

## Introduction

The Phase 1 and Phase 2 evaluations were designed to screen the long list of potential streetcar corridors developed at the beginning of the study to a long-term network of streetcar lines that would improve public transit options and stimulate economic development. The Phase 1 process screened 30 corridors down to 17. Then, nineteen potential streetcar lines were developed that could operate in the 17 corridors. These 19 lines were then evaluated using the Phase 2 evaluation criteria, which were:

### **Primary Criteria**

- Potential Demand
- Transit Supportive Land Use
- Development Potential

### **Supplemental Criteria**

- Special Use Generators and Corridor Anchors
- Transit Speed and Reliability
- Integration with Existing Bus Service
- Streetcar Operating Costs
- Pedestrian Environment
- Equity
- Community Support
- Relationship to Current/Future High Capacity Transit Investments
- On-Street Parking Impact
- Conceptual Capital Costs

The evaluation results for each of the Phase 2 criteria are described in separate documents; this document describes the overall results.

## Methodology

The proposed long-term network was developed as part of a three-step process:

1. First, each line was evaluated based on the three primary criteria, which were potential demand, land use, and development potential. These three criteria were considered to be the most important for the following reasons:
  - A. **Potential Demand:** First and foremost, streetcar lines provide transportation, and to be successful, they must be implemented in areas where there is sufficient demand for the type of service that they provide.
  - B. **Land Use:** Streetcar lines are most successful when they operate in areas where there is activity throughout the day and night, which are areas with mixed-use development. In areas with dominated by a single land use type (for example, residential or industrial), most activity occurs during commute hours, with much less activity during the midday and at night.
  - C. **Development Potential:** A second major benefit of streetcar service is that it can stimulate economic development, and this is an explicit goal for streetcar service in Saint

Paul. Areas that would provide the greatest potential are those where there is local demand for development, potential for mixed-use development, and a significant amount of undeveloped or underdeveloped land that could be redeveloped to higher value transit-oriented uses.

For these reasons, the first step in the development of the long-term network was to screen for consistency with the above three criteria, and lines that did not meet all three were eliminated.

2. Next, for the lines that met all three primary criteria, each was further examined to determine whether all three conditions would be met along the entire line. In cases where they would not, the lines were shortened to the lengths that would meet all three.
3. After the lines were screened based on the primary criteria, they were further screened using the supplemental criteria. This was done for two reasons:
  - A. To determine whether there were issues that could preclude the development of a specific line.
  - B. In cases where two lines would serve a similar area (Robert and Wabasha, and Payne and Maryland + Arcade) to determine which of the two would be more desirable.

In many respects, this was a process of elimination—the elimination of lines that did not meet the primary criteria, and the elimination of lines that would largely duplicate others. The remaining lines then became the recommended long-term network described below.

## Evaluation Results

### Primary Criteria

As described above, the lines, or segments of lines, included in the long-term network are those that would rank well (Best or Good) in terms of potential demand, land use, and development potential (see Figures, 1, 2, and 3, and Table 1). In terms of the primary criteria, the lines and segments of lines that would meet these conditions are:

- **Arcade + Maryland** overall rated Best for ridership and development potential and Good for Land Use. However, potential demand along Maryland Avenue is relatively low, leaving the segment between Maryland Avenue and downtown as the best suited for streetcar service.
- **East 7<sup>th</sup> Street** overall also rates Best for ridership and development potential and Good for land use. However, ridership and development potential is low beyond Hazelwood Street, leaving the segment between Hazelwood Street and downtown as the best suited for streetcar service.
- **Grand + Cleveland** overall rates Best for ridership and land use and Good for development potential. However, ridership and development potential past the University of Saint Thomas is low, and land use becomes much more residential. Thus, the segment best suited for streetcar service is between University of Saint Thomas and downtown.
- **Grand + Cretin** rated essentially the same as Grand + Cleveland, with strong potential performance between University of Saint Thomas and downtown, and low potential beyond there. The segment best suited for streetcar service is between University of Saint Thomas and downtown or the same as Grand + Cleveland.

Figure 1 – Composite Transit Index by Streetcar Segment (¼-mile radius)

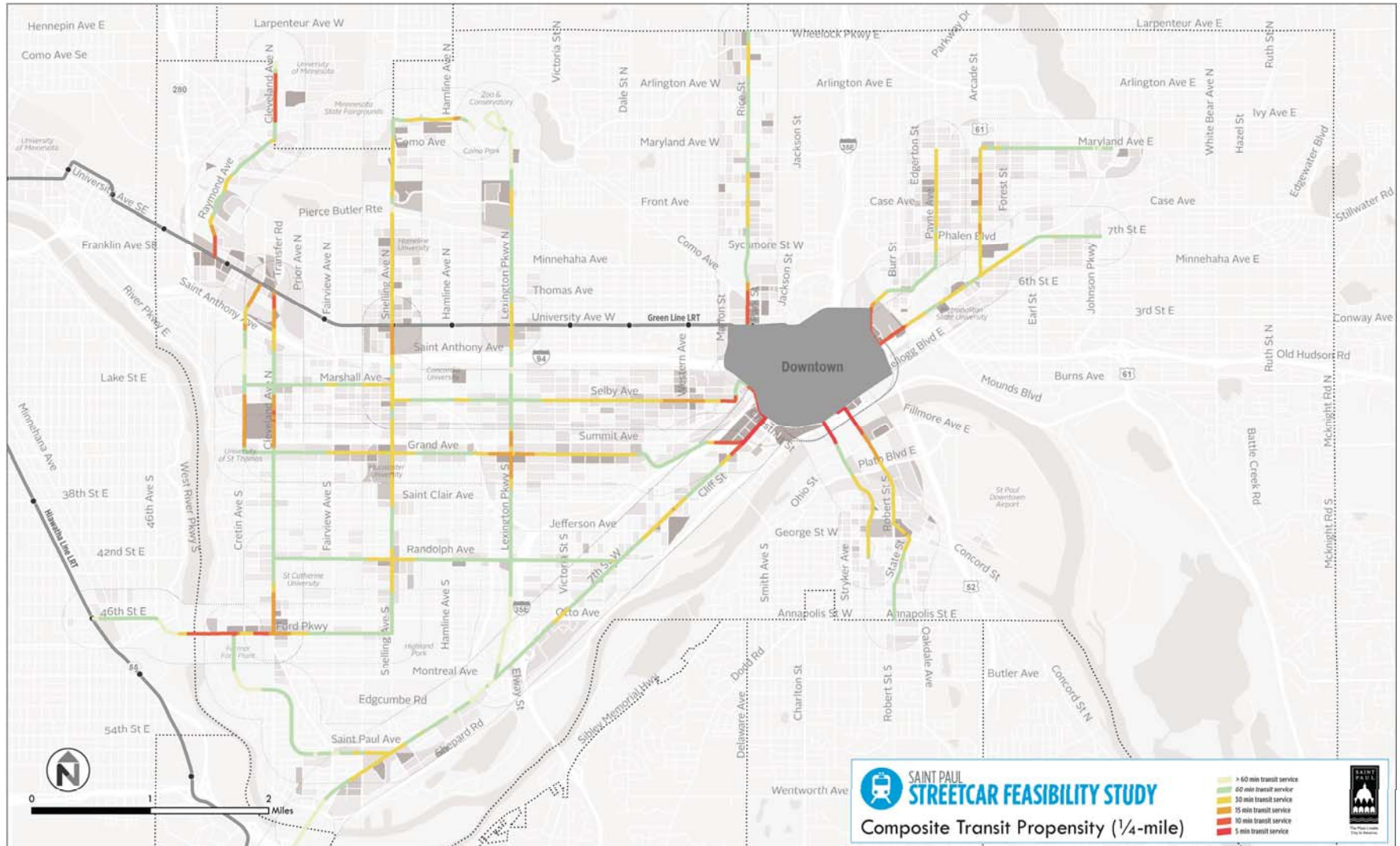


Figure 2 – Transit Supportive Land Uses (2030 Projected)

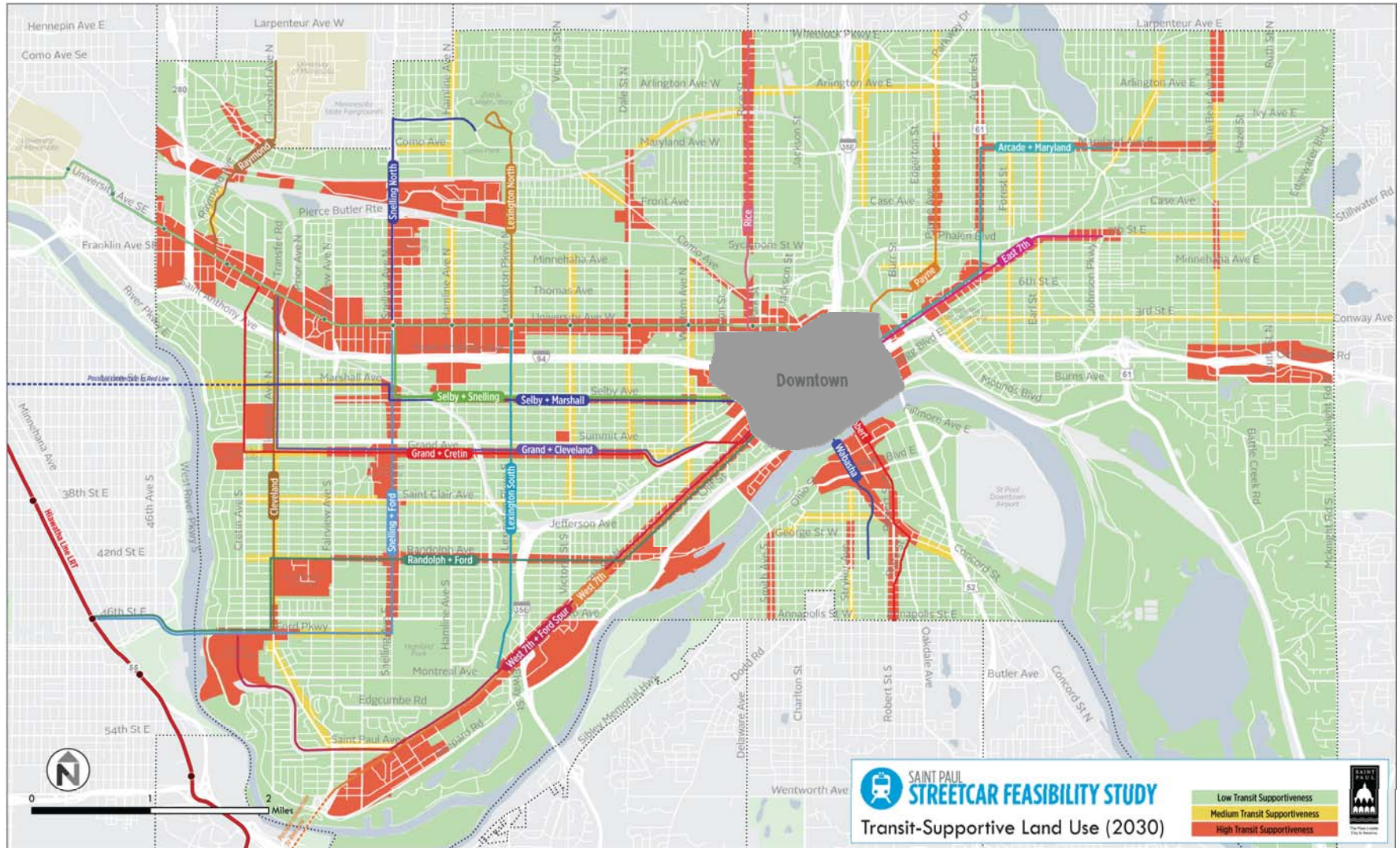
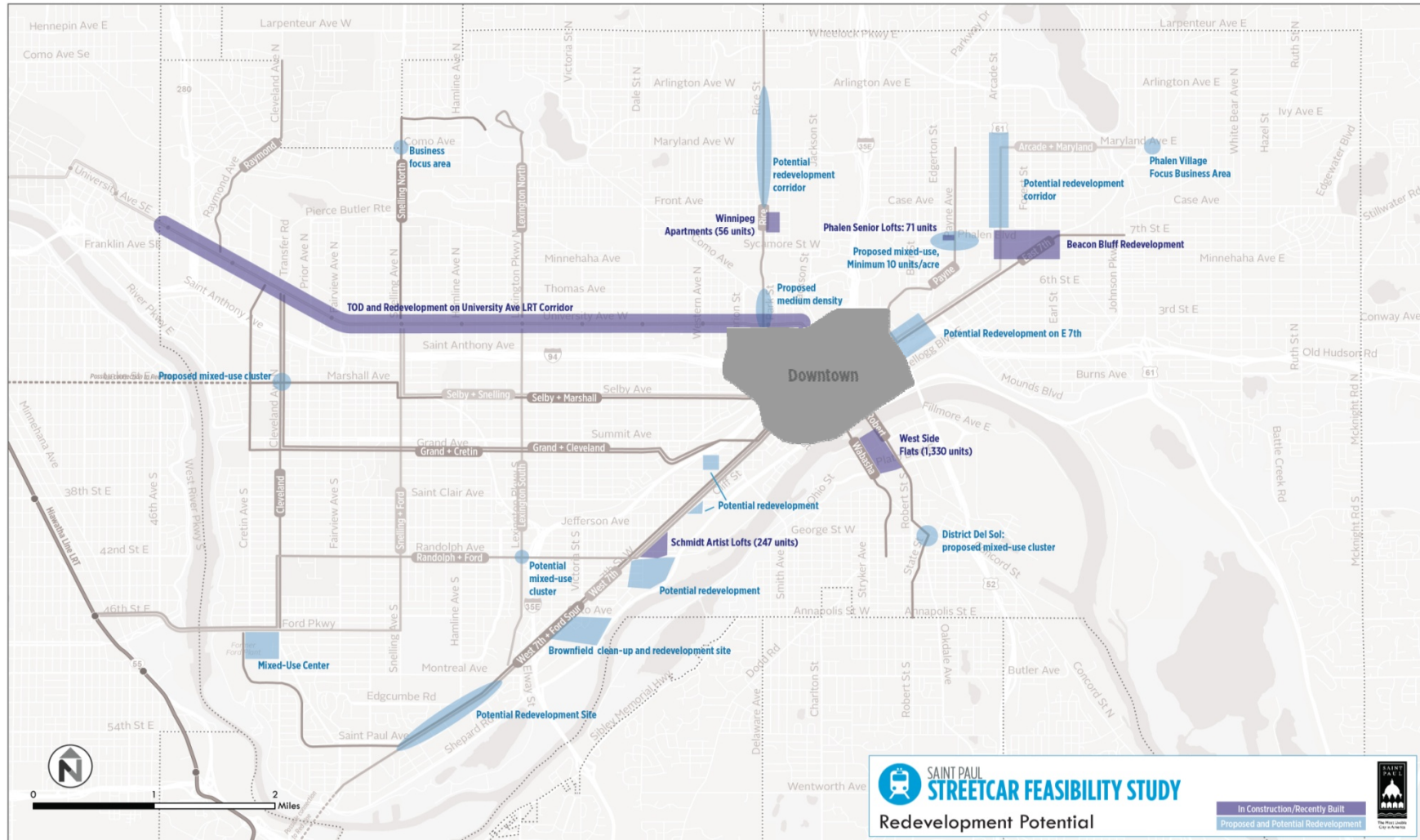


Figure 3 – Development Potential



**Table 1 – Primary Criteria Ratings and Strongest Segments**

Alternative	Ridership Potential	Land Use	Development Potential	Bring Forward?	Streetcar Supportive Segment
Arcade + Maryland	✓✓ Best	✓ Good	✓✓ Best	Yes	Maryland Ave – Downtown
Cleveland	✓ Good	▲ Fair	▲ Fair		
East 7 <sup>th</sup>	✓✓ Best	✓ Good	✓✓ Best	Yes	Hazelwood St - Downtown
Grand + Cleveland	✓✓ Best	✓✓ Best	✓ Good	Yes	University of Saint Thomas - Downtown
Grand + Cretin	✓✓ Best	✓ Good	✓ Good	Yes	University of Saint Thomas - Downtown
Lexington North	▲ Fair	▲ Fair	▲ Fair		
Lexington South	▲ Fair	▲ Fair	▲ Fair		
Payne	✓✓ Best	✓ Good	✓ Good	Yes	Entire Phase 2 Line (Maryland Ave - Downtown)
Randolph + Ford	▲ Fair	✓ Good	▲ Fair		
Raymond	▲ Fair	✓ Good	▲ Fair		
Rice	✓✓ Best	✓✓ Best	✓ Good	Yes	Entire Line City Line/Larpenteur Ave - Downtown
Robert	✓✓ Best	✓✓ Best	✓✓ Best	Yes	George St - Downtown
Selby + Marshall	✓✓ Best	✓✓ Best	✓ Good	Yes	Snelling Ave - Downtown
Selby + Snelling	✓✓ Best	✓✓ Best	✓ Good	Yes	Entire Line
Snelling + Ford	▲ Fair	✓ Good	✓ Good		
Snelling North	▲ Fair	✓ Good	▲ Fair		
Wabasha	✓✓ Best	✓✓ Best	✓✓ Best	Yes	George St - Downtown
West 7 <sup>th</sup>	✓✓ Best	✓✓ Best	✓✓ Best	Yes	Victoria Park - Downtown
West 7 <sup>th</sup> + Ford Spur	✓ Good	✓ Good	✓✓ Best	Yes	Victoria Park - Downtown

- **Payne** rated Best for potential demand and Good for land use and development potential, with strong potential through the end of the line at Maryland Avenue.
- **Rice** rated Best for potential demand and land use, and Good for development potential. The potential for each criterion varies throughout the line, but overall is good or better throughout the entire line between the city line and downtown.
- **Robert** overall ranked Best in all three categories. However, potential demand would be relatively low south of George Street, leaving the segment between George Street and downtown as providing the best potential for streetcar service.
- **Selby + Marshall** ranked Best for potential demand and land use, and good for development potential. However, the potential in all three areas, although somewhat variable, would be much

lower west of Snelling Avenue, and thus the segment between Lexington Parkway and downtown would have the highest potential.

- **Selby + Snelling** ranked Best in all three categories, and better than Selby + Marshall because of much stronger potential along Snelling Avenue between Selby Avenue and University Avenue than along Marshall Avenue west of Snelling Avenue, and because of the connection with the Green Line. The entire line would provide strong potential for streetcar service.
- **Wabasha**, similar to Robert overall ranked best in all three categories, and also with potential demand relatively low south of George Street. The rankings would be similar because both the Robert and Wabasha lines would serve much of the same area.
- **West 7<sup>th</sup>** ranked Best for potential demand and land use and Good for development potential. Potential is strong from the planned Victoria Park development (south of Otto Avenue) to downtown.
- **West 7<sup>th</sup> + Ford** ranked Good for potential demand and land use and Best for development potential. Compared to West 7<sup>th</sup>, potential demand and compatible land use are lower due to lower performance between Victoria Park and the former Ford plant, and development potential ranks higher due to the inclusion of the former Ford plant. In spite of the former Ford plant at the outer end, demand between there and Victoria part would be too low to justify the entire line, and the segment with strong streetcar potential would be the same as for West 7<sup>th</sup>, which would be between Victoria Park and downtown.

Seven lines would not be particularly well suited for streetcar service:

- **Cleveland**, due to low amounts of mixed-use development that would likely depress midday and evening ridership.
- **Lexington North**, which would rank low in terms of ridership demand, the amount of mixed-use development, and development potential.
- **Lexington South**, which similar to Lexington North, would also rank low in terms of ridership demand, the amount of mixed-use development, and development potential.
- **Randolph + Ford**, which, overall, would not have sufficiently high potential demand.
- **Raymond**, which would also not have sufficiently high potential demand.
- **Snelling + Ford**, which would have potentially strong demand at its north end near University Avenue and its south end at a redeveloped Ford plant. However, in between, there would be too many areas with only low to moderate ridership demand to sustain the line.
- **Snelling North**, which would not have sufficiently high ridership demand. (However, one exception would be the short segment to Hamline University, which as described further below, could be added to a Selby + Snelling line.)

Accounting for duplicate segments along different longer lines, the lines that would meet all primary criteria and that were then evaluated using the supplemental criteria were:

<u>Line</u>	<u>Origin-Destination</u>
<b>Arcade + Maryland</b>	Maryland Avenue - Downtown
<b>East 7<sup>th</sup></b>	Hazelwood Street - Downtown
<b>Grand + Cleveland</b>	University of Saint Thomas - Downtown
<b>Grand + Cretin</b>	<i>Same as Grand + Cretin</i>
<b>Payne</b>	Maryland Ave - Downtown
<b>Rice</b>	City Line/Larpenteur Avenue - Downtown
<b>Robert</b>	George Street - Downtown
<b>Selby + Marshall</b>	<i>Same as Selby + Snelling</i>
<b>Selby + Snelling</b>	Snelling Avenue - Downtown
<b>Wabasha</b>	George Street - Downtown
<b>West 7<sup>th</sup></b>	Victoria Park - Downtown
<b>West 7<sup>th</sup> + Ford Spur</b>	<i>Same as West 7<sup>th</sup></i>

### Supplemental Criteria

The lines and segments that were brought forward from the primary criteria evaluation were then further screened using the supplemental criteria to (1) determine whether there were issues that could preclude the development of a specific line, and (2) in cases where two lines would serve a similar area, which of the two would be more desirable. As summarized in Table 2, there would be some issues with all of the potential lines. However, none would be seen as sufficiently significant to preclude a line from further consideration:

Table 2 – Primary Criteria Ratings and Strongest Segments

Line	Supplemental Criteria								Eliminate Due to Secondary Criteria?
	Special Generators	Speed & Reliability	Transit Integration	Operating Costs	Ped Environment	Equity	Community Support	Parking Impacts	
Arcade+Maryland	✓ Good	✓✓ Best	▲ Fair	✓ Good	✓✓ Best	✓✓ Best	✓ Good	✓✓ Best	No
East 7th	✓ Good	✓✓ Best	▲ Fair	▲ Fair	✓ Good	✓✓ Best	✓✓ Best	✓✓ Best	No
Grand+Cleveland	✓✓ Best	✓ Good	✓ Good	✓ Good	✓✓ Best	✓ Good	✓ Good	✓ Good	No
Payne	✓ Good	✓ Good	▲ Fair	✓ Good	✓✓ Best	✓✓ Best	✓✓ Best	▲ Fair	No
Rice	✓ Good	✓ Good	▲ Fair	▲ Fair	✓ Good	✓✓ Best	✓✓ Best	✓✓ Best	No
Robert	▲ Fair	✓✓ Best	▲ Fair	✓ Good	✓ Good	✓ Good	✓✓ Best	▲ Fair	No
Selby+Snelling	✓✓ Best	▲ Fair	✓ Good	✓✓ Best	✓✓ Best	✓✓ Best	✓ Good	✓ Good	No
Wabasha	▲ Fair	✓ Good	▲ Fair	✓✓ Best	✓ Good	✓ Good	✓ Good	▲ Fair	No
W 7th	✓✓ Best	✓✓ Best	✓ Good	▲ Fair	▲ Fair	✓ Good	✓✓ Best	✓✓ Best	No



- **Special Use Generators:** Robert and Wabasha would serve an area that does not currently have any large special generators. However, they would both serve areas with the potential for the significant development, some of which could become special generators.
- **Speed and Reliability:** Selby + Snelling could experience delays along Selby Avenue and along Snelling Avenue near its intersection with I-94. More detailed analysis would be required as part of subsequent studies to determine how to best address these issues (for example, the line could connect with University Avenue via Hamline Avenue instead of Snelling Avenue).
- **Transit Integration and Operating Costs:** Streetcar service would be designed largely to serve local trips, while many Metro Transit services are designed to service both local and regional trips. Metro Transit needs to be able to maintain its service for regional trips, and thus in many corridors, the development of streetcar service may not provide for corresponding reductions in bus service. It would be possible to operate both streetcar and bus service in all streetcar corridors, but with more service and at a higher cost than to only provide bus service. Similar to work currently being conducted as part of the Nicollet-Central Alternatives Analysis in Minneapolis, bus/streetcar integration issues would need to be examined in more detail as part of subsequent studies.
- **Pedestrian Environment:** Pedestrian conditions are less than ideal along the middle and southern portions of West 7<sup>th</sup> Street. However, as the area develops, it would be possible to improve pedestrian conditions.
- **Parking Impacts:** Depending upon how streetcar service was implemented, it could reduce parking along some corridors. However, it may also be possible to implement streetcar service and increase parking supply (for example, by converting curbside bus stops with shorter joint streetcar/bus stops that use bulb outs (since empty curb space would not be required for buses to pull out of and back into traffic)). More detailed analysis would be required as part of subsequent studies to determine how to best address these issues.

### Service to Similar Areas

Two sets of lines would serve very similar areas (see Figures 4 and 5), and as a result, ranked very similarly:

- On the east side of Saint Paul, Arcade + Maryland, Payne, and East 7<sup>th</sup>.
- In the West Side neighborhood, Robert and Wabasha.

The lines were compared in a number of ways that resulted in the selection of Payne and Robert:

- Between **Arcade + Maryland, Payne, and East 7<sup>th</sup>**, there were a number of considerations. First, Arcade + Maryland would operate along the same alignment as East 7<sup>th</sup> from downtown to Arcade Street, and between there and Maryland, largely “splits the difference” between Payne and East 7<sup>th</sup>. The area where Arcade + Maryland would provide the most unique service would be along Maryland Avenue, but as described above, potential demand in this area would be low. Finally, there appears to be greater community support for streetcar service along Payne Avenue and West 7<sup>th</sup> Street than along Arcade Street. On this basis, to avoid duplication but also to maximize coverage, Payne and East 7<sup>th</sup> were selected to provide east side service.
- Between **Robert and Wabasha**, Robert was selected due to greater ridership and development potential, and greater community support.

Figure 4 – East Side Phase 2 Lines

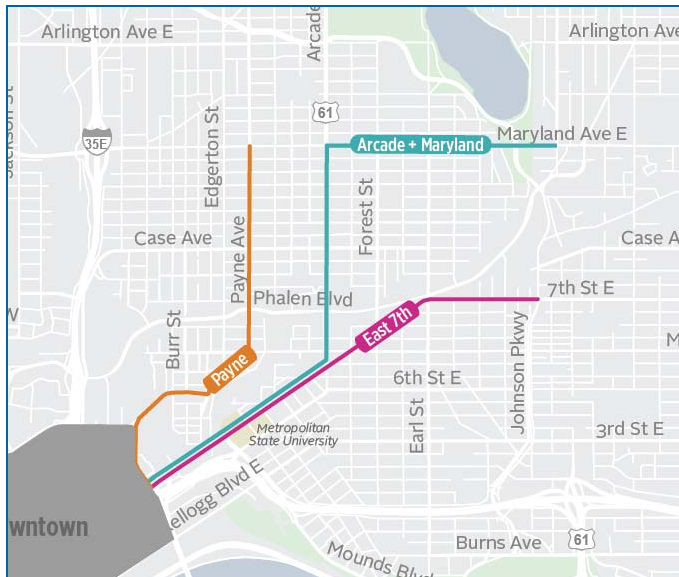


Figure 5 – West Side Phase 2 Lines



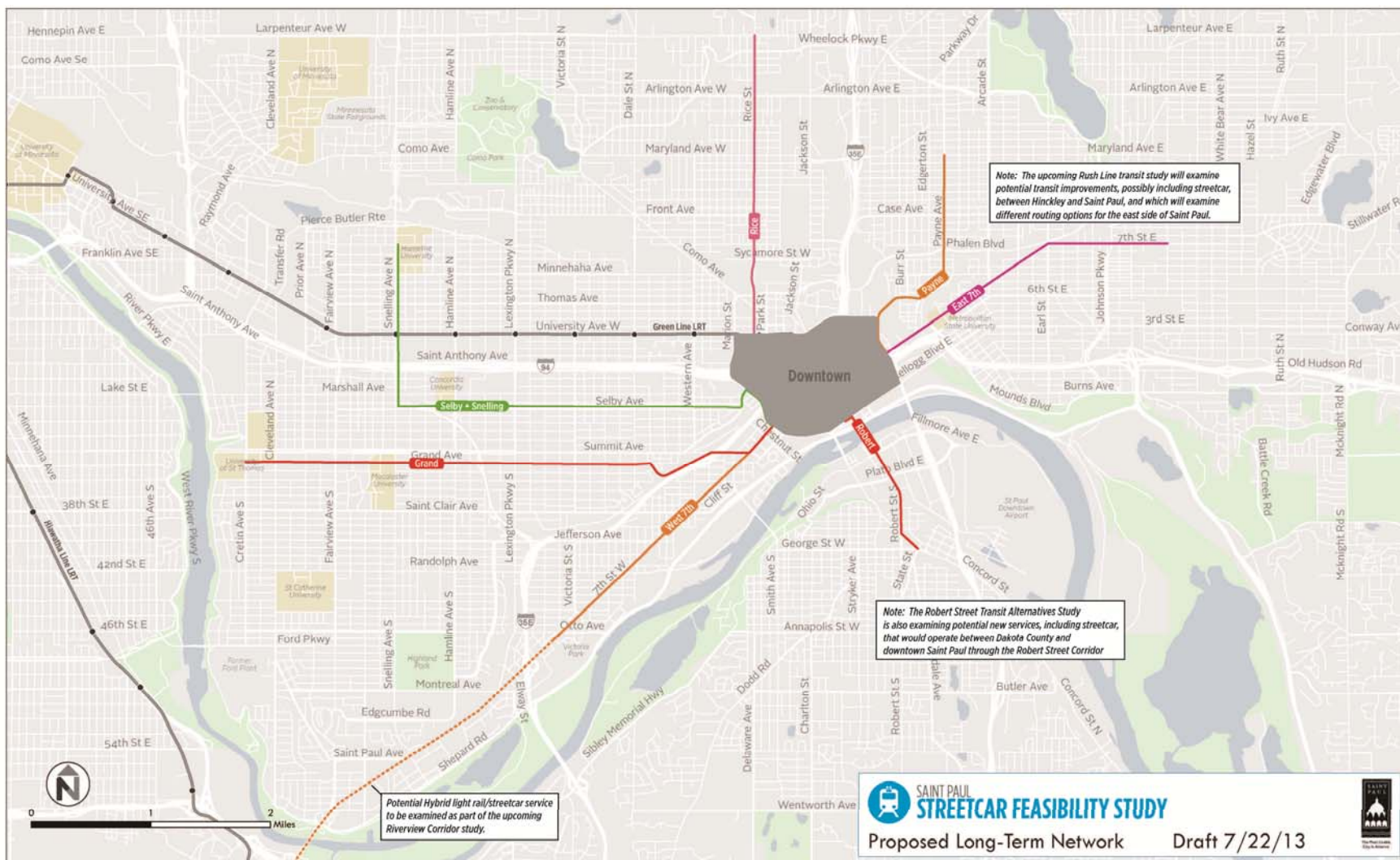
## Recommended Long-Term Network

Based on the above, the recommended long-term network would consist of seven lines. With names revised to reflect proposed origins and destinations, and as illustrated in Figure 6, these would be as follows:

<u>Line</u>	<u>Origin-Destination</u>
<b>East 7<sup>th</sup></b>	<b>Hazelwood Street - Downtown</b>
<b>Grand</b>	<b>University of Saint Thomas - Downtown</b>
<b>Payne</b>	<b>Maryland Avenue - Downtown</b>
<b>Rice</b>	<b>City Line/Larpenteur Avenue - Downtown</b>
<b>Robert</b>	<b>George Street - Downtown</b>
<b>Selby/Snelling</b>	<b>Hamline University - Downtown</b>
<b>West 7<sup>th</sup></b>	<b>Victoria Park - Downtown</b>

Most of these lines would be subsets of the Phase 2 lines, and would represent the segments that would provide strong potential for streetcar service. Exceptions are Payne and Rice, which would be the same as the Phase 2 lines, and Selby/Snelling, which would be extended to Hamline University.

Figure 6 – Proposed Long-Term Network



## Potential Demand

One of the most important reasons to implement streetcar service would be to improve transit service for Saint Paul’s residents, workers, and visitors. This section evaluates population density and employment density, which are the two market factors that are the strongest indicators of demand. Put simply, where larger numbers of people live and/or work in close proximity, transit demand is higher. The population and employment density of an area gives a strong indication of the level of transit service that it can support. These density factors are combined to produce a composite transit propensity, a single composite measure that indicates the level of transit service supported by both population and employment density.

These factors are strong indicators of transit demand; however there are other factors that also strongly impact transit demand. These other factors include the physical environment, transit service design, and the time and cost of alternatives. For example, nearly all transit riders are also pedestrians on at least one end of their trip, and thus walking environments strongly impact ridership. The attractiveness of the service provided also strongly influences transit success. Thus, there are also external factors will impact demand, many of which are evaluated in other sections of the evaluation.

## Methodology

**Population and Employment Density.** Data compiled by Nelson\Nygaard from national evidence shows the minimum population and/or employment density typically required to support transit at various service levels (see Table 1). Population and employment data by U.S. Census block for the greater Saint Paul area was compiled in GIS (population from Census 2010 and employment from Census Longitudinal Employer-Household Dynamics 2011). To illustrate the results, each block was symbolized using the categories from Table 1, resulting in the population and employment density maps shown in Figure 1 and Figure 2. Each block color indicates the level of service that each block can support; darker blocks support more service.

