regional Railroad Authority right-of-way better meet the evaluation criteria because they provided more connections to non-motorized, multi-modal transportation and right-of-way restrictions (BRT Alternatives 2A and 2B and LRT Alternatives 1A and 1B).
- Commuter Rail Alternatives 1A and 1B overall did not score as well as other alternatives.

Table 11-12: Summary of Detailed Evaluation

## Summary of Evaluation

Criteria	No-Build	TSM	Bus Rapid Transit		Commuter Rail		Light Rail Transit				
			Alternative 1A (I-35A-35E to Hickory)	Alternative 1B (I-35A-35E to Forest Lake)	Alternative 2A (RCRRA ROW to White Bear Lake)	Alternative 2B (County RRA ROW to Forest Lake)	Alternative 1A (County RRA ROW to Hickory)	Alternative 1B (RCRRA ROW to Maplewood/White Bear Lake) <sup>7</sup>	Alternative 1B (RCRRA ROW to White Bear Lake w/ downtown thru route)	Modified Alternative 1B (RCRRA ROW to White Bear Lake)	
<b>Length of Alignment (Miles)</b>			78.9	26.3	9.9	21.5	77.4	7.1	10.9	10.9	
<b>Number of Stations</b>			17	10	9	11	14	7	9	11	
<b>Transportation and Mobility</b>											
2030 Average Weekday Ridership (Thousands)	n/a	n/a	5,832	5,150	4,730	5,350	1,040	3,390	6,480	8,780	
2030 New Commuter Riders vs. No-Build	n/a	4,430	6,790	6,690	4,460	4,890	1,490	1,290	6,330	8,570	
Capital Cost (2008 dollars) (Millions)	\$18.8	\$39.1	\$510.7	\$189.3	\$120.6	\$173.4	\$754-\$993	\$270.1	\$407.1	\$441.2	
Operating and Maintenance Cost (2008 dollars) (Millions)	\$9.9	\$8.7	\$16.5	\$14.6	\$10.9	\$11.7	\$96.8	\$38.3	\$11.6	\$19.9	
Cost per New Commuter Rider vs. No-Build <sup>1,2</sup>	n/a	\$7.34	\$31.30	\$14.77	\$14.27	\$17.19	\$391.23	\$20.44	\$26.99	\$27.88	
<b>Economic Opportunity and Investment</b>											
Population Near Stations <sup>3</sup>	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Employment Near Stations <sup>5</sup>	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Transit-Oriented Development Potential at Stations	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Economic Development Potential at Stations	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
<b>Communities and Environment</b>											
Transit-Dependent Population within One-Half Mile of Station	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Potentially Affected Households within 100 Feet of Alignment <sup>4</sup>	●	●	●	●	●	●	●	●	●	●	●
Potentially Affected Natural Environmental within 100 Feet of Stations	●	●	●	●	●	●	●	●	●	●	●
Change in Vehicle Miles Traveled	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Change in Carbon Emissions	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Connections to Non-Motorized Transportation	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Right-of-Way Restrictions	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
<b>Public Involvement</b>											
Public Sentiment (As of October 2008) <sup>6</sup>	n/a	n/a	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

<sup>1</sup>Capital Costs were calculated by a factor of 10 percent. FTA standard cost Categories indicate a range of 7 to 120 percent depending on the category. For example, stationing (US \$ per station mile below) are 10 percent. A project must receive a goal score of 100% to be eligible to receive funding. The typical improvement is 50 percent of goal.

<sup>2</sup>Population and Employment near stations are required for a three-mile area around stations for alternatives that provide service within 100 feet of stations. Stationing is required for alternatives that provide service within 100 feet of stations. Stationing is required for alternatives that provide service within 100 feet of stations.

<sup>3</sup>Population and Employment near stations are required for a three-mile area around stations for alternatives that provide service within 100 feet of stations. Stationing is required for alternatives that provide service within 100 feet of stations.

<sup>4</sup>Population and Employment near stations are required for a three-mile area around stations for alternatives that provide service within 100 feet of stations. Stationing is required for alternatives that provide service within 100 feet of stations.

<sup>5</sup>Population and Employment near stations are required for a three-mile area around stations for alternatives that provide service within 100 feet of stations. Stationing is required for alternatives that provide service within 100 feet of stations.

<sup>6</sup>Public Sentiment was calculated by a factor of 10 percent. FTA standard cost Categories indicate a range of 7 to 120 percent depending on the category. For example, stationing (US \$ per station mile below) are 10 percent. A project must receive a goal score of 100% to be eligible to receive funding. The typical improvement is 50 percent of goal.

<sup>7</sup>Population and Employment near stations are required for a three-mile area around stations for alternatives that provide service within 100 feet of stations. Stationing is required for alternatives that provide service within 100 feet of stations.

⊙ Recommended for Advanced Conceptual Design

Rating	Definition
●	Very Good
⊙	Good
⊙	Fair
⊙	Poor
⊙	Very Poor