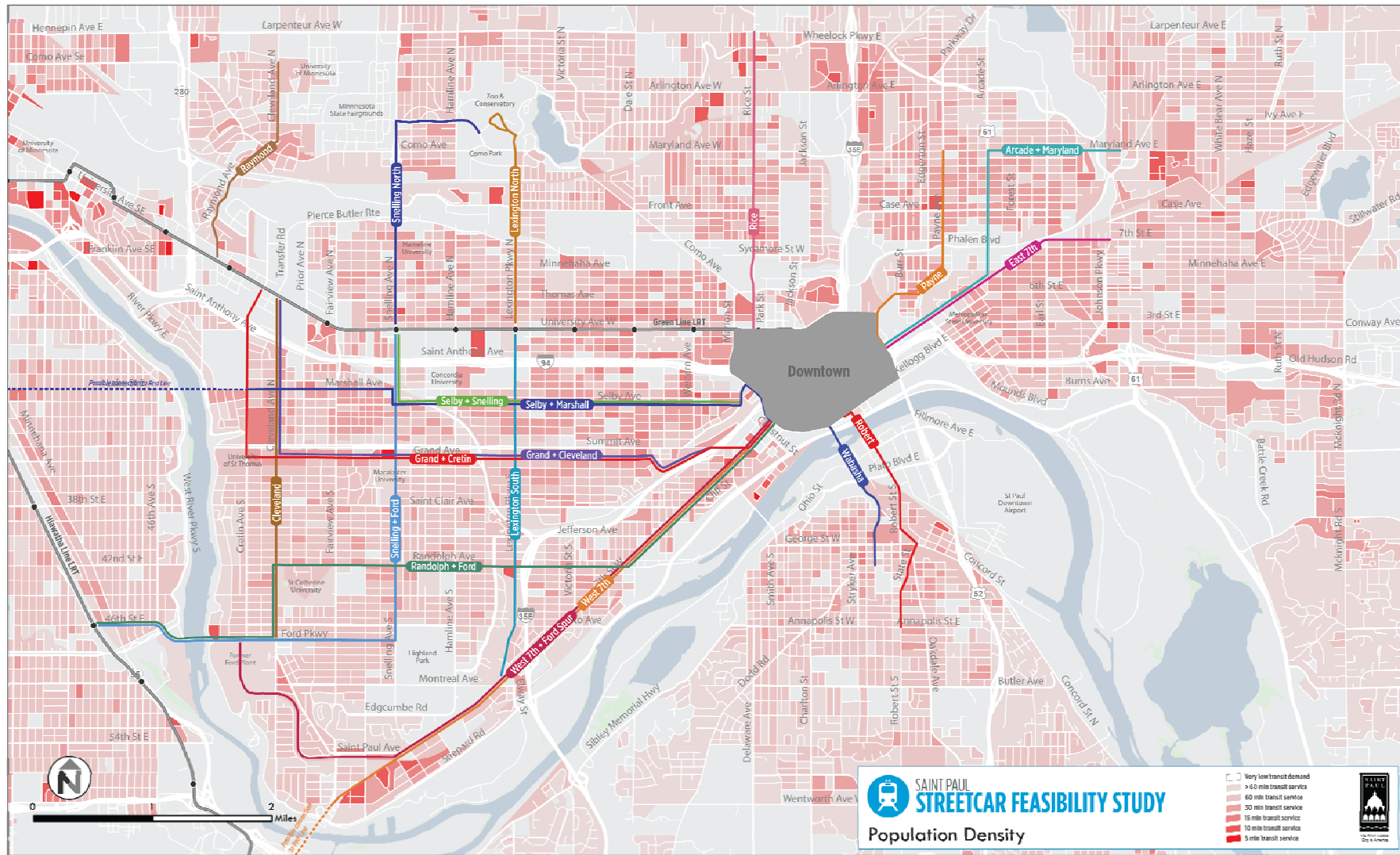
**Composite Transit Propensity.** To assess the combined effect of population and employment density, both density measures were summed to give a composite measure of transit propensity. This measure indicates the minimum density of population and/or employment required to support transit at various levels of service. The results for each census block are mapped in Figure 3. The average population and employment density within ¼-mile of each potential streetcar line was combined to determine the overall transit propensity of each line that is reported at the end of this section. Figure 4 displays the results by 100-foot segment along each line, illustrating the variation in demand along each potential streetcar line. The ¼-mile buffers around each streetcar line are shown with a dotted line for illustration.

Table 1 – Transit-Supportive Population and Employment Densities

Transit Mode/Service Level	Residents/Acre	Jobs/Acre
Flex Bus	0.5	
Community Circulator	2	
Local Bus		
60 minutes	8–16	4–8
30 minutes	16–31	8–16
15 minutes	31–47	16–24
10 minutes	47–92	24–48
≤ 5 minutes	>92	>48
Bus Rapid Transit	26–52	>13
Light Rail	31–78	>15

*Source: Nelson\Nygaard from various national research and empirical evidence*

Figure 1 – Population Density



**Figure 2 – Employment Density**

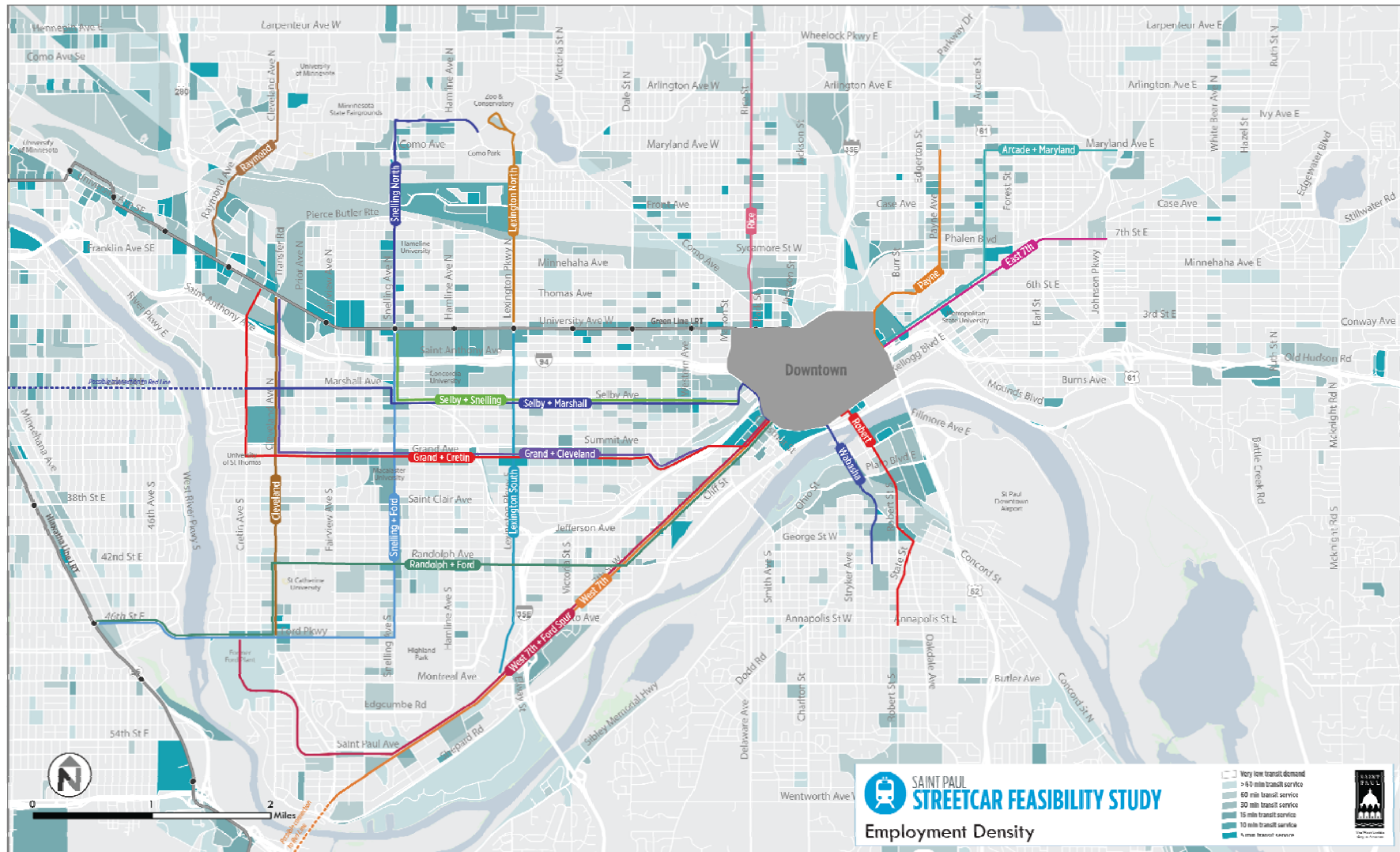


Figure 3 – Composite Transit Propensity by U.S. Census Block

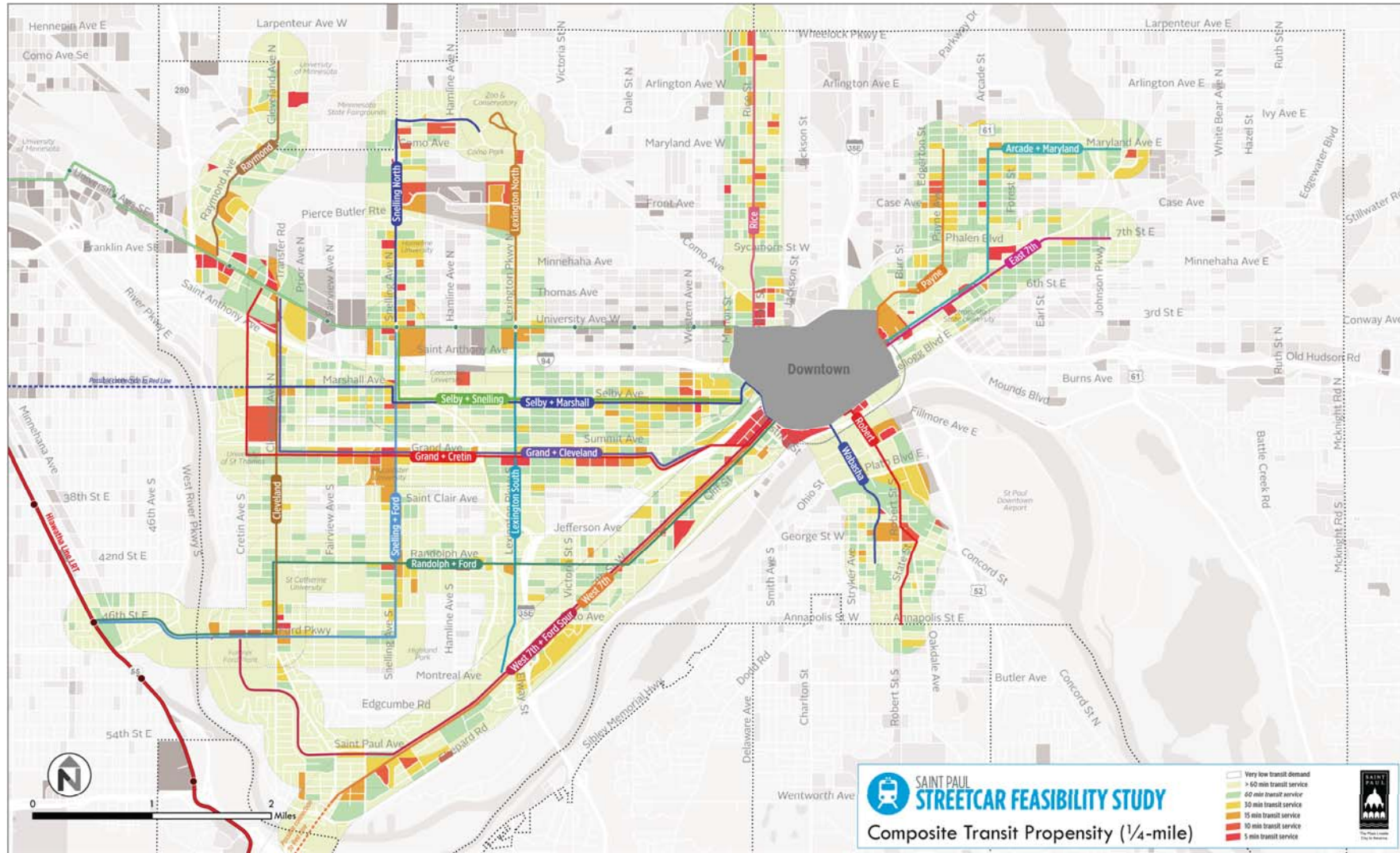
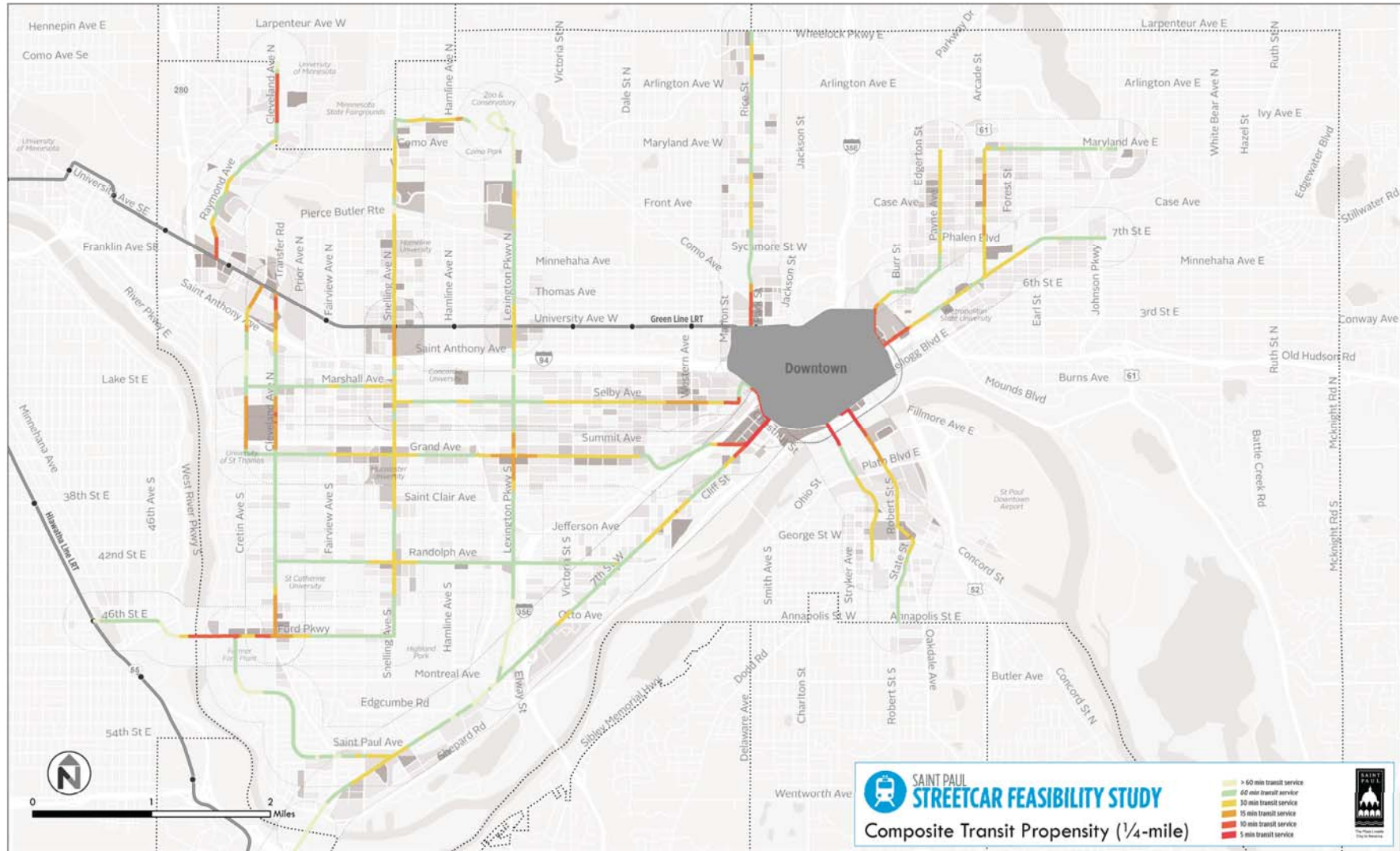


Figure 4 – Composite Transit Index by Streetcar Segment (¼-mile radius)





**Composite Transit Propensity by Line.** The population and employment density within ¼-mile of each streetcar line (which represents its ‘catchment area’) was used to determine each line’s overall transit propensity. The total population and total employment of census blocks within ¼-mile of each census block was individually summed. For census blocks that straddle the ¼-mile buffer, a portion of the block’s population and employment was included as a prorated value, based on the percentage of the block within the buffer. The total population and employment figures were divided by the acreage of the buffer to achieve a population and employment density for each corridor’s catchment area.

All values initially excluded the downtown core (see Figure 4), because of the multiple options for downtown alignment. For streetcar lines that would serve downtown, a standard quantity of population and employment density were subsequently added to the line’s population and employment density figures. This method gives lines that would serve downtown a consistent amount of population and employment density without making assumptions of downtown alignment details.

The service level supported by population and employment density was added together to achieve a composite service level. For example, a corridor’s population density that supports service every 20 minutes (3 buses per hour) was added to the corridor’s employment density that supports service every 10 minutes (6 buses per hour) to achieve an overall service level of every 7 minutes (9 buses per hour).

**Potential Streetcar Line Ratings.** To rate each corridor based on its propensity to support transit and generate ridership, the following criteria was used:

1. Any potential streetcar line with a composite transit propensity of 10 minutes or better ( $\leq 10$ ) was rated “Best.” The population and employment density along these lines suggests these corridors could already support streetcar service
2. Any potential streetcar line with a composite transit propensity between 10 minutes and 20 minutes was rated “Good.” With additional demand generated by streetcar induced development, these lines would also provide significant potential for streetcar service.
3. Any potential streetcar line with a composite transit propensity of greater than 20 minutes ( $>20$ ) was rated “Fair.” Even with additional demand due to increased development, there would be significantly less demand along these lines than along the lines rated “Best” or “Good.”

Finally, note that the ratings represent averages for the entire line. However, in many cases, shorter segments of longer lines would rank better, and even in cases where lines ranked well, strong demand would not exist along the entire line. Segment-by-segment differences were also examined and are presented in the findings.

## Findings

Based on the rating process described above, the following 11 streetcar lines are projected to have the best ridership, in alphabetical order (see also Table 3). Note that each of these potential streetcar lines would serve downtown Saint Paul.

- **Arcade + Maryland** has a combination of high employment density and moderate population density that should support significant transit service levels of 9 minutes. Downtown Saint Paul’s high employment density would have a significant positive impact on demand for service. However, demand along this line would only be high as far as the intersection of Arcade Street and Maryland Avenue, and not along Maryland Avenue.
- **East 7<sup>th</sup>** also has a combination of high employment density and moderate population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul’s high employment density would have a significant positive impact on demand for service. Demand would be strong to the vicinity of Forest Street, but low beyond that point.

**Table 3 – Demand Indicators**

Alternative	Population Density (residents/acre)	Employment Density (jobs/acre)	Composite Transit Propensity	Rating
Arcade + Maryland	12	35	9 min	✓✓ Best
Cleveland	11	8	20 min	✓ Good
East 7 <sup>th</sup>	12	42	9 min	✓✓ Best
Grand + Cleveland	12	27	9 min	✓✓ Best
Grand + Cretin	12	26	9 min	✓✓ Best
Lexington North	7	4	40 min	▲ Fair
Lexington South	9	4	30 min	▲ Fair
Payne	13	44	9 min	✓✓ Best
Randolph + Ford	10	22	12 min	✓ Good
Raymond	7	14	24 min	▲ Fair
Rice	13	37	9 min	✓✓ Best
Robert	12	44	9 min	✓✓ Best
Selby + Marshall	14	27	9 min	✓✓ Best
Selby + Snelling	14	32	9 min	✓✓ Best
Snelling + Ford	10	5	30 min	▲ Fair
Snelling North	8	8	30 min	▲ Fair
Wabasha	12	52	5 min	✓✓ Best
West 7 <sup>th</sup>	10	26	9 min	✓✓ Best
West 7 <sup>th</sup> + Ford Spur	9	22	12 min	✓ Good

- **Grand + Cleveland** has a combination of moderately high employment density and moderate population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul’s high employment density would have a significant positive impact on demand for service. Demand would be variable along the length of the line, with areas of medium to high demand interspersed with areas of low demand.
- **Grand + Cretin** would differ from Grand + Cleveland only along its outer end and has a similar combination of moderately high employment density and moderate population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul’s high employment density would have a significant positive impact on demand for service. Demand characteristics along the line would be very similar to Grand + Cretin, with no significant difference between demand along Cleveland Avenue or Cretin Avenue.

- **Payne** has a combination of high employment density and moderate population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul's high employment density would have a significant positive impact on demand for service. Demand would be strong along the outer and inner ends of the line, and low in the middle of the line.
- **Rice** has a high employment density along its inner end and moderate population density along its outer end that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul's high employment density would have a significant positive impact on demand for service. Demand would be much lower north of Como Avenue than between there and downtown.
- **Robert** has a high employment density and moderate population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul's high employment density would have a significant positive impact on demand for service. Demand would be much lower south of George Street than between there and downtown.
- **Selby + Marshall** has a combination of moderately high employment and population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul's high employment density would have a significant positive impact on demand for service. Demand would be much higher east of Dale Street than west of there.
- **Selby + Snelling** also has a combination of moderately high employment density and population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul's high employment density would have a significant positive impact on demand for service. Demand would likely be lower in the middle of the line, between Dale Street and Snelling Avenue, than it would be at the ends.
- **Wabasha** has a very high employment density and moderate population density that would likely support very significant transit service levels of 5 minutes. Downtown Saint Paul's high employment density would have a significant positive impact on demand for service. Demand would likely be high along the entire line of what would be a short line.
- **West 7th** has a combination of moderately high employment density and moderate population density that would likely support significant transit service levels of 9 minutes. Downtown Saint Paul's high employment density would have a significant positive impact on demand for service. Demand would likely be highest between downtown and Randolph Avenue.

The following three streetcar lines serve areas that may generate moderate demand for streetcar service and are projected to have moderate ridership.

- **Cleveland** has a low employment density typical of lines that do not serve downtown Saint Paul, but a moderate population density that would likely support transit service levels of 20 minutes. Demand would be significantly stronger north of Grand Avenue than south of there.
- **Randolph + Ford** has a moderate employment density and a low population density that would likely support transit service levels of 12 minutes. Downtown Saint Paul's high employment density would have a positive impact on demand for service. Demand would be highest between downtown and Randolph Avenue, lower all along Randolph Avenue, and higher again in the vicinity of the Ford plant redevelopment site.
- **West 7<sup>th</sup> + Ford Spur** has a combination of low population density and moderate employment density. However, ridership demand would be heavily concentrated at the downtown and Ford Spur ends of the line (assuming redevelopment along Ford Parkway), and low demand along most of the middle of the line.

The following five lines serve areas that would generate much lower demand:

- **Lexington North** has both low population density and low employment density, and would likely to support transit service only every 40 minutes.
- **Lexington South** also has low population density and low employment density, and would likely to support transit service at only every 30 minutes.
- **Raymond** has very low population density and low employment density, and would likely to support transit service at only every 24 minutes.

- **Snelling + Ford** has low population density and very low employment density, and is likely to support transit service to, from, and within the corridor at only every 30 minutes.
- **Snelling North** has very low population density and very low employment density, and is likely to support transit service to, from, and within the corridor at only every 30 minutes.

## Transit-Supportive Land Use

As a major transit investment, it is important to ensure that any new streetcar investment serve areas that are as transit supportive as possible. Transit supportive land uses are generally medium or high intensity developments (including major activity centers such as colleges and universities) or corridors with a mix of land uses. This criterion is carried forward from the Phase 1 screening and similarly evaluates planned land use types (by acreage) within ½-mile of each potential streetcar corridor.

### Methodology

The analysis was based on Met Council 2030 projected land use data for Saint Paul from the City of Saint Paul Comprehensive Plan, with active land uses assigned a rating of low, medium, or high credit based on their propensity to support transit (inactive land uses such as freeways and water bodies were not given any credit):

Excluded (no credit)	Low	Medium	High
<ul style="list-style-type: none"> <li>Water bodies</li> <li>Major infrastructure (freeways, ramps, and interchanges)</li> </ul>	<ul style="list-style-type: none"> <li>Established Neighborhoods</li> <li>Industrial</li> <li>Parks</li> </ul>	<ul style="list-style-type: none"> <li>Residential Corridor</li> </ul>	<ul style="list-style-type: none"> <li>Downtown</li> <li>Major Institutional</li> <li>Mixed Use Corridor</li> </ul>

The total amount of excluded, low, medium, and high land use area within ½-mile of each alternative was summed and compared to the total acreage to achieve percentages. These percentages were weighted by an increasing factor for low, medium, and high, which were set to approximate order of magnitude variation in projected density ranges from the City of Saint Paul’s Comprehensive Plan:

- Land uses in the **low** category received a score of **1.0 per acre** based on a midpoint value of 11.5 units per acre (from the Established Neighborhood land use projection).
- Land uses in the **medium** category received a score of **1.5 per acre** based on a midpoint value of 17 units per acre (from the Residential Corridor land use projection).
- Land uses in the **high** category received a score of **9.0 per acre** based on a midpoint value of 103.75 units per acre (from an average of the Downtown and Mixed Use Corridors land use projections).

The low, medium, and high values (acreage \* score) were summed for each corridor, multiplied by 100, and divided by the average score to produce an index value. Therefore, an index of 100 is average; a score below 100 indicates a corridor with a lower propensity to support transit, while a score above 100 indicates a corridor with a higher propensity to support transit. Ratings were then based on the following:

Index Score	Rating
100 or more	✓ Best
Between 90 and 100	✓ Good
90 or less	▲ Fair

Note that some portions of the ½-mile buffers extended outside of the Saint Paul city limit. These areas were excluded from the analysis because the 2030 projected land use data was available only for areas inside the City of Saint Paul. This limitation may impact the score of some alternatives, as some significant activity centers such as the University of Minnesota are just outside Saint Paul.

## Findings

The bulk of Saint Paul's total area is projected to remain as traditional neighborhoods with relatively low levels of transit-supportiveness. More transit-supportive projected land uses are found at major redevelopment sites or activity centers, throughout downtown Saint Paul, and the parcels immediately along many of Saint Paul's more significant corridors (see Figure 1). The Phase 2 alternatives typically run along many of these corridors, so the varying scores among corridors is largely due to whether the alternative serves downtown, the presence of significant redevelopment sites or activity centers along the corridor, and the presence of inactive land uses such as freeway infrastructure or bodies of water.

Seven alternatives received a score of 100 or higher. All seven of these corridors are anchored by downtown Saint Paul. These alternatives, listed in alphabetical order, are projected to serve the most transit-supportive areas:

- **Grand + Cleveland** scored very well because it would serve downtown Saint Paul, the Grand Avenue corridor, Macalester College, the University of Saint Thomas, and a part of the University Avenue corridor. Unsupportive segments of this alternative include Cleveland Avenue between Marshall Avenue and I-94, plus Grand Avenue between Dale Street and I-35E.
- **Rice** scored well because it would serve the highly transit-supportive areas of downtown Saint Paul and the large area surrounding the State House, which is categorized as major institutional. The corridor itself is lined with mixed use corridor land uses, which is highly transit-supportive.
- **Robert** scored very well because the alternative is relatively short and a large portion of the alternative would serve downtown. Also, the land uses directly along the Robert Street corridor are almost entirely all high-scoring areas, including the significant development site just south of the Mississippi River.
- **Selby + Marshall** would serve the Selby Avenue corridor, which is lined with highly transit-supportive land uses, plus downtown Saint Paul. The segment along Marshall Avenue is lined with medium scoring land uses, plus the ½-mile catchment area includes some of the high scoring land uses along Grand Avenue.
- **Selby + Snelling** scored very well, as the alternative would serve all of the transit-supportive land uses of the Selby + Marshall corridor such as downtown Saint Paul, Concordia University, and would add the transit-supportive land uses around University Avenue.
- **Wabasha** received the highest score, largely because the alternative is relatively short and a large portion would serve downtown Saint Paul. The alternative would also serve the significant development site just south of the Mississippi River.
- **West 7<sup>th</sup>** scored very well because it would serve downtown Saint Paul plus multiple significant redevelopment sites along West 7<sup>th</sup> Street. Though its score is negatively impacted because the alternative has the largest portion of inactive land uses (mostly bodies of water), the positive impact of the redevelopment sites offsets this impact and raises its score.

The following nine alternatives received scores that indicate they are projected to serve corridors with a mix of supportive and unsupportive land uses. In alphabetical order:

- **Arcade + Maryland** would serve corridors immediately lined with transit-supportive parcels, plus downtown downtown Saint Paul. However, the alternative's catchment area off the immediate corridor is largely transit-unsupportive.
- **East 7<sup>th</sup>** scored well and would serve the segment of East 7<sup>th</sup> Street with the most transit-supportive land use (west of Johnson Parkway), plus downtown Saint Paul.



- **Grand + Cretin** would serve downtown Saint Paul, Macalester College, and the University of Saint Thomas University. Unsupportive segments of this alternative include Cretin Avenue between Marshall Avenue and I-94, plus Grand Avenue between Dale Street and I-35E.
- **Payne** scored well because it is short and would serve downtown Saint Paul. The segment between Grove Street and Phalen Boulevard is unsupportive, yet the catchment area for this segment captures the transit-supportive area along East 7<sup>th</sup> Street, which is not accessible from Payne Avenue. To better reflect actual pedestrian conditions, the high scoring land uses in this particular segment were rated down to low.
- **Randolph + Ford** scored well because it would serve corridors lined with highly transit-supportive land uses (Randolph Avenue and West 7<sup>th</sup> Street), plus downtown Saint Paul, St. Catherine University, and the redevelopment site at the former Ford plant.
- **Raymond** would serve the short Raymond Avenue and Cleveland Avenue corridor from University Avenue to the city limit. Most of this area is unsupportive, though there are small areas with supportive land uses, such as near University Avenue. The Cleveland Avenue segment did not receive credit for bordering the University of Minnesota because the land use data only included areas inside the city limits.
- **Snelling + Ford** would serve the Snelling Avenue and Ford Parkway corridors, plus the Ford plant redevelopment site and Macalester College, which are all transit-supportive. However, the segments of Ford Parkway east of Cleveland Avenue and Snelling Avenue between Marshall Avenue and I-94 lowered its score.
- **Snelling North** would serve the transit-supportive area around University Avenue, as well as transit-supportive areas south of the railroad tracks (including Hamline University), though the segment north of the tracks plus the east-west segment into Como Park would serve very unsupportive land uses.
- **West 7<sup>th</sup> + Ford Spur** scored moderately well. The West 7<sup>th</sup> Street corridor is lined with transit-supportive land uses and has some significant clusters of transit-supportive redevelopments, plus the redevelopment site at the former Ford plant. However, the alternative would serve significant areas of inactive land uses (bodies of water and along freeways) in addition to the unsupportive Ford spur segment east of Cleveland Avenue.

The following alternatives received scores that indicate they are projected to predominantly serve areas with unsupportive land uses. In alphabetical order:

- **Cleveland** would directly serve the Cleveland Avenue corridor, which is less transit-supportive than other corridors. Although the alternative would serve the University of Saint Thomas, St. Catherine University, and the Ford plant redevelopment site, the collective size of high scoring land uses is quite small.
- **Lexington North** received the lowest score. The alternative would serve the Lexington Parkway corridor north of University Avenue, which is one of the few major corridors not lined with transit-supportive land uses. The segment north of the railroad tracks is entirely unsupportive.
- **Lexington South** would serve the Lexington Parkway corridor south of University Avenue, which is one of the few major corridors not lined with transit-supportive land uses. In addition, the alternative would serve no redevelopment sites or significant activity centers.



**Table 2 – Transit Supportive Land Use Assessment**

Alternative	Land Use as Percent of Total Land Within ½-mile of Alternative			Transit-Supportive Land Use Index	Rating
	Low	Med	High		
Arcade + Maryland	55%	5%	27%	93	✓ Good
Cleveland	65%	9%	22%	86	▲ Fair
East 7 <sup>th</sup>	53%	5%	29%	98	✓ Good
Grand + Cleveland	53%	7%	29%	100	✓✓ Best
Grand + Cretin	54%	6%	28%	97	✓ Good
Lexington North	74%	4%	14%	63	▲ Fair
Lexington South	71%	3%	19%	76	▲ Fair
Payne	53%	2%	29%	99	✓ Good
Randolph + Ford	53%	4%	29%	99	✓ Good
Raymond	57%	2%	26%	92	✓ Good
Rice	52%	2%	33%	108	✓✓ Best
Robert	41%	3%	41%	129	✓✓ Best
Selby + Marshall	47%	5%	33%	110	✓✓ Best
Selby + Snelling	43%	4%	39%	122	✓✓ Best
Snelling + Ford	66%	3%	26%	95	✓ Good
Snelling North	62%	4%	25%	92	✓ Good
Wabasha	39%	3%	43%	133	✓✓ Best
West 7 <sup>th</sup>	51%	2%	30%	100	✓✓ Best
West 7 <sup>th</sup> + Ford Spur	53%	3%	29%	98	✓ Good

## Development Potential

Streetcar service can help stimulate development in ways that improve urban vitality. However, for this to occur, the streetcar environment must be transit-supportive. Most of Saint Paul’s neighborhoods have expressed interest in creating mixed-use environments, which could support streetcar development. Beyond zoning and local support, there must also be land available for development, which would generally consist of vacant or underutilized parcels such as surface parking lots.




This section first documents districts and neighborhoods that have actively re-zoned for transit-supportive areas or are planning for large-scale redevelopment. The second then examines the development potential in those areas.

### Methodology

#### Desire for Future Development

The District Plans and Small-Area Plans were critical in determining the overall vision of future development in each neighborhood. Such plans outline desired changes in the built environment and whether the future neighborhoods will be or continue to be ones that are transit supportive. The District and Small Area Plans, however, are from a wide range of years, which means that some are more up-to-date than others. In order to verify the degree to which the neighborhoods have followed through with their plans, current zoning maps were considered. Traditional neighborhood (TN) zoning and other higher density areas, which allows for mixed-use clusters, are particularly indicative of areas that would accommodate streetcars. In addition, current zoning maps were used to identify neighborhoods that have rezoned in order to support redevelopment. Traditional neighborhood (TN) zoning, which allows for mixed-use clusters, is especially supportive of streetcar service.

The following rating scale was used for the initial evaluation of development potential:

Area	Rating
Redevelopment currently underway or recently completed (as this indicates that there is already development demand that could be further stimulated)	 <b>Best</b>
Expressed interest in creating mixed-use neighborhoods and/or recent rezoning to for transit-supportive land use.	 <b>Good</b>
All other areas	 <b>Fair</b>

### Development Potential

A number of factors would determine how each area could develop, one of which would be the addition of streetcar service. At this stage of planning, it is not possible to determine how much development would occur, and instead the study team estimated development potential. There are different ways to estimate potential, one of the most common of which is the maximum amount of development permitted by zoning. However, this much development never occurs, as not all parcels are built-out to their maximum potential. To reflect that, this analysis takes a more conservative approach that:

1. Identified the number of acres of undeveloped and underdeveloped properties, with undeveloped properties being those with no buildings (excluding parcels such as parks, golf courses, etc.), and underdeveloped parcels as those with low values (as described in more detail below).




2. Determined how much additional value could be achieved if the undeveloped and underdeveloped parcels were developed to the point where their values met or exceeded average values (also as described in more detail below).

To do this, the study team split each line into short segments and then used 2012 tax assessment data to identify the value per acre for each parcel. Based on 2030 projected land use, we assigned each parcel in areas other than established neighborhoods a land use designation of industrial, mixed-use, or residential corridor (areas where there would be large amounts of multi-unit housing). This allowed us to identify parcels that are not zoned to change from the existing conditions, including major parks and established neighborhoods. Parcels not zoned to change were excluded, along with parcels that have an area less than 0.01 acres (and thus have a redevelopment potential of zero). For each segment, we subsequently found all remaining parcels that were within a ¼-mile catchment area and calculated an average total (land + building) value per acre. This analysis did not include downtown development potential for any line.

Using the average value per acre previously calculated, the study team developed a “threshold value,” a value per acre, which parcels under this value would be considered under-developed or redevelopable. For mixed-use zoned properties, 2/3 of the average value per acre in the segment was considered the threshold, while for industrial and residential-zoned properties, the threshold was ½ of the average value per acre in the segment. This in effect gives more weight towards mixed-use properties as having a better chance of having redevelopment. In addition, parcels with a building value equal to zero or with a sub-land use type of “vacant” were considered undeveloped and re-developable.

We assumed that the introduction of streetcar would bring underdeveloped and undeveloped properties to a value equal to 2/3 of the maximum value per acre for all mixed-use properties, or for residential and industrial properties, to the average value of all properties. The sum of all differences between the actual value per acre and the average value per acre for all re-developable properties is considered “the potential.” This was then multiplied by acreage to reflect the differences in land size. *Note that this methodology represents a general approximation of potential redevelopment value, as it assumes that all lower value properties would develop but that higher value property would not.* However, it does provide a consistent and generally reasonable way to compare the potential between different lines as it does reflect the amount of undeveloped and underdeveloped property and differences in values in different areas.

Using that information, the redevelopment potential was rated, placing most weight on the redevelopment potential per mile, which would be an indicator of the relative return for investment:

Potential Value	Rating
> \$70 million / mile	 <b>Best</b>
\$30 to \$70 million / mile	 <b>Good</b>
< \$30 million / mile	 <b>Fair</b>

Finally, and as noted in the following sections, some qualitative adjustments were made to account for factors that the methodology did not account for—primarily to avoid double counting development that will likely occur along University Avenue due to the implementation of Green Line light rail service, but also to account for the character of some areas.

## Overall Ranking

Finally, overall ranking were developed as an average of the desire for new development and development potential. The rationale for this is that to maximize development potential, the residents of the area must desire for that to occur. Beyond this, in areas where current development potential may be low, the desire for residents to create a different future can produce meaningful changes that increase the development potential beyond what it may appear to be today. Thus, more weight was given to the desire for development when averaging out the results.

## Findings

### Current Development and Desires for Future Development

All of the neighborhoods through which the potential streetcar lines would run recognize that mixed-use clusters of development around key intersections would be desirable. However, in each neighborhood, there is also a range of how much development would be considered acceptable. The following neighborhoods currently have major redevelopment projects that are currently underway or that have been recently completed (see also Table 1 and Figure 1).

- In the **West Side**, there is major development underway along the waterfront and near Plato Boulevard. The West Side Flats, located near the Wabasha and Robert Street Bridges will have 1,330 units of housing as well as commercial space.
- Along **West 7<sup>th</sup> Street**, redevelopment of the former Schmidt's Brewery, located near Randolph Avenue and W 7<sup>th</sup> Street, to 247 residential lofts will be completed in 2013.
- The potential **Payne-Phalen** Line has major redevelopment and reuse underway on Phalen Boulevard for light industrial and commercial (in partnership with the Port Authority).
- Along **Payne Avenue**, a 71-unit affordable senior living development, the Phalen Senior Lofts, was completed in 2005 near the intersection of Payne Avenue and Phalen Boulevard.
- In the **North End**, 56 residential units and close to 6,000 square feet of commercial space will be included in the Winnipeg Apartments development on Rice Street.
- **University Avenue** is already experiencing major redevelopment as the Central Corridor Light Rail Project (Green Line) is being constructed.

In addition, the following corridors and areas were identified as key redevelopment areas, transit-oriented development areas, and have been recently been rezoned with or currently studying TN traditional neighborhood zoning.

- **Arcade and Maryland Avenues, Highland Village**, the inner sections of **East 7<sup>th</sup> Street** near Metropolitan State University, and parts of **Rice Street** have been rezoned as TN, mixed-use "traditional" neighborhood. The intersections of **Ford at Cleveland** and **Randolph at Lexington** are also zoned as TN.
- It is currently proposed that the minimum residential density along **Phalen Boulevard** be increased to at least 10 units per acre.
- There are proposed redevelopment sites along **West 7<sup>th</sup> Street** south of Randolph Avenue, near Saint Clair Avenue, and near Goodrich Avenue. TN-zoning is being considered in Highland Park on West 7<sup>th</sup> Street as part of an on-going planning update.
- Along **Rice Street**, there is proposed redevelopment between Maryland and Front, in addition to medium-density housing between Como Avenue and the State Capitol grounds.
- **Focused business areas** are envisioned for the areas at the intersections of Cleveland Avenue at Marshall Avenue, Como Avenue at Snelling Avenue, Lexington Parkway at Randolph Avenue, and in District del Sol (West End), and Phalen Village.

Finally, the following areas have adopted policies in their Small Area Plans that are less supportive for redevelopment or a major change in the built environment.

**Table 1 – Major Projects and Zoning**

Alternative	Major Projects and Compatible Zoning	Rating of Major Projects, etc.
Arcade + Maryland	<ul style="list-style-type: none"> <li>TN zoning on Arcade St and Maryland Ave corridors</li> <li>Phalen Boulevard: Beacon Bluff Redevelopment</li> </ul>	<b>Best</b>
Cleveland	<ul style="list-style-type: none"> <li>TOD district adjacent to the Raymond / University LRT station.</li> <li>TN zoning at Highland Village near Cleveland and Ford</li> </ul>	<b>Good</b>
East 7 <sup>th</sup>	<ul style="list-style-type: none"> <li>TN zoning on south side of E 7th St.</li> <li>Phalen Boulevard: Beacon Bluff Redevelopment.</li> </ul>	<b>Best</b>
Grand + Cleveland	<ul style="list-style-type: none"> <li>Macalaster-Groveland to not relax off-street parking requirements until alternative transportation is available.</li> </ul>	<b>Fair</b>
Grand + Cretin	<ul style="list-style-type: none"> <li>Macalaster-Groveland to not relax off-street parking requirements until alternative transportation is available.</li> </ul>	<b>Fair</b>
Lexington North	<ul style="list-style-type: none"> <li>Intensification intended at intersection of Lexington and University.</li> </ul>	<b>Fair</b>
Lexington South	<ul style="list-style-type: none"> <li>Intensification intended at intersection of Lexington and University.</li> <li>TN zoning at the intersection of Randolph and Lexington</li> </ul>	<b>Fair</b>
Payne	<ul style="list-style-type: none"> <li>Increase of residential densities to 10 units/acre near Payne and Phalen</li> <li>Phalen Senior Lofts (finished 2005): 71 units</li> </ul>	<b>Good</b>
Randolph + Ford	<ul style="list-style-type: none"> <li>TN zoning at the intersection of Randolph and Lexington</li> <li>Former Ford Plant redevelopment</li> <li>TN zoning at Highland Village near Cleveland and Ford</li> <li>Macalaster-Groveland to not relax off-street parking requirements until alternative transportation is available.</li> </ul>	<b>Good</b>
Raymond	<ul style="list-style-type: none"> <li>TOD development at the Raymond / University LRT station.</li> </ul>	<b>Fair</b>
Rice	<ul style="list-style-type: none"> <li>Winnipeg Apartments: 56 new units on Front Ave</li> <li>Medium residential density studied south of Como on Rice in Capitol Heights.</li> <li>TN zoning between Sycamore and Arlington</li> </ul>	<b>Best</b>
Robert	<ul style="list-style-type: none"> <li>Waterfront Development</li> <li>West Side Flats: 1,330 units at Plato Boulevard.</li> <li>District del Sol: mixed-use street level retail envisioned.</li> </ul>	<b>Best</b>
Selby + Marshall	<ul style="list-style-type: none"> <li>Small-scale mixed-use encouraged on Marshall Ave on unused lots. No major redevelopment on Marshall Ave.</li> <li>Marshall Ave to remain primarily residential.</li> <li>Summit-University to remain preserved mostly as-is with limited infill development.</li> </ul>	<b>Fair</b>
Selby + Snelling	<ul style="list-style-type: none"> <li>TOD development on University Ave near the Snelling Green Line station.</li> <li>Summit-University to remain preserved mostly as-is with some infill development.</li> </ul>	<b>Fair</b>
Snelling + Ford	<ul style="list-style-type: none"> <li>Former Ford Plant redevelopment</li> <li>TN zoning at Highland Village near Cleveland and Ford</li> <li>TN-zoning at the intersection of Randolph and Lexington</li> <li>Redevelopment on University Ave near Snelling LRT station.</li> </ul>	<b>Good</b>
Snelling North	<ul style="list-style-type: none"> <li>TOD development on University Ave near Snelling LRT station</li> </ul>	<b>Fair</b>
Wabasha	<ul style="list-style-type: none"> <li>West Side Flats, under construction, 1,330 units</li> <li>Waterfront Development</li> </ul>	<b>Best</b>
West 7 <sup>th</sup>	<ul style="list-style-type: none"> <li>Victoria Park (near Montreal Ave): brownfield cleanup and potential redevelopment</li> <li>Schmidt's Artist Lofts (under construction – 247 units) at Randolph Ave</li> <li>Key redevelopment focus: Randolph Ave east of 7th St</li> <li>Redevelopment potential also near Irvine Park ("Gateway Area") and Goodrich Ave.</li> <li>TN zoning currently being studied on the southern section of W 7th in Highland Park.</li> </ul>	<b>Best</b>
West 7 <sup>th</sup> + Ford Spur	<i>In addition to the developments listed above for W 7<sup>th</sup>:</i> <ul style="list-style-type: none"> <li>Former Ford Plant redevelopment</li> <li>TN zoning at Highland Village near Cleveland and Ford</li> </ul>	<b>Best</b>



- **Macalaster-Groveland** has proposed maintaining its off-street parking requirements until alternative transportation becomes available.
- **Marshall Avenue** will remain primary residential with only limited mixed-use clustered around Cleveland Avenue.
- **Summit-University** will remain mostly preserved as-is with only limited infill development.

### **Development Potential**

As described above, all parcels other than those in established neighborhoods were assigned a land use category of industrial, mixed-use, or residential corridor. The land use along all lines would include a mix of all three, and these land uses vary in value. In general, mixed-use development has the highest values, and is assessed between \$387,00 and \$1,721,000 per acre, compared to \$37,000 to \$965,000 for residential and \$0 to \$294,000 for industrial property.<sup>1</sup> Thus, the value of potential development is heavily influenced by the type of potential development, with corridors that would have more mixed-use zoning valued higher than those with more residential or industrial zoning (see Table 2). Values within each corridor are also influenced by local conditions and vary significantly (see Table 3).

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<sup>1</sup> These figures represent the assessed values of all properties that were included in the analysis—those that would be within ¼ mile of a potential line, excluding downtown and other excluded parcels as described in the Methodology section.

**Table 2 – Land Use Mix by Line**

Alternative	Industrial	Mixed-Use	Residential Corridor
Arcade + Maryland	15.1%	13.2%	3.2%
Cleveland	7.0%	9.5%	10.8%
East 7 <sup>th</sup>	26.8%	13.2%	2.3%
Grand + Cleveland	3.5%	11.5%	5.9%
Grand + Cretin	4.3%	10.1%	4.8%
Lexington North	3.5%	12.3%	1.2%
Lexington South	0.0%	14.6%	2.5%
Payne	23.6%	9.0%	1.6%
Randolph + Ford	0.3%	13.8%	2.6%
Raymond	14.6%	21.0%	3.9%
Rice	9.7%	12.2%	1.4%
Robert	10.4%	21.6%	2.5%
Selby + Marshall	3.6%	8.4%	7.5%
Selby + Snelling	4.0%	14.0%	4.6%
Snelling + Ford	3.5%	21.4%	3.7%
Snelling North	3.8%	11.1%	2.1%
Wabasha	0.3%	28.5%	2.6%
West 7 <sup>th</sup>	4.2%	26.5%	1.5%
West 7 <sup>th</sup> + Ford Spur	3.3%	26.6%	2.8%

**Table 3 – Average Value per Acre by Line and Land Use Type**

Alternative	Industrial	Mixed-Use	Residential	Overall Average for All Zoning
Arcade + Maryland	\$135,000	\$535,000	\$117,000	\$135,000
Cleveland	\$175,000	\$551,000	\$918,000	\$175,000
East 7 <sup>th</sup>	\$195,000	\$387,000	\$64,000	\$195,000
Grand + Cleveland	\$113,000	\$1,384,000	\$759,000	\$113,000
Grand + Cretin	\$133,000	\$1,391,000	\$701,000	\$133,000
Lexington North	\$228,000	\$956,000	\$99,000	\$228,000
Lexington South	\$0	\$1,556,000	\$240,000	\$0
Payne	\$294,000	\$408,000	\$54,000	\$294,000
Randolph + Ford	\$0	\$1,516,000	\$352,000	\$0
Raymond	\$261,000	\$822,000	\$160,000	\$261,000
Rice	\$227,000	\$670,000	\$67,000	\$227,000
Robert	\$191,000	\$880,000	\$37,000	\$191,000

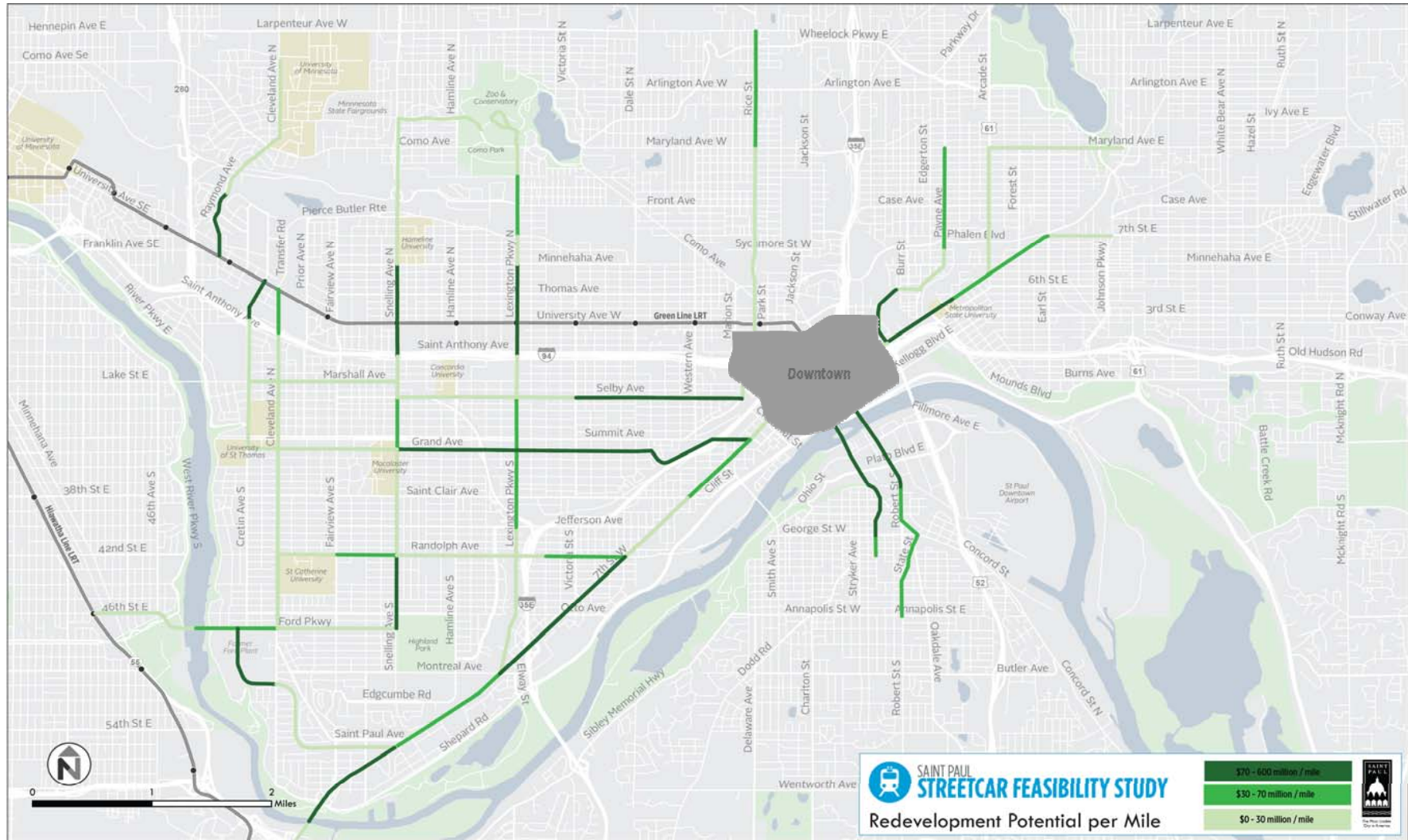


Selby + Marshall	\$222,000	\$855,000	\$965,000	\$222,000
Selby + Snelling	\$214,000	\$1,298,000	\$575,000	\$214,000
Snelling + Ford	\$175,000	\$1,721,000	\$290,000	\$175,000
Snelling North	\$116,000	\$1,272,000	\$207,000	\$116,000
Wabasha	\$2,000	\$1,144,000	\$97,000	\$2,000
West 7 <sup>th</sup>	\$73,000	\$1,174,000	\$86,000	\$73,000
West 7 <sup>th</sup> + Ford Spur	\$56,000	\$794,000	\$148,000	\$56,000

Considering both the mix of land use types, potential development value by segment would be as shown in Figure 2, and by line as summarized in Table 4. Locations with the highest potential development value include:

- Areas just outside of downtown due to a combination of higher existing properties and the availability of a significant amount of developable land. Locations with particularly high potential include along Lafayette Road west of Payne at \$311 million per mile, East 7<sup>th</sup> west of Metropolitan State University at \$160 million per mile, and Selby Avenue east of Victoria Avenue at \$93 million to \$163 million per mile.
- The former Ford Plant on Ford Parkway and the surrounding area, due in part to the size of the site and the potential for mixed-use development, where the development potential could be equivalent of \$536 million per mile.

Figure 2 – Redevelopment Potential per Mile (by segment)



**Table 4 – Development Potential**

Alternative	Total Redevelopable Acres	Redevelopable Acres/Mile	Development Potential Value/ Mile (millions)	Rating
Arcade + Maryland	189.4	39.4	\$41.6	✓ Good
Cleveland	30.9	10.7	\$14.0	▲ Fair
East 7 <sup>th</sup>	217.6	58.2	\$52.8	✓ Good
Grand + Cleveland	91.6	11.9	\$46.7	✓ Good
Grand + Cretin	121.7	15.2	\$46.9	✓ Good
Lexington North	40.5	18.7	\$26.3	▲ Fair
Lexington South	39.9	13.3	\$42.3	▲ Fair
Payne	171.4	47.2	\$61.4	✓ Good
Randolph + Ford	56.5	6.3	\$18.8	▲ Fair
Raymond	50.2	26.4	\$51.6	▲ Fair
Rice	74.9	14.3	\$20.4	✓ Good
Robert	84.9	27.4	\$109.2	✓✓ Best
Selby + Marshall	71.0	10.4	\$39.3	✓ Good
Selby + Snelling	96.9	16.0	\$70.5	✓ Good
Snelling + Ford	68.1	13.1	\$59.3	✓ Good
Snelling North	43.6	17.5	\$63.6	▲ Fair
Wabasha	84.3	29.9	\$105.3	✓✓ Best
West 7 <sup>th</sup>	160.7	17.5	\$51.0	✓ Good
West 7 <sup>th</sup> + Ford Spur	285.8	33.6	\$86.5	✓✓ Best

- **The West Side, just south of downtown across the river, where current projects are already adding over a thousand new housing units, and where there is further potential for further streetcar-related growth. The areas directly south of the river through Congress Street provide potential that range from \$181 to \$544 million per mile.**
- **South of Saint Paul Avenue on West 7<sup>th</sup>, where there are many large parcels of redevelopable land, with development value of approximately \$157 million per mile.**

Three lines would have the highest potential to increase development value:

- **Robert**, which would have the highest redevelopment potential relative to length, with a value of \$109 million per mile. The highest redevelopment potential is located across the river from downtown through George Street and then declines farther away from downtown.
- **Wabasha**, which would serve many of the same areas as Robert, and would have potential development value of \$105 million per mile. Like Robert, the highest redevelopment potential is located across the river from downtown through George Street and then declines farther away from downtown.
- **West 7<sup>th</sup> + Ford Spur** would have potential development value of \$87 million per mile, with the highest potential on West 7<sup>th</sup> Street south of downtown between Grand Avenue and Saint Clair Avenue and between Randolph Avenue and Saint Paul Avenue, and in the vicinity of the former Ford plant.

Ten lines would have a good potential for development:

- **Arcade + Maryland**, which would have potential development value of \$42 million per mile. Areas with the highest redevelopment potential are located on East 7<sup>th</sup> especially between downtown and Metropolitan State University.
- **East 7<sup>th</sup>**, which would have a potential development value of \$53 million per mile, with the highest potential on East 7<sup>th</sup> between downtown and Metropolitan State University, and decreasing from there with distance from downtown.
- **Grand + Cleveland**, which would have a potential development value of \$47 million per mile. Development potential would be highest between downtown and Snelling Avenue, where there are a large number of redevelopable parcels, and in the vicinity of University Avenue. However, between Snelling Avenue and I-94, development potential would be low.
- **Grand + Cretin**, which would have a potential development value of \$47 million per mile. Similar to Grand + Cleveland, development potential would be highest between downtown and Snelling Avenue and in the vicinity of University Avenue, and low between Snelling Avenue and I-94.
- **Payne**, which would have potential development value of \$61 million per mile, with the highest potential just outside of downtown along Lafayette Road. A second area with strong potential would be along Payne Avenue between Phalen Boulevard Maryland Avenue.
- **Rice**, which would have a theoretical potential development value of \$20 million per mile. This low value is largely because the area's current property values lag those in much of the rest of Saint Paul, and the methodology assumes increases based on the current range of property values. However, the strong character of Rice Street and the potential for higher value mixed-use development indicates that the development potential could be significantly higher.
- **Selby + Marshall**, which would have a potential development value of \$39 million per mile, which the highest potential between downtown and Victoria Street. Development potential west of Victoria Street would be relatively low.
- **Selby + Snelling**, which would have a potential development value of \$75 million per mile. Although this figure is much higher than for Selby + Marshall, much of the increase would be due to potential development between I-94 and University Avenue, and it is questionable whether a Selby+ Snelling streetcar line would spur development beyond that which will occur due to new Green Line light rail service on University Avenue. Thus, the actual potential is more likely much closer to the potential for a Selby + Marshall line, with the strongest potential for development between downtown and Victoria Street.
- **Snelling + Ford** which would have a potential development value of \$59 million per mile, with the highest potential between University Avenue and I-94, between Randolph Avenue and Ford Parkway, and along Ford Parkway in the vicinity of the former Ford plant. However, development potential would be low in other areas.
- **West 7<sup>th</sup>**, which would have a potential development value of \$51 million per mile, with strong potential south of downtown between Grand Avenue and Saint Clair Avenue and between Randolph Avenue and the southern end of the line.

Six lines have low redevelopment potential per acre:

- **Cleveland**, which would have a potential development value of \$14 million per mile. Value would be low along the entire line except for the short segment between University Avenue and I-94.
- **Lexington North**, which would have a potential development value of \$26 million per mile, with the highest potential close to University Avenue and north and south of Forest Avenue. generally has low potential, except for near University Avenue. The area near Front Avenue and
- **Lexington South**, which would theoretically have a development value of \$42 million per mile. However, much of that value would be between University Avenue and I-94, and it is questionable whether a Lexington Avenue streetcar line would spur development in that area beyond that which will occur due to new Green Line light rail on University Avenue. A second area with good potential would be between Selby Avenue and Randolph Avenue.
- **Randolph + Ford**, which would have a potential development value of \$19 million per mile. The low overall potential would be because strong potential in some areas (the vicinity of the former Ford plant, between Fairview Avenue and Snelling Avenue, and between I-35E and West 7<sup>th</sup> Street would offset by very low development potential in other areas.
- **Raymond**, which would theoretically have potential development value of \$52 million per mile. However, similar to Lexington South, most of the potential is in the vicinity of University Avenue and it is questionable whether a Lexington Avenue streetcar line would spur development beyond that which will occur due to new Green Line light rail on University Avenue.
- **Snelling North**, which would theoretically have a development potential of \$64 million per mile. However, most of the potential would be close to University Avenue, and it is questionable whether a Snelling North streetcar line would spur development beyond that which will occur due to new Green Line light rail service on University Avenue.

## Overall Findings








In terms of both the desire for development and the potential value of development, six lines would rate as best (see Table 5):

- Arcade + Maryland
- East 7<sup>th</sup>
- Robert
- Wabasha
- West 7<sup>th</sup>
- West 7<sup>th</sup> + Ford Spur

Nine lines would rate as Good:

- Cleveland
- Grand + Cleveland
- Grand + Cretin
- Payne
- Randolph + Ford
- Rice
- Selby + Marshall
- Selby + Snelling
- Snelling + Ford

**Table 5 – Final Ratings**

Alternative	Desire for Development	Redevelopment Potential	Total Rating
Arcade + Maryland	Best	Good	 <b>Best</b>
Cleveland	Good	Fair	 <b>Good</b>
East 7 <sup>th</sup>	Best	Good	 <b>Best</b>
Grand + Cleveland	Fair	Good	 <b>Good</b>
Grand + Cretin	Fair	Good	 <b>Good</b>
Lexington North	Fair	Fair	 <b>Fair</b>
Lexington South	Fair	Fair	 <b>Fair</b>
Payne	Good	Good	 <b>Good</b>
Randolph + Ford	Good	Fair	 <b>Good</b>
Raymond	Fair	Fair	 <b>Fair</b>
Rice	Best	Good	 <b>Good</b>
Robert	Best	Best	 <b>Best</b>
Selby + Marshall	Fair	Good	 <b>Good</b>
Selby + Snelling	Fair	Good	 <b>Good</b>
Snelling + Ford	Good	Good	 <b>Good</b>
Snelling North	Fair	Fair	 <b>Fair</b>
Wabasha	Best	Best	 <b>Best</b>
West 7 <sup>th</sup>	Best	Good	 <b>Best</b>
West 7 <sup>th</sup> + Ford Spur	Best	Best	 <b>Best</b>

**Four lines would rate as Fair:**

- Lexington North
- Lexington South
- Raymond
- Snelling North

## Special Use Generators

Streetcar lines that serve high-intensity uses along their entire alignment are much stronger than those that do not. High-intensity transit use generators can also help maintain transit demand throughout the day. This section evaluates the number and relative intensity of uses along each potential line.

### Methodology

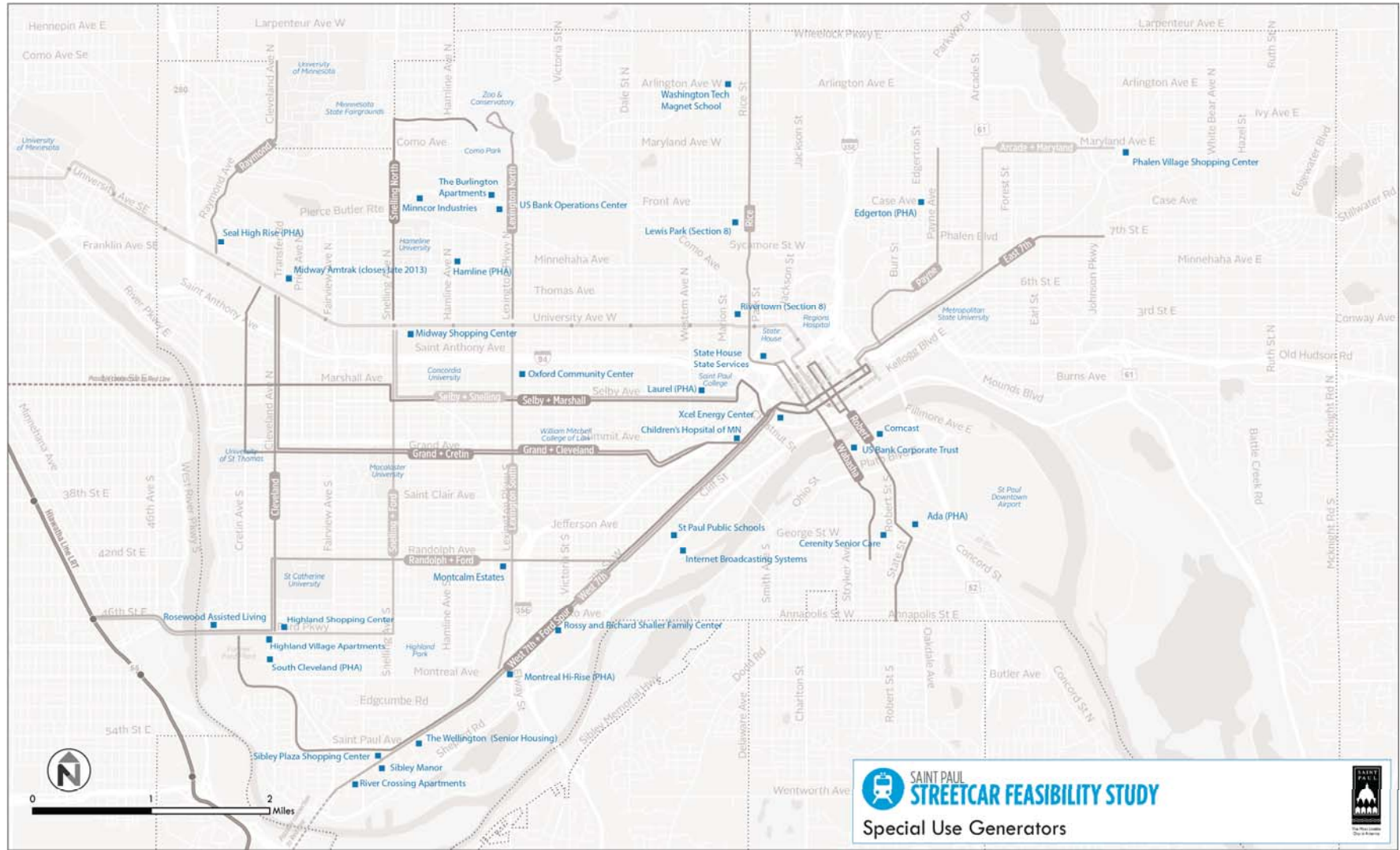
The evaluation of special use generators utilized both a quantitative and qualitative assessment of special use generators along the length of each line. The quantitative analysis measured the number of students and visitors within a half-mile of each line. The study team conducted research to determine enrollment at nearby colleges and universities, and the number of annual visitors to Como Park, Como Park Zoo & Conservatory, and the Saint Paul-Minneapolis International Airport. The Como Park Zoo & Conservatory is one of the most popular attractions in the city of Saint Paul, and is open year-round to visitors. The entire park has four million annual visitors, with the Zoo & Conservatory accounting for about half of those. The airport served nearly 23,700 originating revenue passengers each day on average in 2012, and is ranked in the top 20 of all North American airports for number of passengers served. From this research, total activity, measured as student enrollment plus daily park or airport visitors, rated as follows:

Student/Visitor Activity	Rating
> 20,000	Best
5,000 – 20,000	Good
< 5,000	Fair

Several resources, such as Google Maps, were used for the qualitative assessment of special use generators within a half-mile of each alternative. Google Maps presented information on education facilities, shopping centers, and employment centers. In addition, the Saint Paul Housing Authority provided locations of high-rise public housing. The quantity of transit generators and intensity of use, not including Como Park visitors, university or college students, or airport visitors, determined the qualitative rating for each alternative.

The final rating is the average of the two qualitative and quantitative ratings rounded upwards. As an example, for an alternative that receives one good and one fair rating, the final rating is good.

Figure 1 – Special Use Generators





**Table 1 – Special Use Generators**

Alternative	Student/Visitor Activity	Activity Rating	Special Use Generators	Special Use Generators Rating	Rating
Arcade + Maryland	5,300	Good	<ul style="list-style-type: none"> <li>Phalen Village Shopping Center</li> <li>Metropolitan State University</li> </ul>	Fair	✓ Good
Cleveland	15,400	Good	<ul style="list-style-type: none"> <li>Highland Shopping Center</li> <li>Highland Village Apartments</li> <li>South Cleveland (StPHA)</li> <li>Saint Catherine University</li> <li>University of Saint Thomas</li> </ul>	Good	✓ Good
East 7 <sup>th</sup>	5,300	Good	<ul style="list-style-type: none"> <li>Metropolitan State University</li> </ul>	Fair	✓ Good
Grand + Cleveland	13,300	Good	<ul style="list-style-type: none"> <li>Children's Hospital and Clinic of MN</li> <li>Xcel Energy Center</li> <li>William Mitchell Law School</li> <li>University of Saint Thomas</li> <li>Macalester College</li> </ul>	Best	✓✓ Best
Grand + Cretin	13,300	Good	<ul style="list-style-type: none"> <li>Children's Hospital and Clinic of MN</li> <li>Xcel Energy Center</li> <li>William Mitchell Law School</li> <li>University of Saint Thomas</li> <li>Macalaster College</li> </ul>	Best	✓✓ Best
Lexington North	11,000	Good	<ul style="list-style-type: none"> <li>US Bank Operation Center</li> <li>The Burlington Luxury Apartments</li> <li>Zoo &amp; Conservatory</li> <li>Como Park</li> </ul>	Fair	✓ Good
Lexington South	0	Fair	<ul style="list-style-type: none"> <li>Montcalm Estates</li> <li>Montreal Hi-Rise (Section 8)</li> <li>Oxford Community Center</li> </ul>	Fair	▲ Fair
Payne	5,300	Good	<ul style="list-style-type: none"> <li>Edgerton (StPHA)</li> <li>Metropolitan State University</li> </ul>	Fair	✓ Good
Randolph + Ford	5,100	Good	<ul style="list-style-type: none"> <li>Rosewood Assisted Living</li> <li>Highland Village Apartments</li> <li>Highland Shopping Center</li> <li>South Cleveland (StPHA)</li> <li>Montcalm Estates</li> <li>St Paul Public Schools Administration Building</li> <li>Internet Broadcasting Systems</li> <li>Children's Hospital and Clinic of MN</li> <li>Xcel Energy Center</li> <li>Saint Catherine University</li> </ul>	Best	✓✓ Best
Raymond	26,300	Best	<ul style="list-style-type: none"> <li>Seal High-Rise (StPHA)</li> <li>UMn Saint Paul campus</li> </ul>	Fair	✓ Good
Rice	0	Fair	<ul style="list-style-type: none"> <li>Washington Technology Magnet School</li> <li>Lewis Park Housing (Section 8)</li> <li>Rivertown (Section 8)</li> <li>State House / Government</li> </ul>	Good	✓ Good
Robert	0	Fair	<ul style="list-style-type: none"> <li>Comcast</li> </ul>	Fair	▲ Fair

			<ul style="list-style-type: none"> <li>• US Bank Corporate Trust</li> <li>• Cerenity Senior Care</li> <li>• Ada (StPHA)</li> </ul>		
Selby + Marshall	24,000	Best	<ul style="list-style-type: none"> <li>• Xcel Energy Center</li> <li>• Laurel Hi-Rise (StPHA)</li> <li>• Oxford Community Center</li> <li>• William Mitchell Law School</li> <li>• Concordia University</li> <li>• Saint Paul College</li> <li>• University of Saint Thomas</li> </ul>	Good	
Selby + Snelling	13,700	Good	<ul style="list-style-type: none"> <li>• Xcel Energy Center</li> <li>• Laurel Hi-Rise (StPHA)</li> <li>• Oxford Community Center</li> <li>• Midway Shopping Center</li> <li>• William Mitchell Law School</li> <li>• Concordia University</li> <li>• Saint Paul College</li> </ul>	Best	
Snelling + Ford	10,100	Good	<ul style="list-style-type: none"> <li>• Midway Shopping Center</li> <li>• Highland Village Apartments</li> <li>• Highland Shopping Center</li> <li>• Rosewood Assisted Living</li> <li>• Concordia University</li> <li>• Macalester College</li> <li>• Saint Catherine University</li> </ul>	Good	
Snelling North	15,900	Good	<ul style="list-style-type: none"> <li>• Minnesota State Fairgrounds</li> <li>• Minncor Industries</li> <li>• Como Park</li> <li>• Zoo &amp; Conservatory</li> <li>• Hamline University</li> </ul>	Fair	
Wabasha	0	Fair	<ul style="list-style-type: none"> <li>• Comcast</li> <li>• US Bank Corporate Trust</li> <li>• Cerenity Senior Care</li> <li>• Ada (StPHA)</li> </ul>	Fair	
West 7 <sup>th</sup>	23,700	Best	<ul style="list-style-type: none"> <li>• Xcel Energy Center</li> <li>• Children's Hospital and Clinics of MN</li> <li>• St Paul Public Schools Administration Building</li> <li>• Internet Broadcasting Systems</li> <li>• Rossy and Richard Shaller Senior Center</li> <li>• Montreal Hi-Rise (StPHA)</li> <li>• Wellington Senior Housing</li> <li>• Sibley Plaza Shopping</li> <li>• Sibley Manor, River Crossing Apartments</li> <li>• Saint Paul-Minneapolis International Airport</li> </ul>	Best	
West 7 <sup>th</sup> + Ford Spur	5,100	Good	<p>In addition to all listed under W 7<sup>th</sup>:</p> <ul style="list-style-type: none"> <li>• Highland Village Apartments</li> <li>• Rosewood Assisted Living</li> <li>• South Cleveland (StPHA)</li> <li>• Saint Catherine University</li> </ul>	Best	

## Findings

The strongest lines would be those that serve a variety of strong special use generators (see Figure 1 and Table 1) along the entire length. Those that rated as best were:

- **Grand + Cleveland** and **Grand + Cretin** would serve significant amounts of student activity from the William Mitchell College of Law, Macalester College, and the University of Saint Thomas. These alternatives would also serve relatively high-intensity special use generators, including the Xcel Energy Center and Children's Hospital & Clinic of MN.
- **Randolph + Ford** would serve many transit generators with a mix of intensities, including multiple employment and residential centers, shopping centers, and special event venues; thus, this received a rating of best. Randolph + Ford also serves Saint Catherine University, which has an enrollment of about 5,100 students. Redevelopment of the former Ford plant could also provide an additional strong intermediate transit generator.
- **Selby + Marshall** would serve a community center, low-income housing, and the Xcel Energy Center, receiving a rating of good. Significant student activity at Saint Paul College, the William Mitchell College of Law, Concordia University, and the University of Saint Thomas, reaching over 24,000 students, help improve this alternative's rating to best.
- **Selby + Snelling** would serve William Mitchell College of Law, Concordia University, and Saint Paul College, which collectively have around 13,700 students enrolled. Special use generators along Selby + Snelling include a shopping center, a community center, low-income housing, and the Xcel Energy Center.
- **West 7<sup>th</sup>** would serve no student activity but would serve a significant number of passengers generated by the airport. Additionally, there are many high intensity special use generators along West 7<sup>th</sup>'s alignment, including the Xcel Energy Center, Children's Hospital and Clinics of MN, employment and residential centers, and shopping centers, which rate best.
- **West 7<sup>th</sup> + Ford Spur** would serve even more high intensity special use generators than West 7<sup>th</sup>, including additional residential complexes. West 7<sup>th</sup> + Ford Spur serves Saint Catherine University at its western end. Redevelopment of the former Ford plant could also provide an additional strong transit generator at this alternative's western terminal.

Nine lines would serve a mix of fair to very strong special use generators along the line but less total activity than the seven lines rated as best:

- **Arcade + Maryland** would serve Metropolitan State University but only one other special use generator, Phalen Village Shopping Center.
- **Cleveland** would serve Saint Catherine University and the University of Saint Thomas, which collectively have an enrollment of around 15,400 students. Cleveland also serves three other low-to moderate-intensity transit use generators, including a shopping center and two residential complexes. Redevelopment of the former Ford plant could provide a strong transit generator at Cleveland's terminal.
- **East 7<sup>th</sup>** would serve Metropolitan State University but no other special use generators.
- **Lexington North** would serve the high activity area of Como Park Zoo & Conservatory. Other special use generators along Lexington North have low intensity.
- **Payne** would serve Metropolitan State University and only one low-intensity special use generator, the Edgerton Hi-Rise apartment complex.
- **Raymond** would have very strong student activity from the University of Minnesota. Raymond is a somewhat weak alignment otherwise, with only one other low-intensity special use generator (Seal High Rise).
- **Rice** would serve no student activity, but the special use generators along Rice Street receive a rating of good and include the state government area.
- **Snelling + Ford** would serve various low to moderate intensity developments, including two shopping centers, a park, and an assisted living, though few are strong enough to generate

consistent transit use (redevelopment of the former Ford plant could provide a strong intermediate transit generator).

- **Snelling North** would serve Como Park and the Zoo & Conservatory, which receive close to 11,000 visitors per day. This line would also serve Hamline University and the state fairgrounds.

Three lines would have few special use generators:

- **Lexington South** would serve three mostly residential special use generators that are low intensity and no student or visitor activity.
- **Robert** and **Wabasha** are the same. Neither alternative would serve any student or visitor activity. Special use generators along these two lines are a mix of intensities but none are particularly high.

## Transit Speed and Reliability




Reliable and reasonable travel times play an important role in maintaining a competitive level of service to attract transit users. Similar to buses, streetcar service would operate in mixed traffic, which would make it susceptible to slowdowns from traffic congestion. This section evaluates the effects automobile traffic may have on reliable streetcar operation.

### Methodology

To conduct the Phase 2 transit speed and reliability evaluation, average automobile traffic speeds for the length of each alternative were calculated using real-time traffic data from Google Maps obtained during the afternoon peak and midday. Google Maps provides point-to-point travel times that take into consideration delays due to congestion and traffic signals. The projected travel time for most corridors is supplemented by real-time data from GPS-enabled devices (such as cellular phones) traveling on the road at certain points in time to improve the accuracy of the results (some estimates did not include this supplemental real-time data and were noted in the table).

Using the average automobile travel times, the average streetcar travel times were subsequently calculated with the assumption that streetcar service would stop every 1/5 mile for 20 seconds at each station, and that the vehicle must accelerate and decelerate between stations. Using the operating statistics for a standard streetcar or light rail vehicle aided in finding the time and distance required for the vehicle to accelerate and decelerate to the average speed along each alignment.

The results are estimates, though the calculations still indicate the general changes in traffic congestion patterns along each alternative and their consequences on streetcar travel times. Two measures, the change in speed from midday to the PM peak and a reliability index, were used to develop the initial overall rating for each alternative. Based on the percent change in travel time from the midday to PM peak, the reliability index helps understand how a transit user's trip may be affected by congestion. An index of 100 indicates that that alternative has the least amount of percent change in travel time among all alternatives considered, while a rating of zero indicates that that alternative has the greatest amount of change. The ratings were then adjusted based on average speed. Alternatives with a speed above 11 miles per hour (mph) during both the midday and at the PM peak were rated up one level (such as from 'Fair' to 'Good'), whereas alternatives with a speed below 9 mph throughout the day were rated down one level.

Change in Speed	Reliability Index	Rating
≤ 0.7 mph	76 - 100	 <b>Best</b>
0.7 - 2.0 mph	26 - 75	 <b>Good</b>
> 2.0 mph	0 - 25	 <b>Fair</b>

### Findings

The average speed of a streetcar along the alternatives considered ranged from 9.3 to 13.5 mph during the midday and from 8.3 to 11.2 during the PM peak. Overall, traffic in the city of Saint Paul would not cause significant delays on 17 of the 19 alternatives considered (see Table 1). However, as would be expected, nearly all alternatives would experience some minor delays within downtown, however. Traffic congestion along Selby + Marshall, Selby + Snelling, and Snelling North during the PM peak was highest relative to

**Table 1 – Transit Speed and Reliability Assessment**

Alternative	Estimated Average Streetcar Speed (mph)		Change in mph	Reliability Index	Rating
	Midday	PM Peak			
Arcade + Maryland	9.5	9.5	0.0	100	✓✓ Best
Cleveland	11.6	10.3	1.3	57	✓ Good
East 7 <sup>th</sup>	9.3*	9.1	0.2	94	✓✓ Best
Grand + Cleveland	9.9	9.0	0.8	68	✓ Good
Grand + Cretin	9.4	9.0	0.4	84	✓✓ Best
Lexington North	10.9	10.8	0.1	97	✓✓ Best
Lexington South	11.0	9.1	1.8	30	✓ Good
Payne	9.5	8.6	0.9	64	✓ Good
Raymond	12.2	10.8	1.4	57	✓ Good
Randolph + Ford	10.2	9.6	0.6	78	✓✓ Best
Rice	9.8	8.8	0.9	64	✓ Good
Robert	11.8*	11.2	0.7	80	✓✓ Best
Selby + Marshall	10.6*	8.3	2.4	0	▲ Fair
Selby + Snelling	10.6*	8.3	2.3	2	▲ Fair
Snelling + Ford	10.8	9.5	1.3	53	✓ Good
Snelling North	13.5	11.1*	2.4	25	✓ Good
Wabasha	11.5*	9.5	2.0	28	✓ Good
West 7 <sup>th</sup>	12.3	11.1	1.2	63	✓✓ Best
West 7 <sup>th</sup> + Ford Spur	10.2	9.2	1.0	61	✓ Good

\* Estimate did not include supplemental real-time traffic information.

the other alternatives, but Snelling North would still have an average speed above 11 mph throughout the day. Therefore, only the two alternatives that received a fair rating and have the greatest risk for delay in streetcar operation were those that would operate along Selby Avenue (**Selby + Marshall, Selby + Snelling**). The alternatives with the least amount of delay due to traffic congestion, and that were rated best, were:

- Arcade + Maryland
- East 7<sup>th</sup>
- Grand + Cretin

- Lexington North
- Randolph + Ford
- Robert

**West 7<sup>th</sup>**, though rated good on congestion, and would have a high speed throughout the day, and thus also received a rating of best. The discussion below provides more detail on the traffic congestion experienced by all alternatives in the midday and PM peak.

Six potential lines, though some slowdowns would occur, would operate most consistently throughout the day (with variations in average speeds between the midday and PM peak of 0.7 miles per hour or less) and would be the most reliable (index equals 76 or higher) and received a rating of best:

- **Arcade + Maryland** would experience some congestion during the PM peak on Arcade Street (northbound) between Case Avenue and Maryland Avenue. Some congestion occurs eastbound between Arcade and North Earl Street on Maryland Avenue.
- **East 7<sup>th</sup>** has some congestion that occurs southwest of Payne Avenue and east of Earl Street.
- **Grand + Cretin** has moderate congestion east of Ayd Mill Road westbound and at other major intersections during the PM peak. Cretin Avenue experiences some moderate congestion leading to the I- 94 entrance in both directions, as well as southbound between Marshall Avenue and Summit Avenue.
- **Lexington North** experiences some minor northbound congestion during the peak hour.
- **Randolph + Ford** experiences an increase in eastbound traffic during the PM peak between Snelling Avenue and downtown, and westbound along most of its alignment.
- **Robert** experiences some congestion south of Cesar Chavez Street.

Ten potential lines would have moderate changes in speeds between the midday and PM peak (between 0.7 and 2.0 miles per hour), yet would still be relatively reliable (index equals 26 to 75):

- **Cleveland** experiences moderate traffic throughout the day along its entire length.
- **Grand + Cleveland** has some traffic congestion in downtown during the PM peak, and all-day on Cleveland Avenue. There is moderate congestion east of Ayd Mill Road headed westbound and at the major intersections during the peak.
- **Lexington South** experiences an increase in congestion from midday to PM peak northbound between Ayd Mill Road and Interstate 94.
- **Payne** becomes moderately congested during peak hours north of Phalen Boulevard headed northbound.
- **Raymond** experiences some traffic congestion between Como Avenue and Energy Park Drive.
- **Rice** experiences some congestion south of Pennsylvania Avenue near Bethesda Hospital and the State Capitol and at key intersections.
- **Snelling + Ford** experiences some heavy congestion near the I- 94 southbound exit. In addition, Ford Parkway has an increase in congestion in both directions during the PM peak.
- **Wabasha** experiences traffic congestion circulating in downtown; however, its alignment on the Wabasha Bridge has little change in traffic between midday and peak.
- **West 7<sup>th</sup> and West 7<sup>th</sup> + Ford Spur** experience moderate to heavy traffic on certain days in the peak period heading southwest between downtown and Snelling Avenue on West 7<sup>th</sup> Street. Between Snelling Avenue and Shepard Road, congestion still occurs but is more moderate. Real-time traffic data from Google Maps shows no, or only very slight, slowdowns south of Shepard Road on Highway 5 around the airport. Though traffic is heavy along portions of West 7<sup>th</sup> during peak periods, travel times do not decrease significantly. Some traffic delay heading towards downtown between South Davern Street and I- 35E also occurs.

The following lines would experience the greatest changes in speed between the midday and PM peak (greater than 2.0 miles per hour) and would be the least reliable (index equals 25 or less):

- **Selby + Marshall** has heavy westbound traffic congestion during the PM peak on Marshall Avenue from Snelling Avenue and Aldine Street. In addition, both Marshall and Selby Avenues experience an increase in westbound traffic congestion for most of the alignment.
- **Selby + Snelling** experiences an increase in traffic congestion on Selby Avenue headed westbound for most of the avenue. In addition, there is some heavy congestion near the I- 94 southbound exit on Snelling Avenue.
- **Snelling North** experiences northbound congestion throughout the day between University Avenue and West Thomas Avenue.



## Pedestrian Environment

The physical environment where transit operates strongly impacts transit demand, since transit riders are usually also pedestrians at one end of their trip. Thus, the walking environment along and around potential streetcar corridors is an important factor in the success of the service. Generally, transit riders will walk one-quarter of a mile to access typical bus transit and up to one-half of a mile to access rail transit. However, in comfortable pedestrian environments, many transit riders will walk longer distances, while in uncomfortable environments, many will not walk that far. The Phase 2 pedestrian environment evaluation criterion considers the pedestrian environment along each streetcar alternative.

### Methodology

The evaluation considers the pedestrian environment along each streetcar alternative using three quantitative assessments plus one qualitative assessment:

- A **Walkscore.com** walkscore, which measures the closeness of a variety of services such as restaurants and bars, grocery stores, outdoor places, schools, and coffee shops. The score also incorporates the closeness of alternative transit options and the bicycle environment (topography and bicycle lane network). Walkscores were calculated approximately every ¼-mile along each alternative and averaged to get a score for the entire alternative. The score is reported on a scale from 0 to 100 (100 is best).
- A measure of **sidewalk density**, which measures the number of sidewalks within a ½-mile radius of each alternative. The existence of more sidewalks improves the walkability of the environment by improving safety and increasing the walking path options for pedestrians. GIS software was used to compute the total linear feet of sidewalk within ½-mile of each alternative; the total was then divided by the acreage in each catchment area to normalize for alternative length. The scores were indexed to a scale of 0 to 100, where 100 was the highest scoring alternative.
- A measure of **street width**, which measures the average width of streets within a ½-mile radius of each alternative. Narrower streets are generally better for pedestrians because they are easier to cross. GIS software was used to compute the total acreage of streets within the ½-mile catchment area; the total was then divided by the total linear feet of street within the same catchment area to result in an average street width (in feet) for the streets along each alternative. The scores were indexed to a scale of 0 to 100, where 100 was the highest scoring alternative (indicating the most narrow streets).
- A **qualitative assessment of pedestrian environment** along each alternative. This evaluation qualitatively measured the pedestrian environment along each alternative to capture conditions not captured in the quantitative results, such as the presence of pedestrian scale features, pedestrian activity levels, pedestrian scale land uses, and pedestrian safety concerns. Google street view and aerial images were used to assess the alternatives segment by segment. An overall qualitative assessment of each segment and for the alternative as a whole was made on a Fair – Good – Best scale.

The scores from the three quantitative assessments were averaged and then indexed to the highest scoring alternative to provide an overall pedestrian environment score. This score was then used as the basis for the ratings, classified as shown below:

Overall Pedestrian Score	Rating
Greater than 98	✓✓ Best
Between 90 and 98	✓ Good
Less than 90	▲ Fair

## Findings

Six alternatives received the highest quantitative scores and were rated well in the qualitative assessment and were rated 'best.' Overall, these alternatives would likely provide a significantly better pedestrian environment than the other alternatives. Typical characteristics of these alternatives include areas of active pedestrian activity, a variety of nearby services, ample sidewalks, narrow streets, pedestrian-oriented land uses, and comfortable streets with a human feel. Of course conditions vary along alternatives. For example, any segments crossing I-35E and I-94 are less pedestrian friendly due to a lack of sidewalks, significant pedestrian barriers, and safety issues.

- **Arcade + Maryland** scored very well in the quantitative assessment due to a narrow average road width and a greater density of sidewalks. The alternative has some mixed use activity north of Phalen Boulevard.
- **Grand + Cleveland** was one of the highest scoring alternatives, particularly for the walkscore and the sidewalk density score. The Grand Avenue corridor in particular has vibrant and active pedestrian activity.
- **Grand + Cretin** scored very well in the quantitative assessment due to a very dense network of sidewalks and a narrow average road width. The Grand Avenue corridor has a strong sense of place and identity.
- **Payne** scored very well in all three quantitative scores, though the walkscore score was particularly high. The segments north of Phalen Boulevard had a particularly strong pedestrian environment.
- **Selby + Marshall** scored very well in all three quantitative scores. The alternative is characterized by comfortable residential and vibrant commercial areas.
- **Selby + Snelling** scored very well in the quantitative scores but particularly the sidewalk density score, where the alternative received the highest score of any alternative. The alternative is characterized by active pedestrian activity and comfortable areas.

The following nine segments scored among the middle of the alternatives. These alternatives would provide a less attractive pedestrian environment than the top scoring alternatives, but still be adequate for the pedestrian.

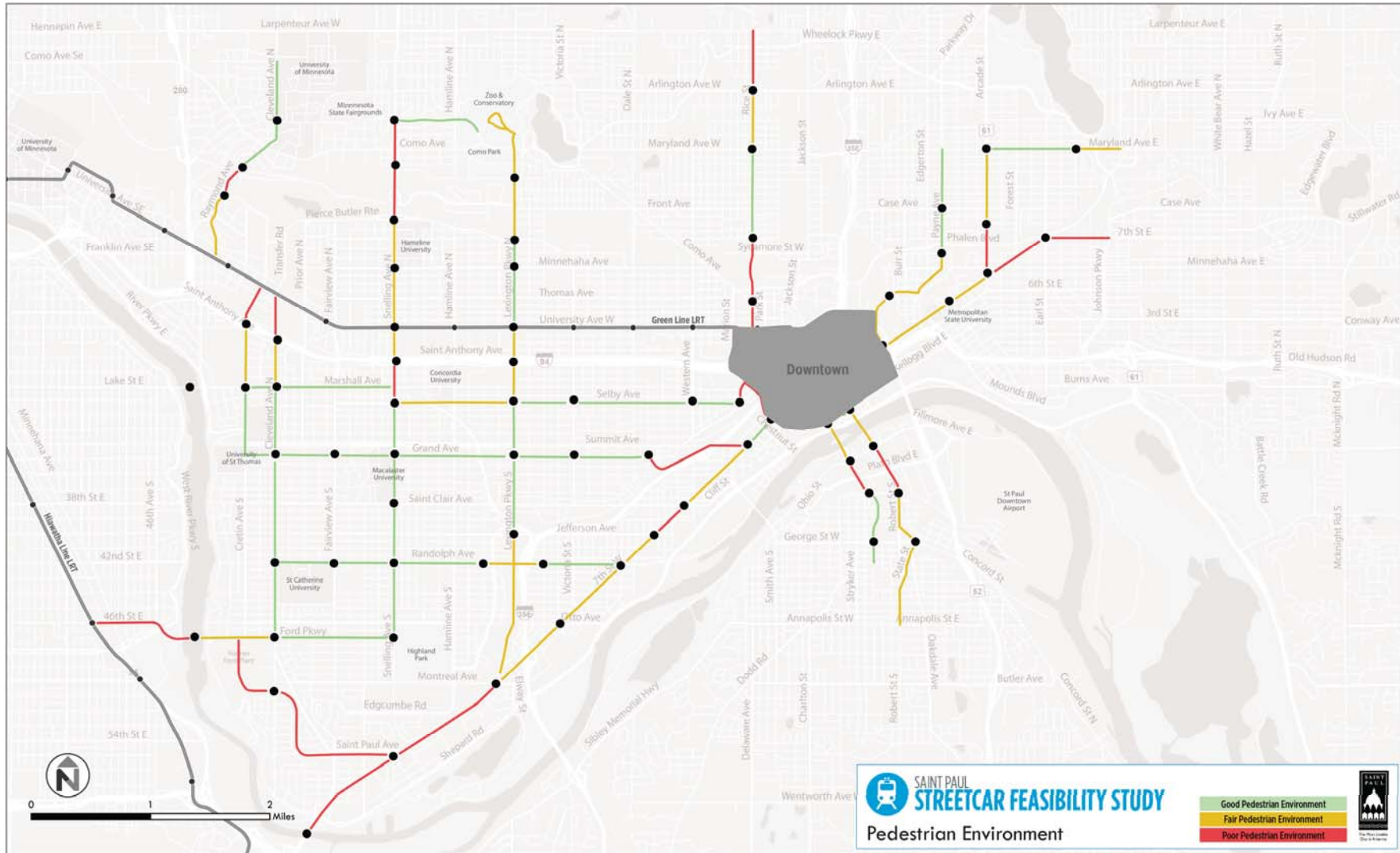
- **Cleveland** scored below average in the quantitative assessment but scored very well in the qualitative assessment. The alternative is characterized by good pedestrian facilities and a very connective street network. Average street width is larger than average.
- **East 7<sup>th</sup>** scored about average in the quantitative assessment but only fair in the qualitative assessment. While the alternative has average sidewalk density and road widths, the corridors suffer from multiple highway barriers, large vacant parcels (though many are targeted for redevelopment), as well as a lack of a sense of place.
- **Lexington South** scored very well in sidewalk density, though the alternative received a low walkscore and has a wide average road width. Lexington Parkway is an auto-oriented parkway and not an ideal pedestrian environment. Highway barriers are significant along this alternative, particularly in the southern Lexington Avenue area.
- **Randolph + Ford** received an average score in the qualitative and quantitative assessments. The corridor is characterized by a mix of residential and commercial clusters. The segments along Randolph Avenue are the most active and vibrant.
- **Rice** received an average overall score, though the alternative scored well in the average road width assessment. The corridor is characterized by a mix of land uses, though there are some parcels with large auto-oriented land uses.
- **Robert** received average scores in the quantitative assessment, though the qualitative assessment was only fair. The alternative is characterized by very auto-oriented land uses south of the Mississippi River.

- **Snelling + Ford** scored above average in the quantitative assessment, particularly in the sidewalk density assessment. The corridor has a good mix of land uses and pedestrian accessibility.
- **Snelling North** scored very well in the road width assessment (best among the alternatives), but very poor in the walkscore score (worst among the alternatives). The alternative is characterized by a lack of services, auto-oriented land uses, and a lack of pedestrian facilities.
- **Wabasha** scored very well in the walkscore assessment but below average in the road width assessment. The Humboldt Avenue segments are characterized by dense and active residential neighborhoods, though the Wabasha Street segments south of downtown are very auto-oriented.













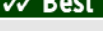






Four segments received very low scores. These alternatives are generally characterized by auto-oriented design and land uses, low pedestrian activity, a lack of nearby services, a poor network of sidewalks, wide streets, and a pedestrian environment that lacks a human scale and feel.

- **Lexington North** received the lowest walkscore score among all the alternatives, though its sidewalk density score was about average and its road width score was above average. The alternative is characterized by adequate pedestrian facilities directly along the corridor, but Lexington Parkway is an auto-oriented parkway and not an ideal pedestrian environment. The corridor is comprised of auto-oriented land uses and a significant lack of pedestrian facilities off the corridor.
- **Raymond** received the lowest overall quantitative score among all the alternatives, particularly due to poor sidewalk density and road width scores, both of which were lowest among the alternatives. The alternative is characterized by a non-grid street network and lack of pedestrian facilities.
- **West 7<sup>th</sup>** received a very low quantitative score, particularly on the sidewalk density assessment and the walkscore score. The West 7<sup>th</sup> Street corridor is characterized by a very auto-oriented design, a significant lack of sidewalks (particularly on the south side of the corridor), and a pedestrian environment that lacks a sense of place. Redevelopment opportunities along the alternative may improve the localized pedestrian conditions.
- **West 7<sup>th</sup> + Ford Spur** received scores similar to the West 7<sup>th</sup> alternative. The alternative's sidewalk density score was very low and the West 7<sup>th</sup> Street corridor is characterized by a very auto-oriented design, a lack of pedestrian network on the south side of the corridor, and a pedestrian environment that lacks a sense of place. Redevelopment opportunities along the alternative, particularly the Ford redevelopment site, may improve the localized pedestrian conditions.

Figure 1 – Pedestrian Environment by Potential Streetcar Segment



**Table 2 – Pedestrian Environment Assessment**

Alternative	Walkscore Score	Sidewalk Density Score	Road Width Score	Overall Score	Qualitative Assessment of the Pedestrian Environment	Rating
Arcade + Maryland	79	90	90	98	<b>Good.</b> Fairly dense and mixed use neighborhoods north of Phalen Boulevard. I-94 acts as a barrier in multiple places.*	 <b>Best</b>
Cleveland	76	85	77	90	<b>Best.</b> High residential density, good pedestrian facilities, and very connective street network.	 <b>Good</b>
East 7 <sup>th</sup>	75	86	89	94	<b>Fair.</b> Lack of access and poor connections from neighborhoods to downtown: highway barriers, large vacant land parcels, and no sense of place along route.	 <b>Good</b>
Grand + Cleveland	86	98	80	100	<b>Best.</b> Vibrant and active pedestrian realm along Grand Avenue. West 7 <sup>th</sup> Street poses pedestrian safety and access issues. I-35E and I-94 act as barriers.	 <b>Best</b>
Grand + Cretin	84	95	80	98	<b>Best.</b> Strong sense of place and identity along Grand Avenue. Safety and access concerns on highway segments. I-35E and I-94 act as barriers.	 <b>Best</b>
Lexington North	58	75	94	85	<b>Fair.</b> Dense and comfortable pedestrian environment directly on the corridor. Becomes very auto-oriented north of Pierce Butler and lacks sidewalks off the corridor.	 <b>Fair</b>
Lexington South	68	97	75	91	<b>Fair.</b> Fairly dense residential neighborhood with varying pedestrian amenities along the corridor. I-35E acts as a barrier.	 <b>Good</b>
Payne	85	89	87	99	<b>Good.</b> Dense and active commercial center along Payne Avenue. I-94 acts as a significant barrier for access	 <b>Best</b>
Randolph + Ford	79	89	80	94	<b>Good.</b> Mix of residential and commercial clusters along corridor; most active and vibrant along Randolph Avenue.	 <b>Good</b>
Raymond	69	59	71	75	<b>Fair.</b> Non-grid street network and lack of sidewalk network off the corridor; corridor itself contains decent pedestrian infrastructure and access.	 <b>Fair</b>
Rice	81	80	91	95	<b>Good.</b> Varying land uses along corridor however large segments along Rice Street are auto-oriented and highways (94 and 35E) pose access and safety issues.*	 <b>Good</b>
Robert	78	82	85	92	<b>Good.</b> Robert Street becomes extremely auto-oriented south of the bridge. Pedestrian environment gradually improves along State Street (mainly residential).	 <b>Good</b>
Selby + Marshall	83	96	81	99	<b>Best.</b> Comfortable residential and vibrant commercial areas along corridor. I-35E poses safety and access issues.	 <b>Best</b>
Selby + Snelling	84	100	81	100	<b>Good.</b> Active pedestrian realm along corridor, however I-94 & I-35E pose access and safety concerns.	 <b>Best</b>
Snelling + Ford	76	98	79	96	<b>Good.</b> Good mix of land uses and pedestrian access throughout corridor. I-94 acts as a major barrier.	 <b>Good</b>
Snelling North	61	79	100	91	<b>Fair.</b> Pierce Butler is major barrier with lack of adequate pedestrian facilities; auto-centric infrastructure, which continues through the corridor.	 <b>Good</b>
Wabasha	85	84	77	93	<b>Good.</b> Dense and vibrant residential neighborhood along Humboldt Avenue, however Wabasha Street south of the bridge is extremely auto-centric.	 <b>Good</b>
West 7 <sup>th</sup>	67	60	80	78	<b>Good.</b> Auto-oriented design and lack of identity and sense of place. West 7 <sup>th</sup> Street also becomes limited access roadway south of the Mississippi River, however there are pedestrian facilities on the bridge and up to Fort Snelling.*	 <b>Fair</b>
West 7 <sup>th</sup> + Ford Spur	78	61	77	82	<b>Good.</b> Good mix of land uses with varying pedestrian environments, however still very auto-oriented. Ford redevelopment site could improve pedestrian environment.*	 <b>Fair</b>

\* Rankings take into account potential redevelopment plans along the corridor. Rankings would have otherwise been lower.

## Equity




For transit projects that take advantage of New Starts/Small Starts funding through the federal government, the project sponsors must demonstrate its mobility benefits, and especially the benefits to those who depend on transit for their livelihood. A transit system that enables accessibility through good connections with jobs, retail centers, and social services increases the number of opportunities that transit-dependent populations have. Additionally, when a project affects current service design in some way, the changes must not place undue hardship on existing riders. This section evaluates how well the Phase 2 streetcar lines would serve Saint Paul’s communities of color, populations in poverty, and zero vehicle ownership populations.

## Methodology

**Communities of Color.** To conduct this analysis, census blocks from the 2010 Census (SF1) that had their geometric center within one half mile of each alternative were selected in GIS. One-half mile "catchment areas" are consistent with FTA New Starts/Small Starts guidelines for this measure. Information collected included the sum of the selected blocks for the non-white population and total land area (acres), which allowed for a straightforward density calculation of communities of color.

**In Poverty and Zero Vehicle Population.** The process for calculating the density of individuals in poverty and individuals without a vehicle was similar to the above process. The statistics for both measures are from the American Community Survey (ACS) 5-Year Estimates (2007–2011) and are at the census block group unit of analysis. Again, the data was compiled in GIS and half-mile buffers were used as catchment areas for each streetcar alternative. The ACS reports poverty status and vehicle ownership at the household level, so the study team gathered the sum of the households in poverty and the households without a vehicle for all census block groups that had their geometric center within each catchment area. To compare all measures at the individual level, the study team multiplied the number of households in each condition by the average number of persons per household in Saint Paul (2.47). Finally, the values were divided by the total acreage of land (after subtracting the area of large water bodies) to achieve density values.

**Overall Ridership Estimation Index.** Density (persons per acre) calculations remove any bias due to the different alignment lengths, so all of the factors were combined to achieve an overall index value for each alternative. The values for each factor were summed and indexed on a scale from 0 to 100, where 100 is the highest scoring alternative. Each alternative was rated according to their final index score:

Equity Index	Rating
> 80	 <b>Best</b>
30 – 80	 <b>Good</b>
≤ 30	 <b>Fair</b>

## Findings

Concentrations of populations with a high propensity to use transit in Saint Paul generally exist between Selby Avenue and Pierce Butler Route, along the Rice Street corridor, east of I-35E, and on W 7<sup>th</sup> Street near Davern Street, though there are other clusters or small pockets of these populations throughout the city. In downtown Saint Paul, the density of populations in each condition varies greatly, with blocks at both high and low extremes.

Five alternatives received a rating of best, indicating that streetcar service provides the greatest mobility benefit to the populations served along these alternatives (see Table 1). Three out of the five alternatives are on the east side of Saint Paul, with one other close by on Rice Street.

- **Arcade + Maryland** serves dense communities of color along Arcade Street north of Phalen Boulevard and along Maryland Avenue, especially to the south and east. This alternative also captures some communities of color south of East 7<sup>th</sup> Street. The alternative has significant population without vehicles near Case Avenue and near the alternative’s terminus at Clarence Street. These two areas also have significant populations in poverty.

Table 1. Service to Populations with a High Propensity to Use Transit

Alternative	Populations within ½ mile of each alternative (persons per acre)				Index	Rating
	Communities of Color	In Poverty	Zero Vehicle			
Arcade + Maryland	5.2	2.8	2.7	90	✓✓ Best	
Cleveland	0.9	0.8	1.3	28	▲ Fair	
East 7 <sup>th</sup>	5.0	2.9	2.8	89	✓✓ Best	
Grand + Cleveland	1.7	1.7	2.4	54	✓ Good	
Grand + Cretin	1.7	1.7	1.8	46	✓ Good	
Lexington North	3.3	1.9	1.1	50	✓ Good	
Lexington South	2.8	2.1	1.3	49	✓ Good	
Payne	5.0	3.2	3.4	100	✓✓ Best	
Randolph + Ford	1.3	1.3	1.7	38	✓ Good	
Raymond	1.5	0.9	0.4	22	▲ Fair	
Rice	4.9	2.8	3.2	96	✓✓ Best	
Robert	2.5	1.6	3.8	75	✓ Good	
Selby + Marshall	3.1	2.8	2.9	75	✓ Good	
Selby + Snelling	3.5	2.9	3.4	87	✓✓ Best	
Snelling + Ford	1.2	0.9	0.9	25	▲ Fair	
Snelling North	1.6	1.4	1.2	35	✓ Good	
Wabasha	2.4	2.3	3.6	74	✓ Good	
West 7 <sup>th</sup>	1.4	1.5	2.0	43	✓ Good	
West 7 <sup>th</sup> + Ford Spur	1.6	1.7	1.9	43	✓ Good	

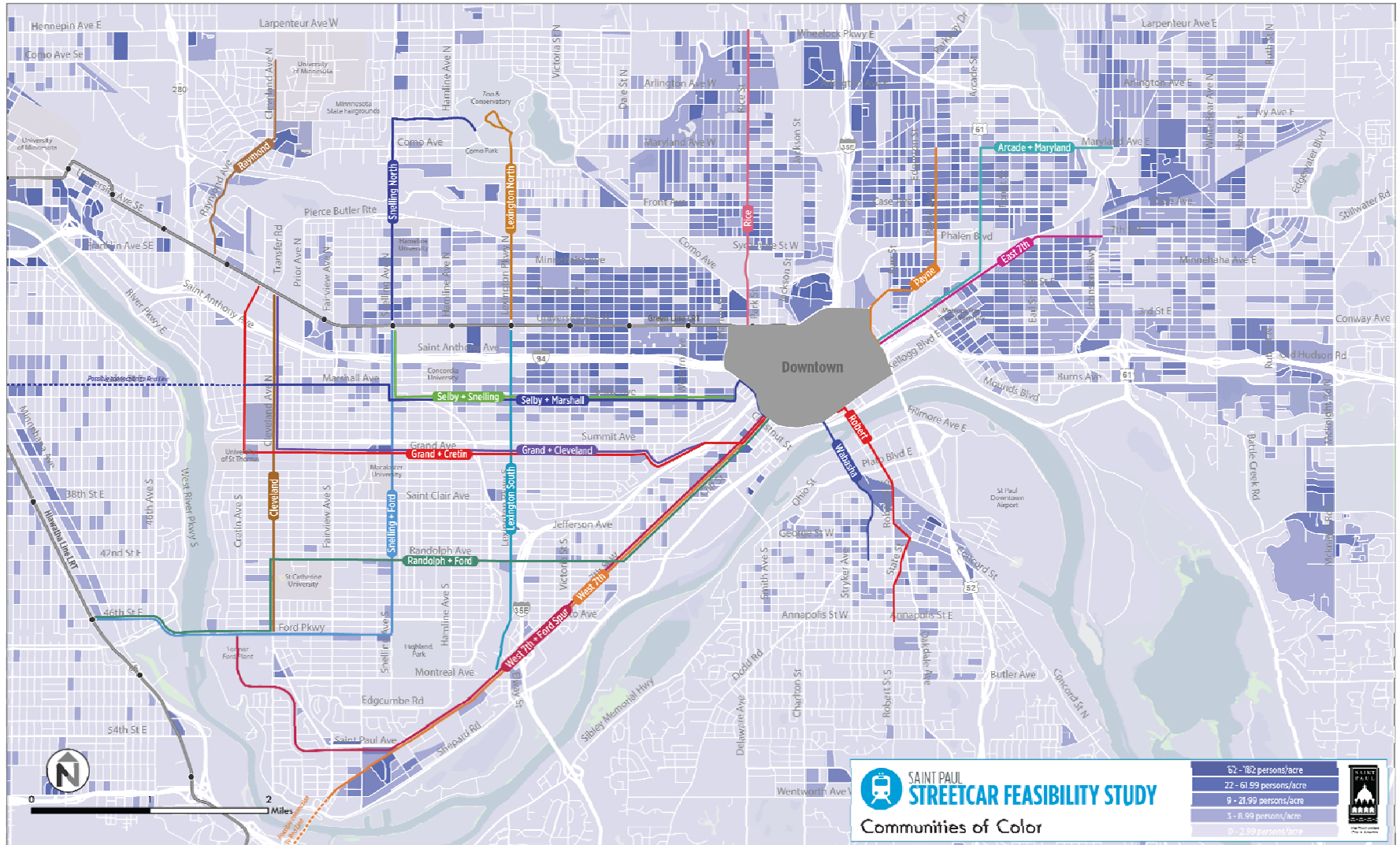
- **East 7<sup>th</sup>** has high densities of communities of color along its entire alignment, especially south of the East 7<sup>th</sup> Street corridor. The greatest number of residents without a vehicle is concentrated on the inner portion, west of Maple Street.
- **Payne** serves high densities of communities of color north of Phalen Boulevard. South of Phalen Boulevard, the area west of the alignment has a much higher density than to the east. The largest clusters of populations without vehicles are located near Case Avenue as well as south of Phalen Boulevard. A significant population in poverty is also spread along the entire alternative.
- **Rice** serves dense communities of color north of Sycamore Street until reaching Larpenteur Avenue, and west of Rice Street south of Como Avenue. The area with the greatest population without vehicles or in poverty is located above Arlington Avenue and below Sycamore Street.
- **Selby + Snelling** has a high-density cluster of communities of color north of the alignment, east of Lexington Parkway. At the western terminus of the alignment, there is also a small moderate-density cluster of communities of color. Populations in poverty and zero-vehicle populations follow a similar pattern.

The following alternatives would serve some transit-dependent populations but significantly fewer than the above lines:

- **Grand + Cleveland** and **Grand + Cretin** serve pockets of communities of color along West 7<sup>th</sup> Street and at Snelling Avenue, though density varies. The alternatives also serve the communities of color south of Selby Avenue. Areas with persons in poverty exist between Cleveland and Snelling as well as on the inner portion east of Dale Street. Populations without a vehicle are in similar areas.
- **Lexington North** serves dense communities of color on the portion south of Pierce Butler Route, especially to the west. The area north of Pierce Butler Route becomes less residential, and there are few pockets of communities of color. Most populations without a car or in poverty are located south of Minnehaha Avenue.
- **Lexington South** serves high densities of communities of color primarily around the northern  $\frac{3}{4}$ -mile of the alignment. South of Selby Avenue has fewer communities of color, as well as fewer persons without a car or in poverty.
- **Randolph + Ford** has some areas with a low- to moderate-density of communities of color along its entire alignment. The area along West 7<sup>th</sup> Street south to Saint Clair Avenue is a minor cluster. There are clusters near Snelling Avenue and Hamline Avenue that have high populations in poverty and without a vehicle.
- **Robert** serves a small low- to moderate-density cluster of communities of color south of the river and mostly east of the alignment. Most populations in poverty are located south of Cesar Chavez Street; however, the larger population without a vehicle is west of Robert Street and east of Wabasha Street.
- **Selby + Marshall**, similarly to Selby + Snelling, has a cluster of high-density communities of color north of the alignment, particularly east of Lexington Parkway. West of Lexington Parkway, pockets of low-density communities of color occur but are rare. Areas of populations without vehicles and in poverty are in similar locations.
- **Snelling North** serves few communities of color, but there are some low-density pockets south of Pierce Butler Route to the east and west of the alignment. The largest pockets of population without vehicles and in poverty, however, are located south of Minnehaha Avenue.

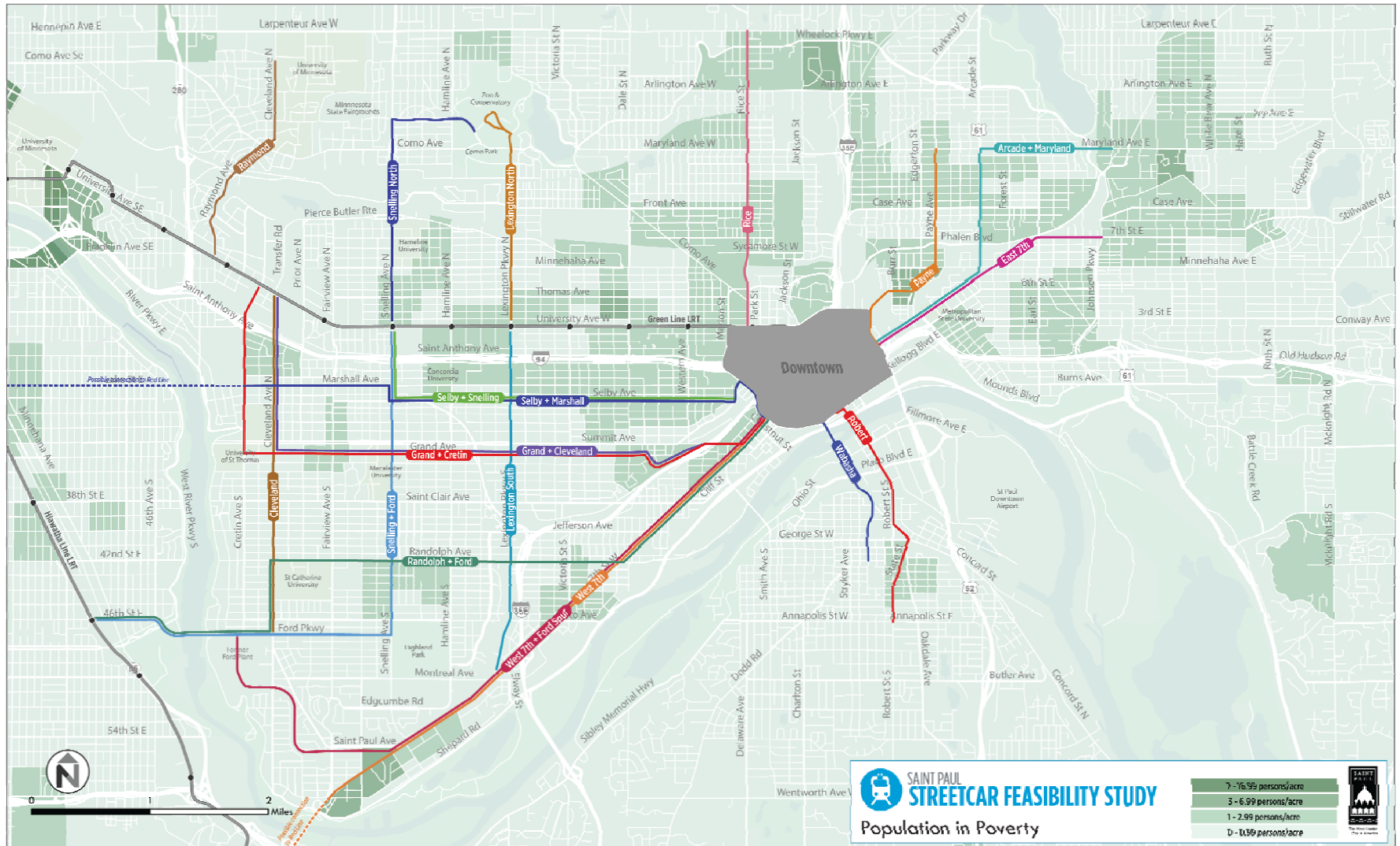


Figure 1. Communities of Color



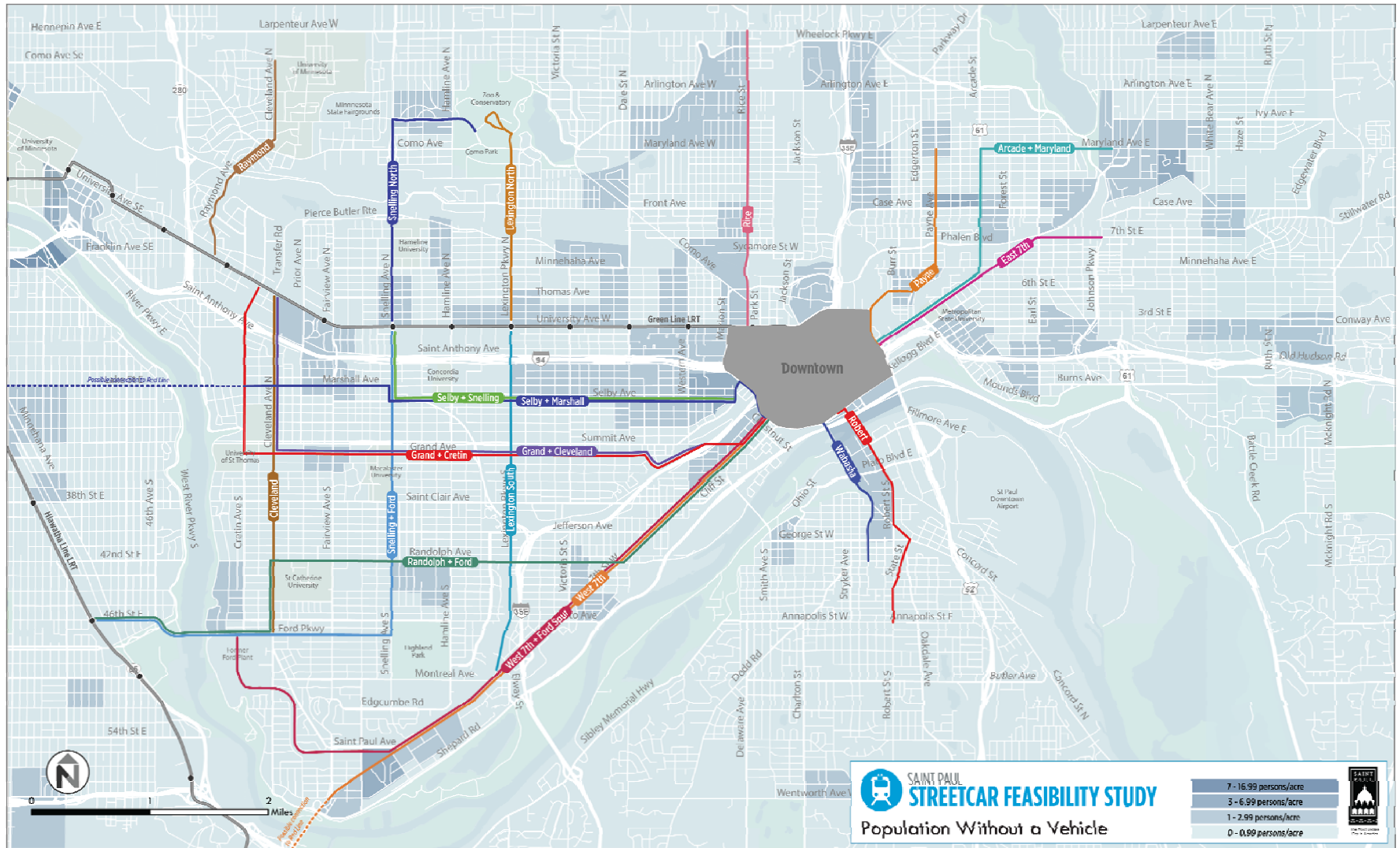
Source: Census 2010 SF1, by Block

Figure 2. Population in Poverty



Source: American Community Survey (ACS) 5-Year Estimates, 2007-2011, by Block Group

Figure 3. Population without a Vehicle



Source: American Community Survey (ACS) 5-Year Estimates, 2007-2011, by Block Group

- **Wabasha** serves a small low- to moderate-density cluster of communities of color along Robert Street, and some very small pockets elsewhere in the West Side neighborhood. The largest populations without vehicles are located east of Wabasha Street and west of Robert Street. The most significant area with populations in poverty is south of George Street.
- **West 7<sup>th</sup> and West 7<sup>th</sup> + Ford Spur** serve small pockets of low-density communities of color along their entire alignments. Higher density areas occur in the southeast corner of Saint Paul Avenue and Davern Street, and along West 7<sup>th</sup> Street north of Saint Clair Avenue. This area also has larger densities of populations in poverty as well as zero vehicles.

The following lines would serve far fewer populations that tend to rely on transit:

- **Cleveland** serves very few communities of color. One moderate-density pocket exists bounded by Cretin, Cleveland, Selby, and Summit Avenues, which is part of the University of Saint Thomas and includes some of the university's dormitories. The alternative, however, does have some pockets of populations in poverty, particularly north of Saint Clair Avenue. There are few areas with vehicle-less populations, except for near University Avenue.
- **Raymond** has some pockets of low-density communities of color in the student housing area of the University of Minnesota – Saint Paul campus, and around the southern terminus of the alignment. There is a slight cluster of population in poverty near the university's border; however, populations without a vehicle are low.
- **Snelling + Ford** serves communities of color primarily around its northern terminus; this cluster is low- to moderate-density. The remainder of the alignment serves very few communities of color. Some clusters of populations in poverty are located south of Randolph Avenue as well as near the river and north of Ford Parkway. Populations without vehicles are located in similar areas.

## On-Street Parking Impacts

Streetcar service would likely impact on-street parking due to the space requirements for streetcar stops. Like standard bus stops, streetcar stops require a continuous and unobstructed length of curb space. Often there are opportunities to site streetcar stops along curb space without existing parking. Occasionally, however, parking would need to be removed to create unobstructed curb space sufficient for a streetcar stop. The following section provides general estimates of the parking impacts of each potential streetcar line.




### Methodology

Google Maps' Streetview tool was used to assess existing parking conditions along the streetcar line segments outside of downtown. The study team used this tool, which provides a full photographic view of potential streetcar stop sites, to estimate the amount of on-street parking that might be lost at each streetcar stop. Potential stops were assumed at intersections approximately every 1/5-mile. To assess the impacts, the following assumptions were made:

- At locations with an existing bus stop, the streetcar would utilize the existing stop, plus two adjacent on-street parking spaces (if present) to accommodate the longer length of streetcar vehicles.
- At locations without an existing bus stop, a new stop would be created, and to eliminate six on-street parking spaces (if present).
- At locations where on-street parking is currently prohibited, no spaces would be impacted.

The number of impacted parking spaces per segment of each streetcar line was calculated for both directions of service. For each segment, the average number of impacted parking spaces per streetcar stop was calculated (using an average impact per streetcar stop removed the influence of an alternative's length from its score). Figure 1 illustrates the average impact per stop for both directions of each segment.

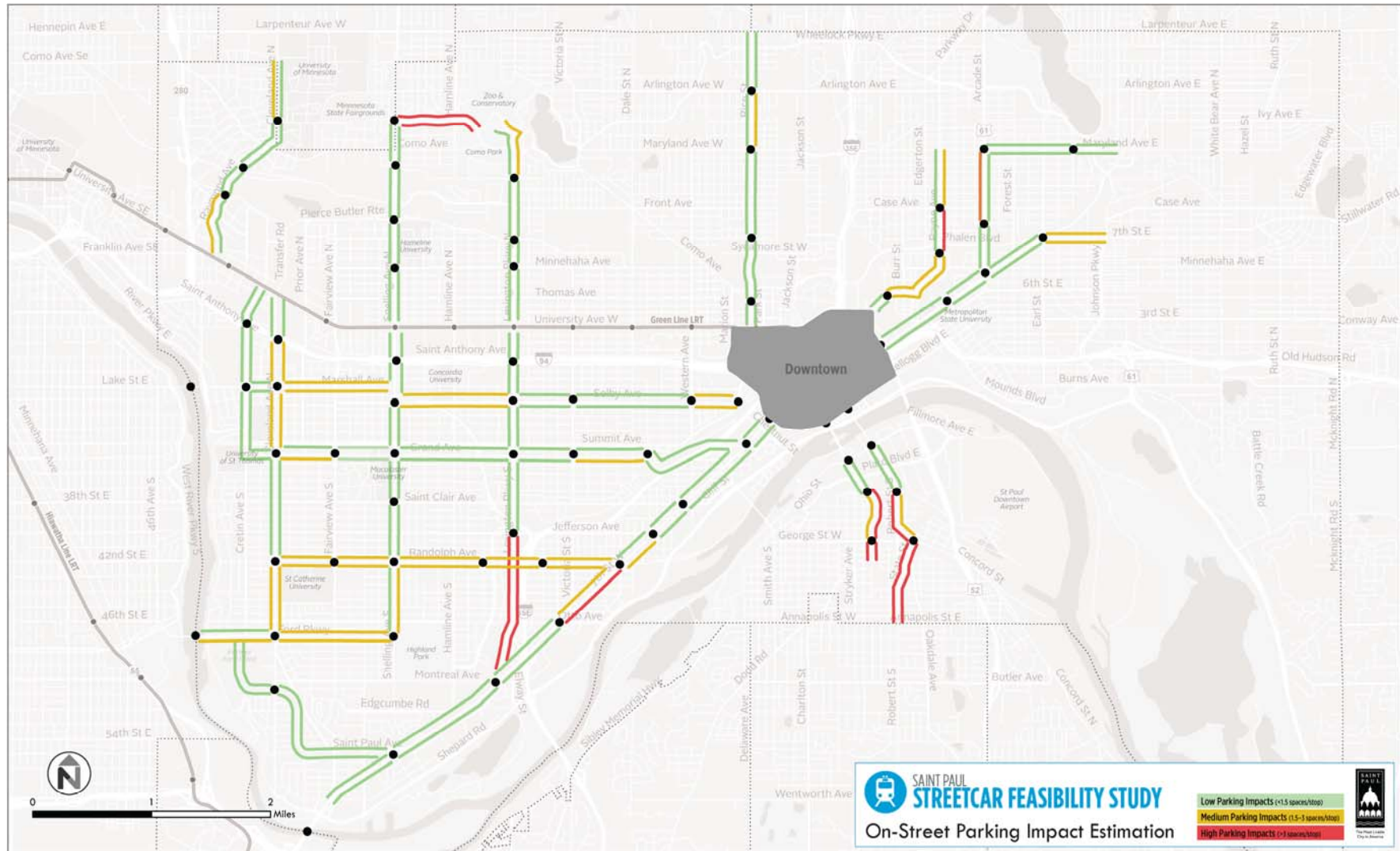
To achieve an overall score for each streetcar line, the average number of impacted parking spaces per streetcar stop was also calculated for each direction of the entire line, as well as for both directions as a whole. These averages were then indexed on a scale from 0 to 100 to allow comparison between lines. This index was used as the basis for the ratings, as shown below:

Parking Impacts Index	Rating
90 – 100	 <b>Best</b>
80 – 90	 <b>Good</b>
< 80	 <b>Fair</b>




















### Findings

Overall, the vast majority of streetcar stops could utilize existing bus stops, thus minimizing the number of impacted parking spaces. As a result, a large part of the variation in scores between potential streetcar lines is dependent on whether there is on-street parking adjacent to the existing stops (which would be impacted from lengthening the stop for streetcar). Also, a small number of locations have no feasible existing bus stop that could be utilized and would require removing significant on-street parking to create a new stop.

Figure 1 – Parking Impacts



**Table 1 – Parking Impact Score**

Alternative	Inbound		Outbound		Overall Parking Impact Score	Rating
	Impacted Spaces	Score	Impacted Spaces	Score		
E 7 <sup>th</sup>	6	93	6	93	93	 <b>Best</b>
W 7 <sup>th</sup>	20	90	10	95	93	 <b>Best</b>
W 7 <sup>th</sup> + Ford Spur	24	91	40	85	88	 <b>Good</b>
Cleveland	22	83	36	76	79	 <b>Fair</b>
Arcade + Maryland	6	95	0	100	98	 <b>Best</b>
Grand + Cleveland	38	85	26	90	87	 <b>Good</b>
Grand + Cretin	24	91	18	93	92	 <b>Best</b>
Lexington N	0	100	6	93	96	 <b>Best</b>
Lexington S	18	86	18	86	86	 <b>Good</b>
Payne	12	85	22	73	79	 <b>Fair</b>
Raymond	16	84	6	94	89	 <b>Good</b>
Randolph + Ford	42	82	28	88	85	 <b>Good</b>
Rice	4	97	8	93	95	 <b>Best</b>
Robert	16	77	18	74	76	 <b>Fair</b>
Selby + Marshall	28	84	26	86	85	 <b>Good</b>
Selby + Snelling	20	88	20	88	88	 <b>Good</b>
Snelling + Ford	22	88	12	93	91	 <b>Best</b>
Snelling N	12	93	22	88	91	 <b>Best</b>
Wabasha	14	77	12	76	76	 <b>Fair</b>

The following streetcar lines would have minimal parking impacts, and were rated as “best” (see also Figure 1 and Table 1):

- **East 7th** would likely have very few parking impacts, as most streetcar stops would be able to utilize existing bus stops in areas with no on-street parking. Some parking would be impacted along the route, where some spaces would need to be removed to accommodate longer streetcar vehicles.
- **West 7th** would likely have very few parking impacts, as most streetcar stops would be able to utilize existing bus stops in areas with no on-street parking. Some parking would be impacted between Otto Avenue and Jefferson Avenue, where a few new stops would need to be created and other parking spaces removed to accommodate longer streetcar vehicles.

- **Arcade + Maryland** would likely have very few parking impacts, as most streetcar stops would be able to utilize existing bus stops in areas with no on-street parking. Some parking would be impacted along Arcade Street, where some spaces would be removed to accommodate longer streetcar vehicles.
- **Grand + Cretin** would likely have limited parking impacts, as most streetcar stops would be able to utilize existing bus stops, though many are located in areas with on-street parking. Some spaces would need to be removed to accommodate longer streetcar vehicles.
- **Lexington North** would likely have limited parking impacts, as there is limited on-street parking along Lexington Parkway. A new stop may need to be created in the vicinity of Como Park.
- **Rice** would likely have limited parking impacts, as most streetcar stops would be able to utilize existing bus stops and most of the new stops would be sited in locations without on-street parking.
- **Snelling + Ford** would likely have limited parking impacts, as most streetcar stops would be able to utilize existing bus stops, though many are located in areas with on-street parking. Some spaces would need to be removed to accommodate longer streetcar vehicles.
- **Snelling North** would likely have limited parking impacts, as most streetcar stops would be able to utilize existing bus stops with no on-street parking. On Midway Parkway, there would be more significant parking impacts due to a lack of existing bus stops.

The following lines would have moderate impacts on parking, and were rated as “good.”

- **West 7th + Ford Spur** would likely have few parking impacts, as most streetcar stops would be able to utilize existing bus stops with no on-street parking (similar to West 7<sup>th</sup>). Some parking would be impacted between Otto Avenue and Jefferson Avenue, where a few new stops would need to be created and other parking spaces removed to accommodate longer streetcar vehicles. The Ford Spur segment would have no impacts, while the short segment on Saint Paul Avenue would impact some parking spaces.
- **Grand + Cleveland** could utilize existing stops along Grand Avenue, which would minimize the number of impacted spaces. On Cleveland Avenue, however, there would be more significant parking impacts due to removing parking to create new stops as well as removing parking to lengthen existing bus stops to accommodate longer streetcar vehicles.
- **Lexington South** would likely have limited parking impacts north of Randolph Avenue, as there is limited on-street parking along this part of Lexington Parkway. South of Randolph Avenue, significant parking would have to be removed to create several new stops.
- **Raymond** would likely have minimal impact on the eastern (northbound) side of the street, as on-street parking exists only on the west side of the street. On the west side of the street, most streetcar stops could utilize existing stops, minimizing the on-street parking impact.
- **Randolph + Ford** would likely have moderate parking impacts, as most streetcar stops would be able to utilize existing bus stops, though most are located in areas with on-street parking. Some spaces would need to be removed to accommodate longer streetcar vehicles.
- **Selby + Marshall** would likely have moderate parking impacts, as most streetcar stops would be able to utilize existing bus stops, though most are located in areas with on-street parking. Some spaces would need to be removed to accommodate longer streetcar vehicles.
- **Selby + Snelling** would likely have moderate parking impacts, as most streetcar stops would be able to utilize existing bus stops, though most are located in areas with on-street parking. Some spaces would need to be removed to accommodate longer streetcar vehicles.

The following lines would have significant parking impacts and were rated as “fair.”

- **Robert** could generally utilize existing bus stops north of George Street, where there is limited on-street parking. However, there would be more significant impacts south of George Street, where on-street parking would need to be removed in order to accommodate new stops.
- **Cleveland** would also have significant parking impacts because there is on-street parking along the corridor, which would be impacted by lengthening existing bus stops to accommodate longer



streetcar vehicles. In addition, there are several locations where parking would have to be removed to create new streetcar stops.

- **Payne** would have significant impacts east of Burr Street because many of the existing bus stops that would be used for streetcar stops have on-street parking that would have to be removed. In addition, there are a few locations where parking would have to be removed to create new streetcar stops.
- **Wabasha** could generally utilize existing bus stops north of George Street, where there is limited on-street parking. However, there would be more significant impacts south of George Street, where on-street parking would need to be removed in order to accommodate new stops.

## Community Support

Saint Paul has a rich history of active and distinct neighborhoods. The City of Saint Paul encourages neighborhood participation in governance, planning, and advising on the physical, economic, and social development of their areas.

The City has been working to inform and educate the public about what streetcars are, and how they can benefit communities and neighborhoods. Having the support of the community will be important in moving forward with plans for streetcar in any of these corridors. As streetcar service is studied more extensively and more information is brought to the public and the neighborhoods, community support may shift, and ongoing conversations with the communities surrounding any proposed lines will be essential to the success of a potential streetcar network.

## Methodology

To assess the levels of support amongst the communities across Saint Paul, City staff directly engaged with the 17 District Councils and other community groups. Neighborhood plans were also consulted for references to streetcars or trolley lines. Additionally, the City's official online forum, Open Saint Paul at [www.stpaul.gov/open](http://www.stpaul.gov/open), was used to gather additional input from individuals across Saint Paul. The Transportation Committee of the Planning Commission, a group of appointed citizens representing citywide interests from a variety of modal viewpoints, was also consulted on this criterion.

Open Saint Paul is a relatively new tool, which was first introduced in 2012. Therefore, each line was rated only Good or Fair based on Open Saint Paul feedback. Open Saint Paul comments were accepted as part of this official report through June 7, 2013.

The two major benefits that streetcars can bring to a community are transit improvement and economic development. Therefore, if a community expressed a strong desire for both transit improvements and accompanying economic development, that line was given a rating of Best. If a community expressed a strong desire for either transit improvements or economic development, that line was given a rating of Good. If no strong support was expressed for either transit improvements or economic development, that line was given a rating of Fair.

To calculate the overall Community Support rating, these two measures were combined. Lines that received at least one Best rating received a Best rating overall. Lines that received two Fair ratings were given a Fair rating overall. All other lines received a Good rating.

## Findings

Six lines received Best ratings:

- **East 7<sup>th</sup>:** There were four comments supporting East 7<sup>th</sup> or more generally, an East Side streetcar line on Open Saint Paul. The community has been actively engaged in activities to support economic development along the corridor already, and has expressed a strong desire for improved transit.
- **Payne:** There were five comments supporting Payne Avenue or more generally, an East Side streetcar line on Open Saint Paul. The corridor has already been the focus of redevelopment activities and the community has expressed a strong desire for improved transit.
- **Rice:** There were three comments supporting Rice Street for a streetcar line on Open Saint Paul. The community has expressed a strong desire for redevelopment and improved transit.
- **Robert:** There was only one comment supporting Robert Street for a streetcar line on Open Saint Paul. However, the community has expressed a strong desire for improved transit, and is actively engaged in activities to support economic development along the corridor.

- **Selby + Snelling:** There were only two comments supporting the Selby + Snelling alignment for streetcar service on Open Saint Paul. However, the community has expressed a strong desire for redevelopment and for improved transit.
- **West 7<sup>th</sup>:** This corridor received the highest number of comments (eight) supporting streetcar service on Open Saint Paul. The community has expressed a strong desire for improved local transit service in the form of a streetcar, and is strongly interested in strengthening and improving existing development opportunities.

Nine lines received ratings of Good:

- **Arcade + Maryland:** There were four supporting comments on Open Saint Paul for a streetcar line on the Arcade + Maryland alignment, though they were primarily supporting East Side streetcar service more generally. The community has expressed a desire for improved transit service in this corridor, though not for significant economic development.
- **Grand + Cleveland:** There were three supporting comments on Open Saint Paul for a streetcar line on Grand Avenue. The community has expressed support for streetcar service that would enhance the existing business community, though not for significant economic development in the corridor.
- **Grand + Cretin:** As for the Grand + Cleveland alignment, there were three supporting comments on Open Saint Paul for a streetcar line on Grand Avenue. The community has expressed support for streetcar service that would enhance the existing business community, though not for significant economic development in the corridor.
- **Randolph + Cleveland + Ford:** There were only two supporting comments on Open Saint Paul for streetcar service on this alignment. The community has expressed a desire for improved transit service, though not for economic development.
- **Selby + Marshall:** There was only one supporting comment on Open Saint Paul for streetcar service on the Selby + Marshall alignment. The community has expressed a strong desire for economic development in part of this corridor.
- **Snelling N:** There were four supporting comments on Open Saint Paul for streetcar service on the Snelling north alignment. However, no significant support was expressed by the community for a streetcar line on this alignment, and there are plans for an Arterial Bus Rapid Transit that would largely cover this route.
- **West 7<sup>th</sup> + Ford Spur:** There were seven supporting comments on Open Saint Paul for streetcar service on the W. 7<sup>th</sup> + Ford Spur alignment. However, no significant support was expressed by the community for transit service in the Ford Spur portion of this alignment, though interest was expressed in economic development along this alignment.
- **Wabasha:** There was only one supporting comment on Open Saint Paul for streetcar service on Wabasha. The community expressed a desire for streetcar service on this alignment, though Robert Street was the preferred alignment for economic development opportunities.

Four lines received ratings of Fair:

- **Cleveland:** There was only one comment on Open Saint Paul supporting a streetcar line on Cleveland. No significant support was expressed by the community for a streetcar line on this alignment.
- **Lexington S:** There was only one comment on Open Saint Paul supporting a streetcar line on Lexington S. No significant support was expressed by the community for a streetcar line on this alignment.
- **Raymond:** There were no comments on Open Saint Paul supporting a streetcar line on Raymond. No significant support was expressed by the community for a streetcar line on this alignment.
- **Snelling S + Ford:** There were only two comments on Open Saint Paul supporting a streetcar line on Snelling south to Ford Parkway. No significant support was expressed by the community for a streetcar line on this alignment, as there are plans for an Arterial Bus Rapid Transit here.

**Table 1 Community Support**

Alternative	District Councils and Community Conversations	Open St Paul	Rating
Arcade + Maryland	Good	Good	✓ Good
Cleveland	Fair	Fair	▲ Fair
East 7 <sup>th</sup>	Best	Good	✓✓ Best
Grand + Cleveland	Good	Good	✓ Good
Grand + Cretin	Good	Good	✓ Good
Lexington North	Fair	Good	✓ Good
Lexington South	Fair	Fair	▲ Fair
Payne	Best	Good	✓✓ Best
Randolph + Ford	Fair	Fair	▲ Fair
Raymond	Fair	Fair	▲ Fair
Rice	Best	Fair	✓✓ Best
Robert	Best	Fair	✓✓ Best
Selby + Marshall	Good	Fair	✓ Good
Selby + Snelling	Best	Fair	✓ Good
Snelling + Ford	Fair	Fair	▲ Fair
Snelling North	Fair	Good	✓ Good
Wabasha	Good	Fair	✓ Good
West 7 <sup>th</sup>	Best	Good	✓✓ Best
West 7 <sup>th</sup> + Ford Spur	Good	Good	✓ Good




## Integration with Existing Bus and High Capacity Transit Investments

An important part of the Phase 2 evaluation is ensuring that streetcar service integrates as well as possible with existing and future transit services along each potential line. This is important not just from an operating cost perspective, but also to ensure that streetcar can physically be accommodated with other planned investments and/or ensure that the appropriate level of service is provided for the transit market in the corridor (i.e., limited or no duplication of service).

### Methodology

To determine how well streetcar could integrate with existing or future transit service along each Phase 2 line, the project team met with Metro Transit staff to qualitatively rate each line using a Best, Good or Fair rating system. The focus of the meeting was a review of the draft operating plans that were developed for each potential Phase 2 streetcar line. While the operating plans assumed streetcar service along the entire line, which is unlikely even in the long-term, the operating plans helped the project team compare the total operating cost of service along each potential line. The operating plans also allowed the group to discuss the impact streetcar would have on the underlying bus service, and specifically the potential to reduce (or eliminate) bus service and thus offset operating costs associated with streetcar.

A number of factors were discussed related to transit operations within each potential streetcar line, but ultimately the cost savings associated with potential bus replacement (if streetcar was present) was determined to be the best way to assess the integration with existing bus service. The follow table summarizes the process used to develop the ratings for each line:




Integration with Existing Bus	Rating
Streetcar could replace all or a significant amount of bus service with minimal disruptions to the passenger (i.e., forced transfers)	 <b>Best</b>
Streetcar could reduce some bus service in the corridor, and/or if streetcar would supplement existing bus service	 <b>Good</b>
Streetcar would have little or not impact on the underlying bus service, and/or there is no existing bus service operating along the line	 <b>Fair</b>

It is important to note that this section's evaluations are independent of the Operating Costs section, which estimated the costs associated with potential bus replacement along each potential line if streetcar were operational along the entire length of the line. The lines that scored well in this section, for example, may or may not score well in the operating cost section.

The project team and Metro Transit staff also qualitatively ranked each potential streetcar line in terms of how well it might integrate with planned high capacity transit services. Those services include:

- Green Line
- Arterial Bus Rapid Transit
  - Snelling (Snelling and Ford Parkway), which is planned for implementation in 2015
  - W. 7<sup>th</sup> Street, planned for implementation in 2016
  - Lake (Via Marshall/Snelling), being studied as part of the Midtown Corridor Alternatives Analysis
  - E. 7<sup>th</sup> Street, (via Arcade/Maryland), no projected implementation date
  - Robert Street, which is being studied as part of the Robert Street Transit Alternatives

- Rushline Corridor
- Gateway Corridor
- Riverview Corridor (which includes W. 7<sup>th</sup>)

Integration with Future High Capacity Transit	Rating
Streetcar would fully complement planned high capacity transit service by providing local service within a portion of the line in Saint Paul	 <b>Best</b>
Streetcar would somewhat complement planned high capacity transit service by providing local service within a portion of the line in Saint Paul	 <b>Good</b>
No high capacity transit planned along or near the potential streetcar line or streetcar would directly compete with a planned high capacity transit service.	 <b>Fair</b>

## Findings

A summary the ratings is provided in Table 2. In summary, five potential streetcar lines rated either Best or Good in terms of integration with existing bus service:

- **Randolph + Ford** was rated Best because if streetcar were provided along the entire length of the line (from downtown to the 46<sup>th</sup> Street Blue Line Station), there would be strong potential to replace all of Route 74 service, resulting in a significant operating cost savings
- **Grand + Cleveland** and **Grand + Cretin** were both rated as Good since there is a some potential for terminating existing Route 63 service from downtown to the Green line, assuming the streetcar corridor would connect at one of the Green Line stations (presumably the Raymond Avenue station).
- **Selby + Marshall** and **Selby + Snelling** were also rated as Good since there is potential to eliminate some (or all) Route 21 service between downtown and Snelling. This assumes that the Snelling Bus Rapid Transit service is in place and that connections to the Green Line are fast and convenient.

Only two potential lines were rated as Good in terms of integration with planned high capacity transit service:

- **Randolph + Ford** was rated Good because streetcar could be terminated in Saint Paul when the Bus Rapid Transit on Snelling and Ford Parkway is implemented.
- **West 7<sup>th</sup> Street** was rated as Good because the planned Bus Rapid Transit could provide service for those passengers traveling longer distances while streetcar could serve the short trips in Saint Paul, likely west of I-35E.

**Table 1. Evaluation of Bus and Current/Future High Capacity Transit Integration**

Alternative	Integration with Existing Bus	Integration with Planned/Future High Capacity Investments	Comments
Arcade + Maryland	▲ Fair	▲ Fair	Limited impact on bus replacement; could partially duplicate BRT planned via Arcade and Maryland; potential impact on new Rushline study (still to be released)
Cleveland	▲ Fair	▲ Fair	Limited impact on bus replacement; no planned high capacity service planned in the corridor
East 7th	▲ Fair	▲ Fair	Limited impact on bus replacement; no significant impact on BRT planned via Arcade and Maryland; potential impact on new Rushline study (still to be released)
Grand + Cleveland	✓ Good	▲ Fair	Some opportunity to replace bus service if extended to the Green Line at Raymond Station.
Grand + Cretin	✓ Good	▲ Fair	Some opportunity to replace bus service if extended to the Green Line at Raymond Station.
Lexington North	▲ Fair	▲ Fair	Limited impact on bus replacement (even when implemented with Green Line); no planned high capacity service planned in the corridor
Lexington South	▲ Fair	▲ Fair	Limited impact on bus replacement (even when implemented with Green Line); no planned high capacity service planned in the corridor
Payne	▲ Fair	▲ Fair	Limited impact on underlying bus service; potential impact on new Rushline study (still to be released)
Randolph + Ford	✓✓ Best	✓ Good	Strong potential to replace all bus service if streetcar is developed the entire length of the corridor; planned BRT in the Snelling/Ford Parkway corridor could allow streetcar to terminate in St. Paul (instead of continue to 46 <sup>th</sup> St. Station)
Raymond	▲ Fair	▲ Fair	Limited impact on bus replacement; no high capacity service planned
Rice	▲ Fair	▲ Fair	Limited impact on bus replacement; no high capacity service planned
Robert	▲ Fair	▲ Fair	Defer to Robert Street Transit Alternatives study
Selby + Marshall	✓ Good	▲ Fair	Some opportunity to terminate east-west bus service at Snelling if arterial BRT service is developed there as planned. The ACTS study provides service only to Snelling (from Uptown Station in Minneapolis via Lake and Marshall).
Selby + Snelling	✓ Good	▲ Fair	Some opportunity to terminate east-west bus service at Snelling if arterial BRT service is developed there as planned.
Snelling + Ford	▲ Fair	▲ Fair	Arterial BRT is currently planned on Snelling and the development of both services could present integration issues.
Snelling North	▲ Fair	▲ Fair	Arterial BRT is currently planned on Snelling and the development of both services could present integration issues.
Wabasha	▲ Fair	▲ Fair	Would not negatively or positively impact bus service or future HCT improvements, but would need be coordinated with potential services developed as a result of the Robert Street Transit Alternatives study.
West 7th	▲ Fair	✓ Good	Limited impact on bus replacement; Could compliment existing bus or ATCS service if only on the upper segment of the corridor (east of I-35E); Pending Riverview Corridor Study would further evaluate options for this corridor.
West 7th + Ford Spur	▲ Fair	▲ Fair	With extension to Ford Spur, streetcar would duplicate existing bus service, which continues to the airport and Mall of America; Pending Riverview Corridor Study would further evaluate options for this corridor.

## Operating Costs

One of the major considerations for any streetcar line is the operating cost associated with day-to-day operation and maintenance of the service. To estimate the difference between corridors in terms of operating costs, conceptual operating plans were developed for all Phase 2 corridors. It should be noted that for the purpose of the Phase 2 evaluation that streetcar services were evaluated based on service within the entire length of each corridor. In reality, it is unlikely that most of the corridors would be developed in their entirety, at least not initially, as streetcar service regionally is being viewed as a good mode for shorter trips and rapid or enhanced bus service more appropriate for longer regional trips. Through the Phase 2 evaluation, priority corridors will be identified and then more realistic, starter segments within the priority corridors will be developed for discussion in Phase 3.

## Methodology

One of the primary assumptions was that each line would operate independent of any other line, even though this may not be the case as the system is built out over time. It is likely that multiple lines in St. Paul would provide operating efficiencies, and thus lower costs, but this was not assumed at this time so as to develop conservative estimates.

Other assumptions made when developing the operating plans are summarized below.

## Frequency and Service Span

A major transit investment like streetcar assumes frequent service (between 15-20 minute headways for most of the service day, seven days a week) and long service span (with a minimum of 18 hours/weekday and Saturday and 16 hours on Sunday). Frequency and service span are the two primary factors that make a transit service attractive. The assumptions for frequency and service span for the different days of the week and time periods are provided below. Any changes to these assumptions will be noted under each streetcar corridor.

Figure 1. Assumed Streetcar Frequency and Service Span by Day and Time Period

Period	Time	Frequency			Service Span (Hours)		
		Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
AM Peak	6:00 – 9:00 AM	15	15	20	3	3	3
Midday	9:00 AM – 3:00 PM	15	15	20	6	6	6
PM Peak	3:00 PM – 6:30 PM	15	15	20	3.5	3.5	3.5
Early Evening	6:30 PM – 11:00 PM	15	15	30	3.5	3.5	3.5
Late Evening and Early AM	11:00 PM – 6:00 AM	30	30	-	2	2	-
<b>Total</b>		<b>15-30</b>	<b>15-30</b>	<b>20-30</b>	<b>18</b>	<b>18</b>	<b>16</b>

## Station Spacing

Unlike other rail transit services (like light rail and commuter rail), station spacing on streetcar is assumed to be similar to local bus service, or approximately 1/8 to 1/4 mile. This assumes there may be segments where stops are greater than 1/4 mile where it may not be possible or necessary to stop, such as bridges or freeway crossings. Specific stop locations were not identified in this phase of the evaluation; instead average stop spacings were assumed.



## **Fare Collection**

To reduce dwell times, it is assumed that streetcar fare collection would be handled either via ticket machines onboard streetcar vehicles or at stations. This would avoid the delays that occur with more traditional fare payment where all passengers board through a single door and pay at a farebox monitored by the driver.

## **Vehicles**

It is assumed that all streetcar vehicles would be modern, low-floor models that have a similar configuration to Portland or Seattle, which are 67 feet long and have a capacity of about 120 (seated/standing). It is also assumed that vehicles would be double-ended, meaning they can be operated in either direction.

## **Stations and Platforms**

Level or near-level boarding platforms are assumed for all streetcar stops, which facilitates boarding and alighting time (especially for individuals with mobility impairments or other large items such as strollers, carts, etc.).

## **Terminal and Layover Locations**

All terminal locations are conceptual—specific locations have not been identified at this phase of study. Reasonable turn-around or layover locations are developed only for initial costing purposes and would need to be explored further in future phases.

## **Running Time Estimates**

All running times are based on the operating characteristics of modern streetcars adjusted to reflect corridor characteristics. Running times include acceleration, deceleration, delay from signals, and dwell time at stops. Layover times are also included and based on Metro Transit's standard of 15% of total running time. Initial operating speeds were estimated at 10 mph for the AM peak, evening, and late evening time periods, and 9 mph for the midday and PM peak time periods (when there are generally more boardings, traffic and signal delay).

## **Existing Bus Service**

It is assumed that unless a potential streetcar line would significantly duplicate bus service within a corridor, no changes would be made. This approach was taken so as not to under-estimate costs associated with implementing streetcar service in a corridor. The goal of this phase of the operating plans is to compare corridors to each other rather than minimize operating cost estimates. In future phases of study—and even beyond the scope of this project—more detailed operating plans will be developed through coordination with Metro Transit staff for higher priority corridors. It should be noted that the proposed changes included in Metro Transit's *Central Corridor Transit Service Study Concept Plan (June 2012)* report are accounted for in this document.

## **Operating Costs**

Operating costs are initially developed using a fully loaded cost per revenue hour, which was calculated using running time (including 15% layover), number of vehicles, and span of service. Later in this study, operating costs will be based on a blended rate from three studies being conducted in the region at this time: Robert Street Transit Alternatives Study, Nicollet-Central Transit Alternatives, and the Midtown Corridor Alternatives Analysis. All three studies are coordinating to use a similar multi-factor model to estimate operating and maintenance costs for the different alternatives being evaluated. The multi-factor

model is more detailed that is required for a feasibility study, but is a more accurate method for estimating costs.

The methodology used for those three studies is to estimate streetcar operating costs as percentage of light rail operating costs (rather than percentage increase over bus operating costs). Therefore, data from the National Transit Database was used to develop a preliminary operating cost per revenue hour estimate. Based on data from Portland and Seattle, streetcar operating costs are on average 61% of operating costs per hour for light rail. Thus, 61% of the light rail costs per hour in the Twin Cities (which is \$380/revenue hour) multiplied by 61% equals **an estimated \$230.00 per revenue hour** for streetcar. These figures are summarized in the table below.

Figure 2. Peer City Operating Cost per Revenue Hour (Bus, Streetcar and Light Rail)

City	Operating Cost/Revenue Hour by Mode			Streetcar as...		Operating Costs	
	Bus	Streetcar	Light Rail	% of Bus	% of Light Rail	Bus	Light Rail
Twin Cities	\$124.00	n/a	\$379.96	-	-		
Portland	\$136.19	\$218.36	\$349.12	160%	62.5%	\$198.82	\$237.64
Seattle	\$148.75	\$208.26	\$345.45	140%	60%	\$173.61	\$229.06

Source: 2011 National Transit Database

## Operating Cost Evaluation

A summary of the operating cost estimates based on the conceptual operating plans is provided below in Figure 3. The Phase 2 corridors were then evaluated based on two factors related to operating costs:

- Total estimated operating cost in the corridor (less any potential savings in bus operating costs if streetcar were operating in the corridor)
- Total operating cost per route mile, which was calculated as the total operating cost divided by the route miles of the corridor.

For each factor, the corridors were organized into the top, middle and bottom tiers. The top tier (least cost) for each factor was given a rating of Best, the bottom tier (highest cost) was given a rating of Fair, and all other corridors (moderate cost) were given a Good rating. The rating for the two factors were then used to provide an overall rating, as shown below:

- **Best:** Two Best ratings or one Good and one Best rating
- **Good:** Two Good ratings or one Best and one Fair rating
- **Fair:** Two Fair ratings or one Good and one Fair rating

It is important to note that the evaluation in this section is different than the Integration with Existing Bus and High Capacity Transit Investments section, which is based on a qualitative assessment of how well each potential streetcar line integrates with existing services and future high capacity transit investments. The lines that scored well in this section, for example, may or may not score well in the Integration with Existing Bus and High Capacity Transit section.

The summary of the operating cost evaluation is shown below in Figure 3.

**Figure 3. Operating Costs Evaluation Summary**

Alternative	Streetcar Costs		Potential Reduction in Bus Operating Costs	Total Estimated Operating Costs	Operating Cost / Route Mile	Rating
	Annual Revenue Hours	Estimated Annual Operating Costs				
Arcade + Maryland	23,400	\$5,429,000	\$0	\$5,429,000	\$1,262,558	✓ Good
Cleveland	21,700	\$5,034,000	\$0	\$5,034,000	\$1,525,455	▲ Fair
E. 7th	19,900	\$4,617,000	\$0	\$4,617,000	\$1,442,813	▲ Fair
Grand + Cretin	41,000	\$9,512,000	\$1,959,200	\$7,552,800	\$1,063,775	✓ Good
Grand + Cleveland	38,100	\$8,839,000	\$0	\$8,839,000	\$1,299,853	▲ Fair
Lexington N	11,200	\$2,598,000	\$0	\$2,598,000	\$1,299,000	✓✓ Best
Lexington S	16,600	\$3,851,000	\$0	\$3,851,000	\$1,283,667	✓✓ Best
Payne	24,600	\$5,707,000	\$0	\$5,707,000	\$1,327,209	✓ Good
Raymond	11,200	\$2,598,000	\$0	\$2,598,000	\$1,528,235	✓ Good
Randolph + Ford	45,700	\$10,602,000	\$2,318,800	\$8,283,200	\$1,035,400	✓ Good
Rice	21,700	\$5,034,000	\$248,000	\$4,786,000	\$1,329,444	▲ Fair
Robert	16,600	\$3,851,000	\$0	\$3,851,000	\$1,481,154	✓ Good
Selby + Marshall	45,700	\$10,602,000	\$4,216,000	\$6,386,000	\$769,398	✓✓ Best
Selby + Snelling	30,300	\$7,030,000	\$0	\$7,030,000	\$865,556	✓✓ Best
Snelling N	16,600	\$3,851,000	\$0	\$3,851,000	\$1,540,400	✓ Good
Snelling S + Ford	30,300	\$7,030,000	\$1,140,800	\$5,889,200	\$1,132,538	✓✓ Best
Wabasha	10,300	\$2,390,000	\$0	\$2,390,000	\$1,257,895	✓✓ Best
W 7th	30,300	\$7,030,000	\$0	\$7,030,000	\$1,326,415	▲ Fair
W 7th + Ford Spur	41,000	\$9,512,000	\$0	\$9,512,000	\$1,285,405	▲ Fair
W 7th + Ford Spur (to 46th St. Station)	48,500	\$11,252,000	\$0	\$11,252,000	\$1,293,333	▲ Fair

## PAYNE

The Payne corridor begins in downtown St. Paul and extends to the northeast to serve the retail corridor along Payne Avenue. Only one primary Metro Transit route operates within this corridor:

- **Route 64** is a Hi Frequency route that is the primary transit route in this corridor and largely follows the same alignment. Route 64, however, continues via Maryland and then splits at Phalen Boulevard and Maryland Avenue into several branches. There is one short line on this route (64H) that operates to the Hillcrest Transit Station (on White Bear Avenue and Idaho Avenue), which is well beyond the terminus of this corridor.

### Conceptual Operating Plan

Because Route 64 extends high frequency service to Prosperity/Maryland intersection, it is proposed that streetcar operating in the Payne corridor also extend to Prosperity and Maryland via Maryland. Due to the round trip travel time, it is assumed that this route would terminate on or near Clarence Street just south of Maryland Avenue (or in this vicinity). The frequency and span of service would be the same as that assumed above. However, the frequency and service span would likely be expanded if modifications to the underlying bus system are made (see below). The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

No changes to Route 64 are assumed at this phase of study due to the complexity of Route 64 and multiple branches that travel well beyond the terminus of this corridor. However, closer evaluation of travel patterns on Route 64 could reveal the potential to terminate some trips at the terminus of this corridor (Maryland and Prosperity), resulting in less bus service in this corridor. It should be noted that with streetcar in this corridor and no changes to the underlying bus system, there would likely be more transit service than the market could support.

### Conceptual Streetcar Operating Costs (Payne)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
24,600	\$5,707,000	0	\$0	\$5,707,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## ARCADE + MARYLAND

The Arcade + Maryland corridor begins in downtown Saint Paul and terminates near the intersection of Maryland Avenue and Prosperity Avenue. Three Metro Transit routes operate in this corridor: 61, 74 and 64.

- **Route 61** connects downtown Saint Paul to downtown Minneapolis via three major streets: Arcade and Larpenteur (in Saint Paul) and Hennepin (in Minneapolis).
- **Route 64** is described above under the Payne corridor.
- **Route 74** operates from the 46<sup>th</sup> Street Station on the Blue Line (in Minneapolis) and generally travels via Ford Parkway, Cleveland, Randolph, W. 7<sup>th</sup> and E. 7<sup>th</sup> to before it branches out and terminates on the eastern side of St. Paul and Maplewood.

## Conceptual Operating Plan

As with the Payne corridor, streetcar service in this corridor would operate via 5<sup>th</sup> and 6<sup>th</sup> Streets in downtown St. Paul and continue eastbound via E. 7<sup>th</sup> Street. The route would then continue northeast on E. 7<sup>th</sup> Street, north on Arcade Street, and east on Maryland Avenue to terminate at the same location as the Payne corridor (near Clarence Street south of Maryland Avenue). The frequency of service in this corridor is assumed to be the same as that presented in the Overview section with the exception of 30 minute service in the early evening instead of 15 minute service on weekdays and Saturdays (based on existing bus service in this corridor).

## Potential Modifications to Existing Bus Routes

Because no bus service significantly duplicates service within this corridor, it is assumed that no bus service changes would be made with streetcar in this corridor.

## Conceptual Streetcar Operating Costs (Arcade + Maryland)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
23,400	\$5,429,000	0	\$0	\$5,429,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## EAST 7TH

As with the Payne and Arcade + Maryland corridors, the E. 7<sup>th</sup> corridor begins in downtown Saint Paul but continues via E. 7<sup>th</sup> to Johnson Parkway. Two Metro Transit routes operate in this corridor - 61 and 74 – both of which are described in the Arcade + Maryland corridor.

## Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate via 5<sup>th</sup> and 6<sup>th</sup> Streets in downtown St. Paul and continue eastbound via E. 7<sup>th</sup> Street to Johnson Parkway. While no specific terminus or turn-around location has been identified, there are several options for terminating and laying over in this vicinity. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

## Potential Modifications to Existing Bus Routes

Because Route 74 continues beyond this corridor and serves a larger regional market, it is assumed that no bus service changes would be made with streetcar in this corridor.

## Conceptual Streetcar Operating Costs (E 7<sup>th</sup>)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
19,900	\$4,617,000	0	\$0	\$4,617,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## ROBERT STREET

The Robert Street corridor begins in downtown Saint Paul and continues south through the West Side neighborhood generally via Robert Street to the city limits at Annapolis Street. Two Metro Transit routes operate in this corridor: Routes 68 and 71.

- **Route 68** operates from the North End neighborhood (generally along Jackson Street) south through downtown and then south through the West Side via Robert and State Street. South of Saint Paul, Route 68 has multiple branches that serve West St. Paul, South St. Paul and Inver Grove Heights.
- **Route 71** is a long route that at the Little Canada Transit Center, traverses the Payne-Phalen neighborhood (via several corridors including Edgerton and Westminster) and downtown St. Paul before continuing south generally via Robert Street and Cesar Chavez (Concord) Street before terminating in Inver Grove Heights.

### Conceptual Operating Plan

The feasibility of streetcar service in this corridor will ultimately be decided by the ongoing *Robert Street Transitway Alternatives Study*. This study is currently evaluating a number of potential alignment and modal options, including streetcar in the Robert Street corridor. The potential alignment for streetcar in this study extends from downtown St. Paul to Northern Service Center on Mendota Road in West St. Paul, just west of Robert Street. The streetcar alignment being studied would follow the alignment in St. Paul that is described below.

If this corridor were to be a priority corridor as part of this Phase 2 evaluation, it should be noted that the *Robert Street Transitway Alternatives Study* extended service much further south (to Mendota Road in West St. Paul). However, for the purposes of this analysis, streetcar service in this corridor would conceptually operate from downtown St. Paul via 5<sup>th</sup> and 6<sup>th</sup> Streets and continue south via Robert Street, Cesar Chavez Street, and State Street before continuing south on Robert Street to the city limits (Annapolis Street). The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

Although Route 68 operates within this corridor, it is a long route with multiple branches and thus serves a larger regional market. Thus, for this phase of analysis it is assumed that no bus service changes would be made with streetcar in this corridor. As noted above, any determination about bus modifications would be decided at a later date through the *Robert Street Transitway Alternatives Study*. It should be noted that with streetcar in this corridor and no changes to the underlying bus system, there would likely be more transit service than the market could support.

### Conceptual Streetcar Operating Costs (Robert Street)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
16,600	\$3,851,000	0	\$0	\$3,851,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## WABASHA

The Wabasha Street corridor begins in downtown Saint Paul and continues south via Wabasha Street and Humboldt Avenue. Two Metro Transit routes operate in this corridor: Routes 67 and 75.

- **Route 67** starts at Prior Avenue and I-94 in St. Paul and serves the Hamline-Midway and Thomas-Dale neighborhoods (mostly via Minnehaha) before continuing into downtown St. Paul. From here, the route continues south to the West Side via Wabasha, Humboldt, Winifred, George, and Smith Avenue before terminating in West St. Paul. It should be noted that major changes are recommended for this route as part of the restructuring around the Green Line, including consolidation with Route 8 and termination of the Route 67 service south of downtown. The service south of downtown would become part of Route 62.
- **Route 75** begins in downtown St. Paul via Wabasha and Cedar Streets and serves the West Side of St. Paul via Wabasha, Humboldt, George and Stryker before continuing south via multiple branches to West St. Paul, Inver Grove Heights and Mendota Heights.

### Conceptual Operating Plan

Streetcar service in the Wabasha corridor would conceptually operate from downtown via St. Peter (southbound) and Wabasha (northbound) Streets, continue across the Wabasha bridge to the West Side. From here, the route would continue via Humboldt Avenue and terminate several blocks south of George Street to serve the Humboldt Junior High School. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section with the exception of 30 minute service in the early evening instead of 15 minute service on weekdays and Saturdays (based on existing bus service in this corridor).

### Potential Modifications to Existing Bus Routes

Because there is no significant duplication between bus service and the conceptual streetcar service in this corridor, so it is assumed that no bus service modifications would be made.

### Conceptual Streetcar Operating Costs (Wabasha)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
10,300	\$2,390,000	0	\$0	\$2,390,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## WEST 7TH

The West 7<sup>th</sup> corridor would start in downtown St. Paul and continue southwest via W. 7<sup>th</sup> Street with a terminal location at the Mall of America. A number of bus routes use the northern part of W. 7<sup>th</sup> Street to serve other corridors in St. Paul (such as Route 70 that serves St. Clair Avenue and Route 74 that serves Randolph Avenue), but the primary bus route that operates in the corridor is Route 54.

- Route 54 is a limited stop route that begins in downtown St. Paul (using 5<sup>th</sup> and 6<sup>th</sup> Streets) and serves the entire W. 7<sup>th</sup> corridor before connecting to the MSP airport and eventually Mall of America. This route is a Hi-Frequency route that operates every 15 minutes or better during most of the day on weekdays and Saturday.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate along the same alignment as Route 54 – starting in downtown St. Paul using 5<sup>th</sup> and 6<sup>th</sup> Streets and serving the entire W. 7<sup>th</sup> Street corridor. However, there are challenges with operating streetcar beyond the city limits. At Edgumbe Road, W. 7<sup>th</sup> (Highway 5) converts to a limited access roadway with a 55 mph speed limit. Thus, it is assumed that any streetcar service in this corridor would terminate before this point – likely in the vicinity of Davern Street. There are several good opportunities to turn around and layover a streetcar in this vicinity. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

No changes to Route 54 are assumed at this phase of study due to the important connections outside of the corridor (to MSP and the Mall of America). However, closer evaluation of travel patterns on Route 54 could reveal the potential to operate fewer trips along the entire length of the route and allowing for higher frequency service just within St. Paul. This could potentially result in less bus service in this corridor and cost savings. It should be noted that with streetcar in this corridor and no changes to the underlying bus system, there would likely be more transit service than the market could support.

### Conceptual Streetcar Operating Costs (W 7<sup>th</sup>)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
30,300	\$7,030,000	0	\$0	\$7,030,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## WEST 7<sup>TH</sup> + FORD SPUR

The West 7<sup>th</sup> + Ford Spur corridor would be very similar to the W. 7<sup>th</sup> Street corridor but extend via the Ford rail spur to serve more of the Highland neighborhood. In addition to Route 54 that is the primary bus route on W 7<sup>th</sup> Street (described above under the W. 7<sup>th</sup> corridor), two other routes provide service on the western end of the corridor:

- Route 84** is the primary route serving Snelling Avenue and connects the Rosedale Transit Center with the Highland neighborhood and the 46<sup>th</sup> Street Station on the Blue Line in Minneapolis. Route 84 has a branch that continues south from Ford Parkway via St. Paul Avenue and terminates south of W. 7<sup>th</sup> Street on Davern Street.



- **Route 46** starts in Edina and travels via 50<sup>th</sup>, 46<sup>th</sup> and 42<sup>nd</sup> Streets in south Minneapolis before serving the 46<sup>th</sup> Street Station and continuing into St. Paul via Ford Parkway. The route then continues south on Cleveland, Sheridan and St. Paul Avenues before terminating near W. 7<sup>th</sup> Street and St. Paul Avenue.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate along the same alignment as the W. 7<sup>th</sup> Street corridor but then continue via the Ford rail spur to the old Ford plant (or some other terminus in the Highland neighborhood). This alignment assumes that streetcar could operate on the Ford rail spur and that the Ford site would develop in a way that is supportive of streetcar. The Ford site has been identified as an opportunity site for either mixed-used development or an employment center.

The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

As noted above in the W. 7<sup>th</sup> Street corridor, there are opportunities to modify Route 54 service between downtown and the south end of the corridor. With the Ford Spur in place, and if this corridor were extended to the 46<sup>th</sup> Street station (via Ford Parkway and 46<sup>th</sup> Street), the segment of Route 46 east of the 46<sup>th</sup> Street Station could be terminated.

### Conceptual Streetcar Operating Costs (W 7<sup>th</sup> + Ford Spur): Downtown to Ford Parkway

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
41,000	\$9,512,000	0	\$0	\$9,512,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

### Conceptual Streetcar Operating Costs (W 7<sup>th</sup> + Ford Spur): Downtown to 46<sup>th</sup> Street Station

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
48,500	\$11,252,000	0	\$0	\$11,252,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## RANDOLPH + FORD PARKWAY

The Randolph + Ford Parkway corridor would start in downtown St. Paul and travel via W. 7<sup>th</sup> Street to Randolph Street, Cleveland Avenue and Ford Parkway before terminating at the 46<sup>th</sup> Street Station in Minneapolis. While multiple bus routes operate on segments of this corridor, the primary route is Route 74.

- **Route 74** operates from the 46<sup>th</sup> Street Blue Line Station (in Minneapolis) and generally travels via Ford Parkway, Cleveland, Randolph, W. 7<sup>th</sup> and E. 7<sup>th</sup> to before it branches out and terminates on the eastern side of St. Paul and Maplewood.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate on 5<sup>th</sup> and 6<sup>th</sup> Streets in downtown St. Paul, continue via W. 7<sup>th</sup> Street and then turn west on Randolph Street. The route would continue on Randolph to Cleveland, continue south to Ford Parkway and then west on Ford Parkway/46<sup>th</sup> Street to the 46<sup>th</sup> Street Station. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

Because the conceptual streetcar alignment largely duplicates Route 74 from the 46<sup>th</sup> Street Station to downtown St. Paul, there is potential for replacing this segment of Route 74 with streetcar. If this were to be a priority streetcar corridor, additional analysis would be recommended to determine if travel patterns on Route 74 would be conducive to shortening the route and replacing this segment with streetcar. Potential costs associated with this change are provided below.

### Conceptual Streetcar Operating Costs (Randolph + Ford Parkway)

Estimated Route 74 savings are summarized below:

- Weekday (56 weekday round trips @ 60 minutes) = 56 weekday hours
- Saturday (49 Saturday round trips @ 60 minutes) = 49 Saturday hours
- Sunday (32 Sunday round trips @ 60 minutes) = 32 Sunday Hours
- 56 weekday hours \* 255 weekdays + 49 Saturday hours \* 52 Saturdays + 32 Sunday hours \* 58 Sundays & holidays ~ = 18,700 annual revenue hours

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
45,700	\$10,602,000	18,700	\$2,319,000	\$8,283,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## GRAND + CRETIN

The Grand + Cretin corridor would start in downtown St. Paul and travel via W. 7<sup>th</sup> Street to Grand Avenue, continue north on Cretin Avenue and terminate at University. While multiple bus routes operate on segments of this corridor, the primary route is Route 63.

- **Route 63** operates from Grand and Cretin (on the University of St. Thomas campus) to downtown St. Paul via Grand and Smith Avenues. The route then continues east via Kellogg Boulevard and E. 3<sup>rd</sup> Street before terminating in several branches on the east side of St. Paul. This route will be extended to the Raymond Avenue Station via Cretin Avenue when the Green Line opens.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate on 5<sup>th</sup> and 6<sup>th</sup> Streets in downtown St. Paul, continue via W. 7<sup>th</sup> Street and then turn west on Grand Avenue. The route would then continue north on Cretin to University Avenue. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

Because the conceptual streetcar alignment largely duplicates the segment of Route 63 that operates from downtown via Grand Avenue to Cretin, there is a strong possibility that this segment of Route 63 could be replaced by streetcar. This is also true when changes to Route 63 are made when the Green Line opens. If the Grand + Cretin corridor were to be a priority streetcar corridor, additional analysis would be recommended to determine if travel patterns on Route 63 would be conducive to eliminating this segment of the route and replacing it with streetcar. Potential revenue hours associated with this change are provided below.

### Conceptual Streetcar Operating Costs (Grand + Cretin)

Estimated Route 63 savings are provided below.

- Weekday (50 weekday round trips @ 60 minutes) = 50 weekday hours
- Saturday (37 Saturday round trips @ 60 minutes) = 37 Saturday hours
- Sunday (19 Sunday round trips @ 60 minutes) = 19 Sunday Hours
- 50 weekday hours \* 255 weekdays + 37 Saturday hours \* 52 Saturdays + 19 Sunday hours \* 58 Sundays & holidays ≈ 15,800 annual revenue hours

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
41,000	\$9,512,000	15,800	\$1,959,000	\$7,553,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## GRAND + CLEVELAND

The Grand + Cleveland corridor would be identical to the Grand + Cretin corridor except the route would travel north via Cleveland and terminate at University. Likewise, the primary bus route that operates on this corridor is Route 63. Route 87 also operates in the Cleveland corridor from Ford Parkway to the Rosedale Transit Center. When the Green Line opens, Route 87 will have improved frequency and be rerouted to better serve the Raymond Avenue station on University Avenue.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate on 5<sup>th</sup> and 6<sup>th</sup> Streets in downtown St. Paul, continue via W. 7<sup>th</sup> Street and then turn west on Grand Avenue. The route would then continue north on Cleveland to University Avenue. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

## Potential Modifications to Existing Bus Routes

Although this conceptual streetcar alignment largely duplicates the segment of Route 63 that operates from downtown via Grand Avenue, Route 63 continues to Cretin Avenue and St. Thomas University – a strong anchor on this corridor. While it is possible that some service on Route 63 could be reduced, it is assumed for this conceptual operating plan that no changes to the underlying bus system would be made. It should be noted that with streetcar in this corridor and no changes to the underlying bus system, there would likely be more transit service than the market could support.

## Conceptual Streetcar Operating Costs (Grand + Cleveland)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
38,100	\$8,839,000	0	\$0	\$8,839,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## SELBY + MARSHALL

The Selby + Marshall corridor would start in the 5<sup>th</sup> and 6<sup>th</sup> Street corridor in downtown St. Paul, serve portions of Selby and Marshall. Rather than terminate at Cretin (the last major street in St. Paul), a likely terminal location would be the Lake/Midtown Station in Minneapolis, which is about 1.75 miles to the west (outside of the city limits). The primary bus routes in this corridor are Routes 21 and 53.

- Route 21 operates from downtown St. Paul (using 5<sup>th</sup> and 6<sup>th</sup> Streets) to the Uptown Transit Center in Minneapolis. In St. Paul, the route operates via Selby, Hamline, University, Snelling and Marshall. This route is a Hi-Frequency route west of Cretin, where a branch starts from Summit/Finn.
- Route 53 is a limited stop route that operates from downtown St. Paul to the Uptown Transit Center in Minneapolis. In St. Paul, Route 53 operates non-stop on I-94 to Snelling, where it then turns south on Snelling and west on Marshall and operates on the same alignment as Route 21 to the Uptown Transit Center (but with limited stops).

## Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate on 5<sup>th</sup> and 6<sup>th</sup> Streets in downtown St. Paul, travel north on Kellogg and John Ireland to Selby. From here, the route would continue on Selby to Snelling where it would turn north for two blocks and then continue west on Marshall. Rather than terminate in the city limits, a stronger (and more logical) terminal location would be the Lake/Midtown Station LRT station in Minneapolis.

## Potential Modifications to Existing Bus Routes

Because the conceptual streetcar alignment largely duplicates Route 21 from downtown St. Paul to the Lake/Midtown station in Minneapolis, there is potential for replacing the St. Paul segment of Route 21 with streetcar (from downtown to Lake/Midtown Station). If this were to be a priority streetcar corridor, additional analysis would be recommended to determine if travel patterns on Route 21 would be conducive to shortening the route and replacing the St. Paul segment with streetcar (especially because Route 21 makes a deviation to University). Potential costs associated with this change are provided below. It is assumed that no changes to Route 53 would be made.

## Conceptual Streetcar Operating Costs (Selby + Marshall)

Estimated Route 21 savings are provided below.

- Weekday (66 weekday round trips, varying times) = 102 weekday hours
- Saturday (56 Saturday round trips, varying times) = 83 Saturday hours
- Sunday (47 Sunday round trips, varying times) = 65 Sunday Hours
- 102 weekday hours \* 255 weekdays + 83 Saturday hours \* 52 Saturdays + 65 Sunday hours \* 58 Sundays & holidays ~ = 34,000 annual revenue hours

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
45,700	\$10,602,000	34,000	\$4,216,000	\$6,386,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## SELBY + SNELLING

This corridor would be identical to the Selby + Marshall corridor from downtown to Selby and Snelling with the exception that the route would travel north via Snelling and terminate at University. Likewise, the primary bus route that operates on this corridor is Route 21 (Route 53 does provide some service in this corridor but very peripherally).

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate on 5<sup>th</sup> and 6<sup>th</sup> Streets in downtown St. Paul, continue via Kellogg and John Ireland to Selby and continue west on Selby to Snelling. The route would then continue north on Snelling to University Avenue where a connection to the Green Line would be made. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

As with the Selby + Marshall corridor, this corridor largely duplicates Route 21. But, it also makes the deviation to University (that the Selby + Marshall corridor does not do), which makes potential replacement of Route 21 service in St. Paul even more feasible. If this were to be a priority streetcar corridor, additional analysis would be recommended to determine if travel patterns on Route 21 would be conducive to shortening the route and replacing the St. Paul segment with streetcar. Potential costs associated with this change are provided below.

## Conceptual Streetcar Operating Costs (Selby + Snelling)

Estimated Route 21 savings are summarized below.

- Weekday (64 weekday round trips, 40-60 minutes round trip) = 59 weekday hours
- Saturday (55 Saturday round trips, 40-60 minutes round trip) = 48 Saturday hours
- Sunday (47 Sunday round trips, varying times) = 29 Sunday Hours

- 59 weekday hours \* 255 weekdays + 48 Saturday hours \* 52 Saturdays + 29 Sunday hours \* 58 Sundays & holidays ~ = 19,000 annual revenue hours

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
30,300	\$7,030,000	19,000	\$2,356,000	\$4,674,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## LEXINGTON SOUTH

The Lexington South corridor would serve Lexington Parkway between University Avenue and W. 7<sup>th</sup> Street. With the exception of Route 74 that provides service on limited trips for a short portion of Lexington Avenue, there is no existing bus service that operates within this corridor. However, when the Green Line opens, a new route (Route 83), would be introduced on Lexington Avenue from W. 7<sup>th</sup> to Lexington and Energy Park Drive. This route would then continue via Energy Park Drive to Snelling and Como. Service on this route would be every 30 minutes on weekdays and weekends.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate as a crosstown route that connects W. 7<sup>th</sup> Street to the Green Line on University Avenue. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

Because there is no significant duplication between existing bus service and the conceptual streetcar in this corridor, it is assumed that no modifications would be made. However, if this were to be a priority streetcar corridor, some modifications to the new Route 83 may be possible.

### Conceptual Streetcar Operating Costs (Lexington South)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
16,600	\$3,851,000	0	\$0	\$3,851,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## SNELLING + FORD PARKWAY

The Snelling + Ford Parkway corridor would start at the Snelling station on the Green Line and continue via Snelling and Ford Parkway to the 46<sup>th</sup> Street Station on the Blue Line in Minneapolis. While multiple routes operate within this corridor (21, 23, 46, 74, 84 and 144), Routes 84 and 144 are the two primary bus routes that operate in this corridor.

- **Route 84** is the primary route serving Snelling Avenue and connects the Rosedale Transit Center with the Highland neighborhood and the 46<sup>th</sup> Street Station on the Blue Line in Minneapolis. Route 84 has a branch that continues south from Ford Parkway via St. Paul Avenue and

terminates south of W. 7<sup>th</sup> Street on Davern Street. This route is a Hi-Frequency route from Ford Parkway to the Rosedale Transit Center. When the Green Line opens in 2014, service frequency on this route will be improved north of Ford Parkway. This corridor is also planned as Metro Transit’s first Bus Rapid Transit line that would be operational in 2015.

- **Route 144** is a limited stop route that starts in the Highland neighborhood serves Snelling Avenue to I-94 where it continues west to the U of M Minneapolis campus and downtown Minneapolis. This route is recommended for elimination when the Green Line opens in 2014.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate from the 46<sup>th</sup> Street Station on the Blue Line to the Snelling Station on the Green Line. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

In 2015, Metro Transit plans to implement Bus Rapid Transit (BRT) in the Snelling and Ford Parkway corridor, which would be the first such service in the Twin Cities (see this website for more detail: [metrotransit.org/snelling-brt](http://metrotransit.org/snelling-brt)). When this occurs, the existing Route 84 with local stops would remain but provide service less frequently. It was noted in the Arterial Transitway Corridors Study that 75% of boardings on Route 84 occur at one of the proposed stops along the BRT line (spaced about every ½ mile), indicating limited demand for short, local trips that are more suitable for streetcar. If streetcar were implemented in a portion of this corridor, it could potentially replace some service on Route 84, but this was not assumed as part of this operating plan due to planned improvements in the corridor.

### Conceptual Streetcar Operating Costs (Snelling + Ford Parkway)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
30,300	\$7,030,000	0	\$0	\$7,030,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## CLEVELAND

The Cleveland corridor would start at Ford Parkway and continue north to terminate at University Avenue and the Green Line. Two existing bus routes (Routes 87 and 134) operate in this corridor:

- **Route 87** starts at Ford Parkway and Cleveland and continues north via Cleveland, University and Raymond to the University of Minnesota St. Paul campus. The route then continues north via Gortner Avenue, Larpenteur and Fairview Avenue to the Rosedale Transit Center.
- **Route 134** starts at the same location as Route 87 (Ford Parkway and Cleveland) but serves downtown Minneapolis. The route runs on Cleveland, Summit and Cretin before getting on I-94 and operating non-stop to downtown Minneapolis (terminating at the 7<sup>th</sup> Street Garage).

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate as a crosstown route that connects the Highland neighborhood with the Green Line on University Avenue. The route would operate exclusively

on Cleveland Avenue. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

Although Routes 87 and 134 operate in this corridor, both routes serve a larger market beyond this corridor and are therefore not recommend for changes. However, service within this corridor with streetcar at proposed levels would likely be greater than is justified by demand.

### Conceptual Streetcar Operating Costs (Cleveland)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
21,700	\$5,034,000	0	\$0	\$5,034,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## RAYMOND

The Raymond corridor would start at University Avenue and continue north to the University of Minnesota St. Paul campus. One primary bus route operates within this corridor – Route 87 – which was described under the Cleveland corridor.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate as a crosstown route that connects University Avenue to the U of M St. Paul campus. The route would operate on Raymond on the southern end of the corridor and Cleveland on the north end of the corridor (until Buford Avenue) where the route would turn east and terminate on the U of M campus. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

Although Route 87 operates in this corridor, Route 87 serves a larger market beyond this corridor and is therefore not recommend for changes. However, service within this corridor with streetcar at proposed levels would likely be greater than is justified by demand.

### Conceptual Streetcar Operating Costs (Raymond)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
11,200	\$2,598,000	0	\$0	\$2,598,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## SNELLING NORTH

The Snelling North corridor would start at the Snelling Station on the Green Line and continue north to Midway Parkway and terminate in Como Park. The primary route operating in this corridor is Route 84, which was described under the Snelling + Ford Parkway corridor.



## Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate on Snelling Avenue and Midway Parkway and terminate either on Midway Parkway or Estebrook Drive in Como Park. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

## Potential Modifications to Existing Bus Routes

Although this route would duplicate service on Route 84, it only does so for a relatively short segment of the route and Route 84 serves a different market. Because there is no significant duplication between bus service and the conceptual streetcar service in this corridor, it is assumed that no bus service modifications would be made.

## Conceptual Streetcar Operating Costs (Snelling North)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
16,600	\$3,851,000	0	\$0	\$3,851,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## LEXINGTON NORTH

The Lexington North corridor would start at the Lexington Station on the Green Line and continue north to terminate in Como Park. There are a number of bus lines that cross Lexington Parkway, but there is no existing bus service operating within the corridor. However, as noted in the Lexington South corridor, the new Route 83 is planned for this corridor.

## Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate as a crosstown route that connects the Green Line on University Avenue to Como Park. The route would mostly operate on Lexington Parkway but make a terminal loop via Estebrook, Alda Place and Nason Place. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

## Potential Modifications to Existing Bus Routes

Because there is no significant duplication between bus service and the conceptual streetcar service in this corridor, it is assumed that no bus service modifications would be made. However, if this were to be a priority streetcar corridor, some modifications to the new Route 83 may be possible.

## Conceptual Streetcar Operating Costs (Lexington North)

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
11,200	\$2,598,000	0	\$0	\$2,598,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## RICE

The Rice corridor would start in downtown St. Paul and continue north (mostly via Rice) north to the city limits (at Larpenteur). There are two primary bus routes that operate in this corridor – Routes 3 and 62.

- **Route 3** starts south of downtown St. Paul (in the West End), serves downtown St. Paul via Wabasha and St. Peter, and then continues north via Rice Street. One branch of the route splits at Como Avenue and Rice Street, while the other branch splits at Maryland Avenue and Como Street. Route 3 eventually terminates in downtown Minneapolis and also serves the University of Minnesota (Minneapolis campus).
- **Route 62** starts in downtown St. Paul (via Cedar and Wabasha) and is the primary route serving the entire Rice Street corridor in St. Paul. The route eventually terminates in Shoreview.

### Conceptual Operating Plan

Streetcar service in this corridor would conceptually operate via the Wabash and St. Peter couplet in downtown St. Paul and then continue north via East 12<sup>th</sup> Street to Rice Street. As with a branch of the existing Route 62, the conceptual streetcar line would terminate at Larpenteur. The frequency of service in this corridor is assumed to be the same as that presented in the Overview section.

### Potential Modifications to Existing Bus Routes

Although this conceptual streetcar line would duplicate Route 62 on Rice Street, most trips of Route 62 continue north of St. Paul and are serving a larger regional market. Several of the early morning and late evening trips, however, terminate at Larpenteur and could clearly be replaced by streetcar. If this were to be a priority streetcar corridor, additional analysis would be recommended to determine if travel patterns on Route 62 would be conducive to shortening the route and replacing the St. Paul segment with streetcar (especially since ridership drops off significantly north of the city limits). No changes are suggested for Route 3 since it serves a different market. Potential costs associated with the possible change to Route 62 are provided below.

### Conceptual Streetcar Operating Costs

Estimated Route 62 savings are summarized below.

- Weekday (6 weekday round trips, 35-38minutes round trip) = 4 weekday hours
- Saturday (22 Saturday round trips, 34-38 minutes round trip) = 7 Saturday hours
- Sunday (18 Sunday round trips, 34-38 minutes round trip) = 11 Sunday Hours
- 4 weekday hours \* 255 weekdays + 7 Saturday hours \* 52 Saturdays + 11 Sunday hours \* 58 Sundays & holidays ~ = 2,000 annual revenue hours

Annual Streetcar Revenue Hours	Estimated Annual Streetcar Operating Costs <sup>1</sup>	Potential Reduction in Bus Revenue Hours	Potential Bus Operating Cost Savings <sup>2</sup>	Estimated Total Operating Costs
21,700	\$5,034,000	2,000	\$248,000	\$4,786,000

1. Assumes \$230.00 per revenue hour

2. Assumes \$124.00 per revenue hour, based on 2011 National Transit Database

## Capital Costs

This section provides an estimate of the capital costs related to the construction of the streetcar. This includes engineering, utilities, structures, stations, traction power and communication systems, vehicles, fare collection equipment, rights-of-way, professional services, and contingencies. The estimate uses the Federal Transit Administration Standard Cost Category (SCC) format, which documents each of the projects that sum to the total cost. The costs were estimated in both the current year (2013) as well as in the year of expenditure (YoE), and are based on historic cost data of similar streetcar projects.

## Initial Screening

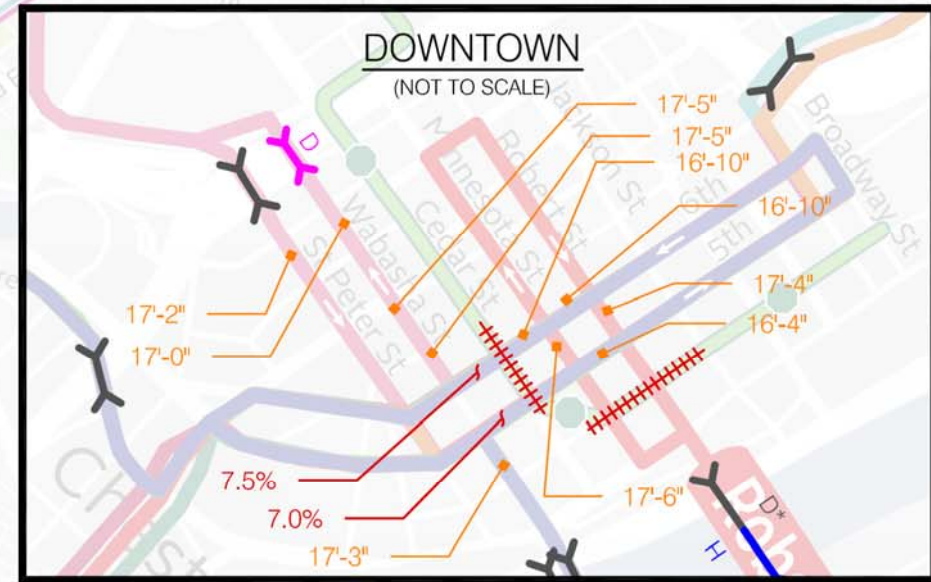
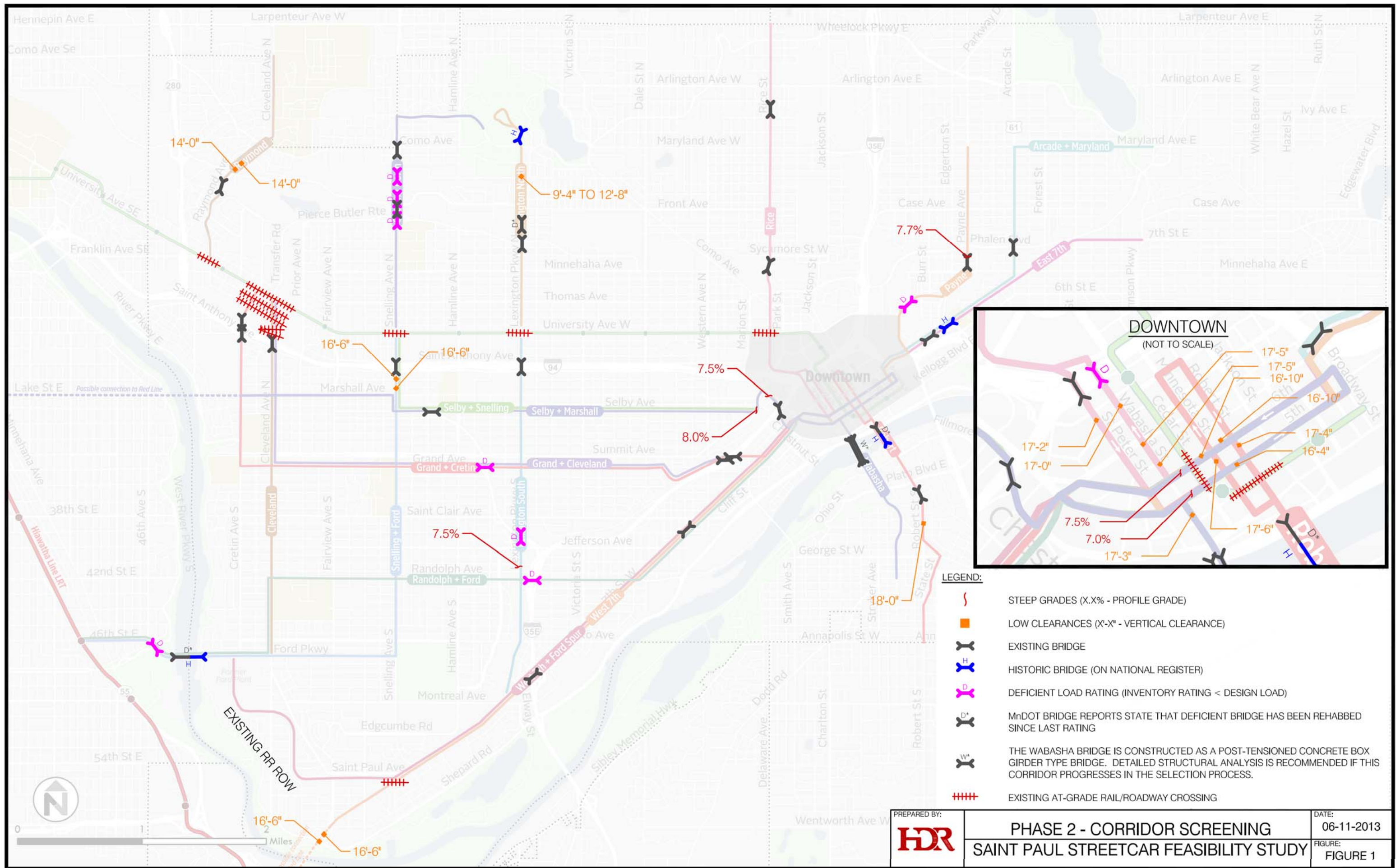
Similar to Phase 1, the Phase 2 Corridors were screened for potential fatal flaws in the corridor that would preclude or make the development of streetcar service prohibitively expensive. Figure 1 demonstrates such potential barriers.

## Methodology

The capital cost estimates include items related to vehicles, engineering, and construction. Additionally, the costs include provisions for public agency allowances, project management and administration, construction management, community relations and involvement, insurance/legal, start up and testing, and training. Because the level of design is still pre-conceptual, most of the items in the cost estimates are represented as allowances, which in effect act as a “place-holder” until further analysis and design identify quantifiable items needed to develop a more accurate cost estimate. These allowances are based on experience developing and implementing projects in other cities, historical data, and the engineer’s professional judgment.

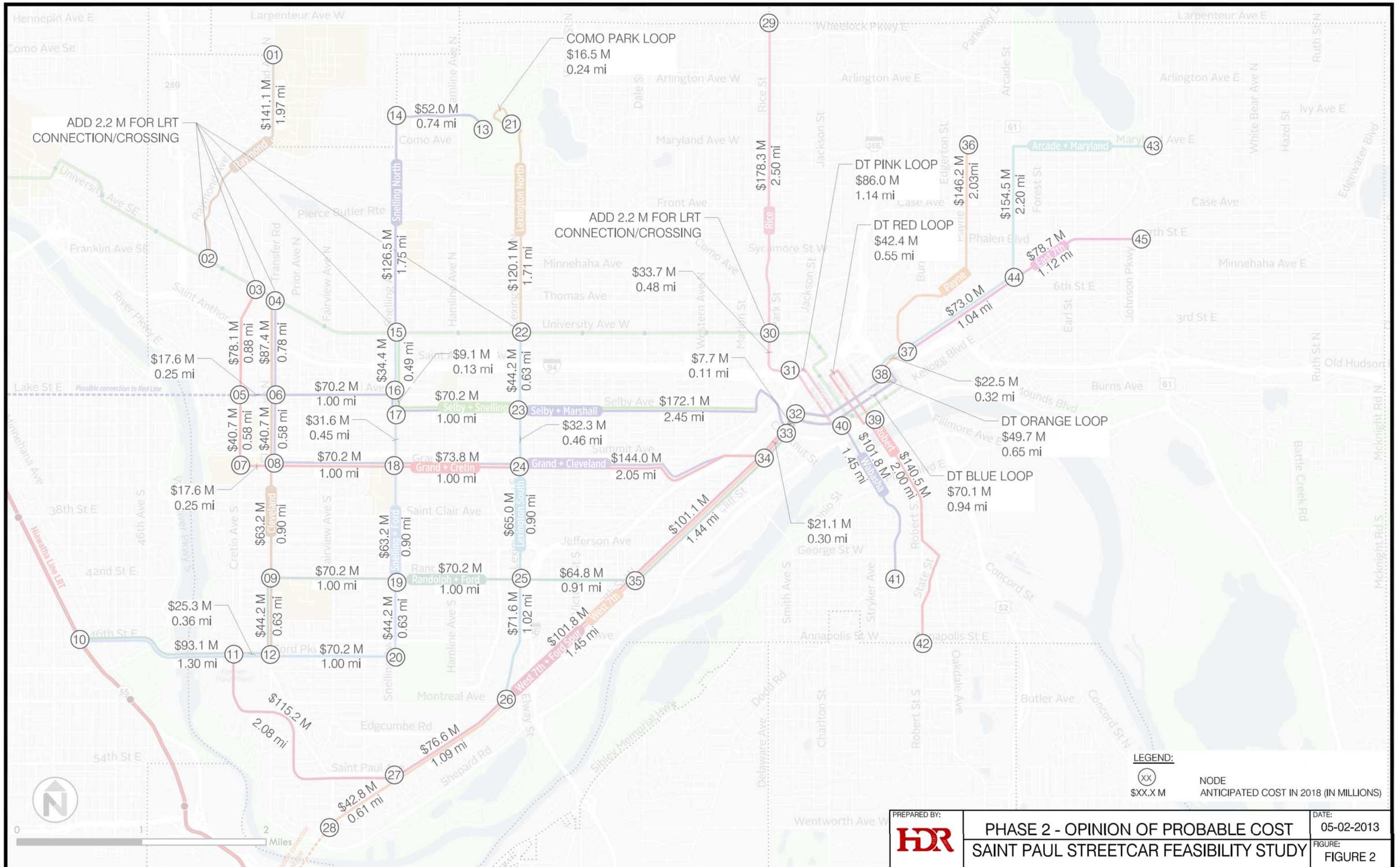
Estimates of project capital costs were developed in four general steps:

1. The routes were first broken into segments with common end points (nodes) as shown in Figure 2. This figure illustrates the Opinion of Project Costs broken down by segments including their approximate length and cost to construct in year 2018.
2. The individual project components needed for the desired level of design were identified and quantified for each segment, factoring in the results from the Phase 2 initial screening.
3. Unit costs or allowances for each of the project components documented in Step 2 were developed for each of the cost components based on industry standards, HDR’s past project experience and other project-specific factors. These cost components were assembled in a spreadsheet, where the unit costs/allowances were applied to the number of components that were needed.
4. Additional factors such as contingencies, engineering & administration, and year-of-expenditure escalation were added to the cost estimates.



- LEGEND:**
- STEEP GRADES (X.X% - PROFILE GRADE)
  - LOW CLEARANCES (X'-X" - VERTICAL CLEARANCE)
  - EXISTING BRIDGE
  - HISTORIC BRIDGE (ON NATIONAL REGISTER)
  - DEFICIENT LOAD RATING (INVENTORY RATING < DESIGN LOAD)
  - MnDOT BRIDGE REPORTS STATE THAT DEFICIENT BRIDGE HAS BEEN REHABBED SINCE LAST RATING
  - THE WABASHA BRIDGE IS CONSTRUCTED AS A POST-TENSIONED CONCRETE BOX GIRDER TYPE BRIDGE. DETAILED STRUCTURAL ANALYSIS IS RECOMMENDED IF THIS CORRIDOR PROGRESSES IN THE SELECTION PROCESS.
  - EXISTING AT-GRADE RAIL/ROADWAY CROSSING





**LEGEND:**  
 (XX) NODE  
 \$XX.X M ANTICIPATED COST IN 2018 (IN MILLIONS)



PREPARED BY: 	PHASE 2 - OPINION OF PROBABLE COST	DATE: 05-02-2013
	SAINT PAUL STREETCAR FEASIBILITY STUDY	FIGURE: FIGURE 2

## FTA Standard Cost Category Format (SCC)

The capital cost estimates use FTA's Standard Cost Category (SCC) format, which is a consistent format for reporting, estimating, and managing capital costs under FTA's New Starts program.

The SCC format is divided into three levels. The first level lists the ten main SCC categories: the guideway/track elements, stations, supporting facilities, sitework, operational systems, land, vehicles, professional services, unallocated contingency, and financing. The second level contains the SCC sub-categories, which focuses on components and tasks within the main SCC categories. Finally, a third level expands the sub-categories into each individual units of work, providing a level of detail more appropriate for unit pricing. As necessary, the estimate can roll these levels up into a cost summary using the SCC format for reporting purposes.

Capital costs for the first seven categories, which includes construction, rights-of-way costs, and vehicles (SCC 10-70), were calculated by using "order of magnitude" unit costs (since the price changes based on the number of units) and the measured quantities for each component. In contrast, system-wide costs and allowances were calculated based on route length, and not from measured quantities. A per track (or route) -mile unit cost was developed from historical data and applied to the alignment length. The final three categories, which includes professional services, contingencies, and finance (SCC 80-100), were calculated as a percentage of construction costs (excluding vehicle procurement).

The following section provides an overview of the components on which the SCC formatting is based:

- **Construction (SCC 10-50)** – The construction cost of the project, which consists of SCC sections 10 through 50, includes all capital improvement costs for the streetcar project. This includes all track, civil, stations, maintenance and administration buildings, systems and contractor indirects. This section includes line-item contingencies (allocated) typically ranging from 20-30% to account for uncertainty in quantity and/or price for that particular item.
- **Right-of-Way (SCC 60)** – This cost component includes the anticipated right-of-way costs for the project. For a streetcar, the right-of-way costs are typically limited to the maintenance facility, substations, and an occasional encroachment for a streetcar stop or making 90-degree turns. At this stage of project development, the right-of-way costs assumed are an allowance.
- **Vehicles (SCC 70)** – This cost component includes the costs for procuring modern streetcar vehicles and spare parts. The cost is based off recent pricing of streetcar vehicle procurements and assumes a federally funded project where vehicles must meet Buy America requirements. It also includes an estimated cost for consultant services for such vehicle procurement. Small orders, which are usually seen with starter streetcar projects, drive up the per-unit cost over larger orders typical of larger light rail systems.
- **Allocated Contingency (SCC 10-70)** – Contingency is typically included to address uncertainties based on the current level of engineering design. The contingency allowance addresses the potential for quantity fluctuations and cost variability when items of work are neither readily apparent nor known at the current level of design. Allocated contingencies are line-item contingencies applied to each item in SCC sections 10 through 70 (all construction, right-of-way costs, and vehicles components). Based on the limited level of design during Phase 2 of the Feasibility Study, an allocated contingency, generally in the range of 20-30 percent, was applied to the items in cost categories 10-70. The percentage selected was based on professional experience and judgment related to the potential variability of costs within each of these cost categories.
- **Professional Services (SCC 80)** – This category includes all professional, technical and management services related to the design and construction of fixed infrastructure (SCC 10–50) during the preliminary engineering, final design, and construction phases of the project. This includes, but is not limited to: design, engineering and architectural services, specialty services

such as safety or security analyses, value engineering, risk assessment, cost estimating, scheduling, Before and After studies, auditing, legal services, administration and management. As a percentage of construction costs (SCC 10-50) professional services typically fall anywhere from 20-40% with the national average (based on a recent TRB study of 59 completed projects) of 30%. The assumed soft costs for the streetcar estimates are thus 30.0% of construction costs (SCC 10-50).

- **Unallocated Contingency (SCC 90)** – This category is a contingency (an overall percentage of 10%) applied to the entire project and intended to serve as a project reserve for unanticipated costs incurred during project design and/or construction. This contingency is in addition to the line item (allocated) contingency that is applied individually to each line item in categories 10-70.
- **Inflation** – Inflation is a key component to account for when developing the costs and establishing a project budget. The estimates were developed in 2013 dollars, and escalated to the year of expenditure (YoE) based on mid-year of construction/design. An escalation factor of 3.0% was used and mid-year of construction was assumed to be 2018.
- **Finance Charges (SCC 100)** – This category includes the expected incurred finance charges to complete the project. Costs would typically be derived from the New Starts financial plan. At this stage, Finance Charges are neither assumed nor included in the estimate.

## Unit Costs

Unit costs for each individual component were developed from selected historical data, including final engineering estimates, completed projects, standard estimating manuals, and standard estimating practices. A mix of historical data from various national streetcar projects was used in developing the appropriate unit costs and allowances to be applied to the cost estimate. In most cases, due to the lack of detailed engineering at this stage in the process, allowances were established based on the engineer's and firm's experience. This allowance serves as a "place-holder" until further analysis and design can provide for more accurate and quantifiable units of work.

## Escalation and Inflation Factor

In order to establish accurate project budgets, an escalation factor must be used. The purpose of an escalation factor is to account for anticipated inflation and the increase in the cost of construction, materials and labor over time. The escalation factor is used to take the current year estimate and project it to a future base year or year of expenditure (YoE). For the purpose of this study, the YoE is the year in which the midpoint of construction is anticipated. HDR Engineering assumed 2018 as the year of expenditure for all estimates.

The factor by which the current year estimate has been escalated to the YoE was 3.0%. This value was not established using any scientific method or publications, and should be reviewed by the City of Saint Paul for concurrence. It is a reasonable estimate of the possible inflation that could be expected given the constant fluctuation in the economy and cost of material, fuel and labor. The actual inflation or escalation realized over the next few years could be more or less than the assumed value.

## Summary of Total Project Costs

The estimates include all projects costs including construction, right-of-way, vehicles, professional services (soft costs), allocated and unallocated contingencies and inflation.

Combined, the sum of all components equal the total project cost as viewed by FTA and are established using the FTA Standard Cost Categories (SCC) workbook.

## Estimated Capital Cost Summary

Based on the approach and breakdown described above, HDR developed an estimated capital cost. The total project cost in year of expenditure is estimated in Table 1 below. A detailed summary of the project costs by major SCC cost categories per alternative can be found in Appendix A, and a cost per segment is presented in Figure 2.

Table 1 – Summary of Phase 2 Alternatives in Current Year and Year of Expenditure

Alternative	Phase 2 Cost Estimate				
	Length (Route Miles)	Cost Per Mile 2013.50 (YR)	Cost Per Mile 2018.00 (YR)	Cost 2013.50 (YR)	Cost (YoE) 2018.00 (YR)
Arcade + Maryland	4.21	\$62.7 M	\$71.2 M	\$263.9 M	\$299.8 M
Cleveland	2.89	\$71.8 M	\$81.5 M	\$207.4 M	\$235.6 M
East 7 <sup>th</sup>	3.13	\$63.0 M	\$71.5 M	\$197.1 M	\$223.9 M
Grand + Cleveland	6.76	\$67.1 M	\$76.2 M	\$453.5 M	\$515.1 M
Grand + Cretin	7.11	\$64.8 M	\$73.6 M	\$460.7 M	\$523.4 M
Lexington North	1.95	\$61.8 M	\$70.2 M	\$120.3 M	\$136.6 M
Lexington South	3.01	\$62.4 M	\$70.8 M	\$187.7 M	\$213.2 M
Payne	3.00	\$64.1 M	\$72.8 M	\$192.3 M	\$218.4 M
Randolph + Ford	7.99	\$62.6 M	\$71.1 M	\$500.0 M	\$568.0 M
Raymond	1.97	\$63.0 M	\$71.6 M	\$124.2 M	\$141.1 M
Rice	4.12	\$64.2 M	\$72.9 M	\$264.5 M	\$300.4 M
Robert	2.55	\$63.2 M	\$71.8 M	\$160.9 M	\$182.8 M
Selby + Marshall	5.88	\$62.4 M	\$70.9 M	\$367.1 M	\$417.1 M
Selby + Snelling	5.12	\$62.5 M	\$71.0 M	\$320.1 M	\$363.7 M
Snelling + Ford	5.26	\$62.1 M	\$70.6 M	\$326.8 M	\$371.3 M
Snelling North	2.49	\$63.1 M	\$71.7 M	\$157.1 M	\$178.5 M
Wabasha	2.39	\$63.3 M	\$71.9 M	\$151.4 M	\$171.9 M
West 7 <sup>th</sup>	5.94	\$62.4 M	\$70.9 M	\$370.8 M	\$421.3 M
West 7 <sup>th</sup> + Ford Spur*	7.41	\$58.6 M	\$66.6 M	\$434.5 M	\$493.6 M

\*Ford Spur is currently a railroad right-of-way; therefore no field work was able to be collected during this phase. Further analysis will need to be done to provide a more accurate estimate.



# Appendix A

Order of Magnitude Cost Back-Up


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Arcade + Maryland								Current Year		Inflation Rate
4.2 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$43,600,000</b>		<b>\$8,870,000</b>	<b>\$52,470,000</b>		<b>\$59,934,733</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$42,100,000		\$8,420,000	\$50,520,000		\$57,707,313
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	4.2	\$42,100,000	20%	\$8,420,000	\$50,520,000	2018	\$57,707,313
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$4,210,000</b>		<b>\$1,263,000</b>	<b>\$5,473,000</b>		<b>\$6,251,626</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$4,210,000		\$1,263,000	\$5,473,000		\$6,251,626
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	21.1	\$4,210,000	30%	\$1,263,000	\$5,473,000	2018	\$6,251,626
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$16,840,000</b>		<b>\$3,368,000</b>	<b>\$20,208,000</b>		<b>\$23,082,925</b>
	30.02		Light Maintenance Facility				\$16,840,000		\$3,368,000	\$20,208,000		\$23,082,925
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	4.2	\$16,840,000	20%	\$3,368,000	\$20,208,000	2018	\$23,082,925
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$38,851,426</b>		<b>\$2,778,600</b>	<b>\$41,630,026</b>		<b>\$46,054,536</b>
	40.02		Site Utilities, Utility Relocation				\$9,262,000		\$2,778,600	\$12,040,600		\$13,753,576
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	4.2	\$8,420,000	30%	\$2,526,000	\$10,946,000	2018	\$12,503,251
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	4.2	\$842,000	30%	\$252,600	\$1,094,600	2018	\$1,250,325
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$29,589,426		\$0	\$29,589,426		\$32,300,959
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	134497390.4	\$6,724,870	0%	\$0	\$6,724,870	2018	\$7,681,594
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	134497390.4	\$13,449,739	0%	\$0	\$13,449,739	2018	\$15,363,189
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	134497390.4	\$1,344,974	0%	\$0	\$1,344,974	2018	\$1,536,319
<b>50</b>			<b>SYSTEMS</b>				<b>\$22,523,500</b>		<b>\$5,030,950</b>	<b>\$27,554,450</b>		<b>\$31,474,530</b>
	50.02		Traffic signals and crossing protection				\$5,262,500		\$1,578,750	\$6,841,250		\$7,814,532
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	4.2	\$4,210,000	30%	\$1,263,000	\$5,473,000	2018	\$6,251,626
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	4.2	\$1,052,500	30%	\$315,750	\$1,368,250	2018	\$1,562,906
	50.03		Traction power supply: substations				\$5,052,000		\$1,010,400	\$6,062,400		\$6,924,878
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	4.2	\$5,052,000	20%	\$1,010,400	\$6,062,400	2018	\$6,924,878
	50.04		Traction power distribution: catenary and third rail				\$11,577,500		\$2,315,500	\$13,893,000		\$15,869,511
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	4.2	\$11,577,500	20%	\$2,315,500	\$13,893,000	2018	\$15,869,511
	50.06		Fare collection system and equipment				\$631,500		\$126,300	\$757,800		\$865,610
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	8.4	\$631,500	20%	\$126,300	\$757,800	2018	\$865,610
	<b>Construction Subtotal (10-50)</b>						<b>\$126,024,926</b>		<b>\$21,310,550</b>	<b>\$147,335,476</b>		<b>\$166,798,350</b>






**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Cleveland								Current Year		Inflation Rate
2.9 Route Miles		Approximately \$72 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$40,900,000</b>		<b>\$9,380,000</b>	<b>\$50,280,000</b>		<b>\$57,433,169</b>
		10.01	Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
		10.01.01	Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
		10.03	Guideway: At-grade in mixed traffic				\$28,900,000		\$5,780,000	\$34,680,000		\$39,613,809
		10.03.01	Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	2.9	\$28,900,000	20%	\$5,780,000	\$34,680,000	2018	\$39,613,809
		10.04	Guideway: Aerial structure				\$0		\$0	\$0		\$0
		10.04.01	Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.04.02	Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.04.03	Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.12	Track: Special (switches, turnouts)				\$12,000,000		\$3,600,000	\$15,600,000		\$17,819,360
		10.12.01	At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.12.02	At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	4.0	\$12,000,000	30%	\$3,600,000	\$15,600,000	2018	\$17,819,360
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$2,890,000</b>		<b>\$867,000</b>	<b>\$3,757,000</b>		<b>\$4,291,496</b>
		20.01	At-grade station, stop, shelter, mall, terminal, platform				\$2,890,000		\$867,000	\$3,757,000		\$4,291,496
		20.01.04	Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	14.5	\$2,890,000	30%	\$867,000	\$3,757,000	2018	\$4,291,496
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$11,560,000</b>		<b>\$2,312,000</b>	<b>\$13,872,000</b>		<b>\$15,845,523</b>
		30.02	Light Maintenance Facility				\$11,560,000		\$2,312,000	\$13,872,000		\$15,845,523
		30.02.03	Streetcar MSF Allowance	RM	\$4,000,000	2.9	\$11,560,000	20%	\$2,312,000	\$13,872,000	2018	\$15,845,523
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$30,253,852</b>		<b>\$1,907,400</b>	<b>\$32,161,252</b>		<b>\$35,526,926</b>
		40.02	Site Utilities, Utility Relocation				\$6,358,000		\$1,907,400	\$8,265,400		\$9,441,291
		40.02.02	Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	2.9	\$5,780,000	30%	\$1,734,000	\$7,514,000	2018	\$8,582,992
		40.02.04	On-Street Drainage Modification Allowance	RM	\$200,000	2.9	\$578,000	30%	\$173,400	\$751,400	2018	\$858,299
		40.06	Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
		40.06.01	Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.07	Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
		40.07.01	Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.07.02	Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.08	Temporary Facilities and other indirect costs during construction				\$23,895,852		\$0	\$23,895,852		\$26,085,635
		40.08.01	Temporary Maintenance of Traffic	LS	5.0%	108617511.0	\$5,430,876	0%	\$0	\$5,430,876	2018	\$6,203,508
		40.08.02	Contractor Indirects (Staff, Office, etc.)	LS	10.0%	108617511.0	\$10,861,751	0%	\$0	\$10,861,751	2018	\$12,407,016
		40.08.03	Art in Transit (1% of Construction)	LS	1.0%	108617511.0	\$1,086,175	0%	\$0	\$1,086,175	2018	\$1,240,702
<b>50</b>			<b>SYSTEMS</b>				<b>\$15,461,500</b>		<b>\$3,453,550</b>	<b>\$18,915,050</b>		<b>\$21,606,031</b>
		50.02	Traffic signals and crossing protection				\$3,612,500		\$1,083,750	\$4,696,250		\$5,364,370
		50.02.01	Modify Existing Traffic Signals Allowance	RM	\$1,000,000	2.9	\$2,890,000	30%	\$867,000	\$3,757,000	2018	\$4,291,496
		50.02.02	Streetcar Signal Priority Allowance	RM	\$250,000	2.9	\$722,500	30%	\$216,750	\$939,250	2018	\$1,072,874
		50.03	Traction power supply: substations				\$3,468,000		\$693,600	\$4,161,600		\$4,753,657
		50.03.02	Streetcar TPSS Allowance	RM	\$1,200,000	2.9	\$3,468,000	20%	\$693,600	\$4,161,600	2018	\$4,753,657
		50.04	Traction power distribution: catenary and third rail				\$7,947,500		\$1,589,500	\$9,537,000		\$10,893,797
		50.04.02	Streetcar OCS Allowance	RM	\$2,750,000	2.9	\$7,947,500	20%	\$1,589,500	\$9,537,000	2018	\$10,893,797
		50.06	Fare collection system and equipment				\$433,500		\$86,700	\$520,200		\$594,207
		50.06.02	Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	5.8	\$433,500	20%	\$86,700	\$520,200	2018	\$594,207
		<b>Construction Subtotal (10-50)</b>				<b>0.0</b>	<b>\$101,065,352</b>		<b>\$17,919,950</b>	<b>\$118,985,302</b>		<b>\$134,703,146</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>				<b>\$1,445,000</b>	<b>\$433,500</b>	<b>\$1,878,500</b>		<b>\$2,145,748</b>		
	60.01	Purchase or lease of real estate			\$1,445,000	\$433,500	\$1,878,500		\$2,145,748		
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	2.9	\$1,445,000	30%	\$433,500	\$1,878,500	2018	\$2,145,748
<b>70</b>	<b>VEHICLES (number)</b>				<b>\$26,010,000</b>	<b>\$1,300,500</b>	<b>\$27,310,500</b>		<b>\$31,195,874</b>		
	70.01	Light Rail			\$26,010,000	\$1,300,500	\$27,310,500		\$31,195,874		
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	5.8	\$26,010,000	5%	\$1,300,500	\$27,310,500	2018	\$31,195,874
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>				<b>\$40,410,944</b>	<b>\$0</b>	<b>\$40,410,944</b>		<b>\$46,160,075</b>		
	80.01	Preliminary Engineering			\$4,041,094	\$0	\$4,041,094		\$4,616,007		
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS		3%	134703145.9	0%	\$0	\$4,041,094	2018	\$4,616,007
	80.02	Final Design			\$10,776,252	\$0	\$10,776,252		\$12,309,353		
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS		8%	134703145.9	0%	\$0	\$10,776,252	2018	\$12,309,353
	80.03	Project Management for Design and Construction			\$8,082,189	\$0	\$8,082,189		\$9,232,015		
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS		6%	134703145.9	0%	\$0	\$8,082,189	2018	\$9,232,015
	80.04	Construction Administration & Management			\$8,082,189	\$0	\$8,082,189		\$9,232,015		
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS		6%	134703145.9	0%	\$0	\$8,082,189	2018	\$9,232,015
	80.05	Professional Liability and other Non-Construction Insurance			\$1,347,031	\$0	\$1,347,031		\$1,538,669		
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS		1%	134703145.9	0%	\$0	\$1,347,031	2018	\$1,538,669
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.			\$2,694,063	\$0	\$2,694,063		\$3,077,338		
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS		2%	134703145.9	0%	\$0	\$2,694,063	2018	\$3,077,338
	80.07	Surveys, Testing, Investigation, Inspection			\$2,694,063	\$0	\$2,694,063		\$3,077,338		
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS		2%	134703145.9	0%	\$0	\$2,694,063	2018	\$3,077,338
	80.08	Start up			\$2,694,063	\$0	\$2,694,063		\$3,077,338		
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS		2%	134703145.9	0%	\$0	\$2,694,063	2018	\$3,077,338
	<b>Subtotal (10-80)</b>				<b>0.0</b>	<b>\$168,931,296</b>	<b>\$19,653,950</b>	<b>\$188,585,246</b>	<b>\$214,204,843</b>		
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>				<b>LS</b>	<b>10%</b>		<b>\$18,858,525</b>	<b>\$21,420,484</b>		
<b>100</b>	<b>FINANCE CHARGES</b>							<i>Current Year Total</i>	<i>YoE Total</i>		
	<b>Segment Totals (10-100)</b>							<b>\$207,443,771</b>	<b>\$235,625,327</b>		




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		East 7th								Current Year		Inflation Rate
3.1 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$32,800,000</b>		<b>\$6,710,000</b>	<b>\$39,510,000</b>		<b>\$45,130,957</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$31,300,000		\$6,260,000	\$37,560,000		\$42,903,537
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	3.1	\$31,300,000	20%	\$6,260,000	\$37,560,000	2018	\$42,903,537
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$3,130,000</b>		<b>\$939,000</b>	<b>\$4,069,000</b>		<b>\$4,647,883</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$3,130,000		\$939,000	\$4,069,000		\$4,647,883
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	15.7	\$3,130,000	30%	\$939,000	\$4,069,000	2018	\$4,647,883
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$12,520,000</b>		<b>\$2,504,000</b>	<b>\$15,024,000</b>		<b>\$17,161,415</b>
	30.02		Light Maintenance Facility				\$12,520,000		\$2,504,000	\$15,024,000		\$17,161,415
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	3.1	\$12,520,000	20%	\$2,504,000	\$15,024,000	2018	\$17,161,415
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$29,010,498</b>		<b>\$2,065,800</b>	<b>\$31,076,298</b>		<b>\$34,377,299</b>
	40.02		Site Utilities, Utility Relocation				\$6,886,000		\$2,065,800	\$8,951,800		\$10,225,343
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	3.1	\$6,260,000	30%	\$1,878,000	\$8,138,000	2018	\$9,295,766
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	3.1	\$626,000	30%	\$187,800	\$813,800	2018	\$929,577
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$22,124,498		\$0	\$22,124,498		\$24,151,956
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	100565901.6	\$5,028,295	0%	\$0	\$5,028,295	2018	\$5,743,654
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	100565901.6	\$10,056,590	0%	\$0	\$10,056,590	2018	\$11,487,308
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	100565901.6	\$1,005,659	0%	\$0	\$1,005,659	2018	\$1,148,731
<b>50</b>			<b>SYSTEMS</b>				<b>\$16,745,500</b>		<b>\$3,740,350</b>	<b>\$20,485,850</b>		<b>\$23,400,304</b>
	50.02		Traffic signals and crossing protection				\$3,912,500		\$1,173,750	\$5,086,250		\$5,809,854
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	3.1	\$3,130,000	30%	\$939,000	\$4,069,000	2018	\$4,647,883
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	3.1	\$782,500	30%	\$234,750	\$1,017,250	2018	\$1,161,971
	50.03		Traction power supply: substations				\$3,756,000		\$751,200	\$4,507,200		\$5,148,424
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	3.1	\$3,756,000	20%	\$751,200	\$4,507,200	2018	\$5,148,424
	50.04		Traction power distribution: catenary and third rail				\$8,607,500		\$1,721,500	\$10,329,000		\$11,798,473
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	3.1	\$8,607,500	20%	\$1,721,500	\$10,329,000	2018	\$11,798,473
	50.06		Fare collection system and equipment				\$469,500		\$93,900	\$563,400		\$643,553
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	6.3	\$469,500	20%	\$93,900	\$563,400	2018	\$643,553
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$94,205,998</b>		<b>\$15,959,150</b>	<b>\$110,165,148</b>		<b>\$124,717,858</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>												
	60.01	Purchase or lease of real estate											
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	3.1	\$1,565,000	30%	\$469,500	\$2,034,500	2018		\$2,323,942	
<b>70</b>	<b>VEHICLES (number)</b>												
	70.01	Light Rail											
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	6.3	\$28,170,000	5%	\$1,408,500	\$29,578,500	2018		\$33,786,535	
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>												
	80.01	Preliminary Engineering											
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS										
	80.02	Final Design											
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS										
	80.03	Project Management for Design and Construction											
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS										
	80.04	Construction Administration & Management											
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS										
	80.05	Professional Liability and other Non-Construction Insurance											
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS										
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.											
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS										
	80.07	Surveys, Testing, Investigation, Inspection											
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS										
	80.08	Start up											
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS										
	<b>Subtotal (10-80)</b>					0.0		\$161,356,356	\$17,837,150			\$179,193,506	\$203,566,651
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS									\$17,919,351	\$20,356,665
<b>100</b>	<b>FINANCE CHARGES</b>											<i>Current Year Total</i>	<i>YoE Total</i>
	<b>Segment Totals (10-100)</b>											\$197,112,856	\$223,923,316




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Grand + Cleveland								Current Year		Inflation Rate
6.8 Route Miles		Approximately \$67 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$82,426,000</b>		<b>\$17,967,800</b>	<b>\$100,393,800</b>		<b>\$114,676,493</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$67,600,000		\$13,520,000	\$81,120,000		\$92,660,674
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	6.8	\$67,600,000	20%	\$13,520,000	\$81,120,000	2018	\$92,660,674
	10.04		Guideway: Aerial structure				\$1,326,000		\$397,800	\$1,723,800		\$1,969,039
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	1.0	\$1,326,000	30%	\$397,800	\$1,723,800	2018	\$1,969,039
	10.12		Track: Special (switches, turnouts)				\$13,500,000		\$4,050,000	\$17,550,000		\$20,046,780
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	4.0	\$12,000,000	30%	\$3,600,000	\$15,600,000	2018	\$17,819,360
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$6,760,000</b>		<b>\$2,028,000</b>	<b>\$8,788,000</b>		<b>\$10,038,240</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$6,760,000		\$2,028,000	\$8,788,000		\$10,038,240
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	33.8	\$6,760,000	30%	\$2,028,000	\$8,788,000	2018	\$10,038,240
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$27,040,000</b>		<b>\$5,408,000</b>	<b>\$32,448,000</b>		<b>\$37,064,269</b>
	30.02		Light Maintenance Facility				\$27,040,000		\$5,408,000	\$32,448,000		\$37,064,269
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	6.8	\$27,040,000	20%	\$5,408,000	\$32,448,000	2018	\$37,064,269
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$66,461,397</b>		<b>\$4,461,600</b>	<b>\$70,901,997</b>		<b>\$78,378,180</b>
	40.02		Site Utilities, Utility Relocation				\$14,872,000		\$4,461,600	\$19,333,600		\$22,084,127
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	6.8	\$13,520,000	30%	\$4,056,000	\$17,576,000	2018	\$20,076,479
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	6.8	\$1,352,000	30%	\$405,600	\$1,757,600	2018	\$2,007,648
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$51,568,397		\$0	\$51,568,397		\$56,294,053
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	234401805.4	\$11,720,090	0%	\$0	\$11,720,090	2018	\$13,387,469
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	234401805.4	\$23,440,181	0%	\$0	\$23,440,181	2018	\$26,774,937
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	234401805.4	\$2,344,018	0%	\$0	\$2,344,018	2018	\$2,677,494
<b>50</b>			<b>SYSTEMS</b>				<b>\$36,166,000</b>		<b>\$8,078,200</b>	<b>\$44,244,200</b>		<b>\$50,538,676</b>
	50.02		Traffic signals and crossing protection				\$8,450,000		\$2,535,000	\$10,985,000		\$12,547,800
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	6.8	\$6,760,000	30%	\$2,028,000	\$8,788,000	2018	\$10,038,240
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	6.8	\$1,690,000	30%	\$507,000	\$2,197,000	2018	\$2,509,560
	50.03		Traction power supply: substations				\$8,112,000		\$1,622,400	\$9,734,400		\$11,119,281
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	6.8	\$8,112,000	20%	\$1,622,400	\$9,734,400	2018	\$11,119,281
	50.04		Traction power distribution: catenary and third rail				\$18,590,000		\$3,718,000	\$22,308,000		\$25,481,685
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	6.8	\$18,590,000	20%	\$3,718,000	\$22,308,000	2018	\$25,481,685
	50.06		Fare collection system and equipment				\$1,014,000		\$202,800	\$1,216,800		\$1,389,910
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	13.5	\$1,014,000	20%	\$202,800	\$1,216,800	2018	\$1,389,910
	<b>Construction Subtotal (10-50)</b>					<b>0.0</b>	<b>\$218,832,397</b>		<b>\$37,943,600</b>	<b>\$256,775,997</b>		<b>\$290,695,858</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>						<b>\$3,380,000</b>	<b>\$1,014,000</b>	<b>\$4,394,000</b>		<b>\$5,019,120</b>	
	60.01	Purchase or lease of real estate					\$3,380,000	\$1,014,000	\$4,394,000		\$5,019,120	
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	6.8		\$3,380,000	30%	\$1,014,000	\$4,394,000	2018	\$5,019,120
<b>70</b>	<b>VEHICLES (number)</b>						<b>\$60,840,000</b>		<b>\$3,042,000</b>	<b>\$63,882,000</b>		<b>\$72,970,280</b>
	70.01	Light Rail					\$60,840,000		\$3,042,000	\$63,882,000		\$72,970,280
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	13.5		\$60,840,000	5%	\$3,042,000	\$63,882,000	2018	\$72,970,280
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>						<b>\$87,208,757</b>		<b>\$0</b>	<b>\$87,208,757</b>		<b>\$99,615,658</b>
	80.01	Preliminary Engineering					\$8,720,876		\$0	\$8,720,876		\$9,961,566
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	290695858.2		\$8,720,876	0%	\$0	\$8,720,876	2018	\$9,961,566
	80.02	Final Design					\$23,255,669		\$0	\$23,255,669		\$26,564,176
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	290695858.2		\$23,255,669	0%	\$0	\$23,255,669	2018	\$26,564,176
	80.03	Project Management for Design and Construction					\$17,441,751		\$0	\$17,441,751		\$19,923,132
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	290695858.2		\$17,441,751	0%	\$0	\$17,441,751	2018	\$19,923,132
	80.04	Construction Administration & Management					\$17,441,751		\$0	\$17,441,751		\$19,923,132
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	290695858.2		\$17,441,751	0%	\$0	\$17,441,751	2018	\$19,923,132
	80.05	Professional Liability and other Non-Construction Insurance					\$2,906,959		\$0	\$2,906,959		\$3,320,522
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	290695858.2		\$2,906,959	0%	\$0	\$2,906,959	2018	\$3,320,522
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.					\$5,813,917		\$0	\$5,813,917		\$6,641,044
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	290695858.2		\$5,813,917	0%	\$0	\$5,813,917	2018	\$6,641,044
	80.07	Surveys, Testing, Investigation, Inspection					\$5,813,917		\$0	\$5,813,917		\$6,641,044
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	290695858.2		\$5,813,917	0%	\$0	\$5,813,917	2018	\$6,641,044
	80.08	Start up					\$5,813,917		\$0	\$5,813,917		\$6,641,044
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	290695858.2		\$5,813,917	0%	\$0	\$5,813,917	2018	\$6,641,044
	<b>Subtotal (10-80)</b>					<b>0.0</b>	<b>\$370,261,155</b>		<b>\$41,999,600</b>	<b>\$412,260,755</b>		<b>\$468,300,917</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%						<b>\$41,226,075</b>		<b>\$46,830,092</b>
<b>100</b>	<b>FINANCE CHARGES</b>									<i>Current Year Total</i>		<i>YoE Total</i>
	<b>Segment Totals (10-100)</b>									<b>\$453,486,830</b>		<b>\$515,131,009</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Grand + Cretin								Current Year		Inflation Rate
7.1 Route Miles		Approximately \$65 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$79,926,000</b>		<b>\$16,867,800</b>	<b>\$96,793,800</b>		<b>\$110,564,333</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$71,100,000		\$14,220,000	\$85,320,000		\$97,458,194
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	7.1	\$71,100,000	20%	\$14,220,000	\$85,320,000	2018	\$97,458,194
	10.04		Guideway: Aerial structure				\$1,326,000		\$397,800	\$1,723,800		\$1,969,039
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	1.0	\$1,326,000	30%	\$397,800	\$1,723,800	2018	\$1,969,039
	10.12		Track: Special (switches, turnouts)				\$7,500,000		\$2,250,000	\$9,750,000		\$11,137,100
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	2.0	\$6,000,000	30%	\$1,800,000	\$7,800,000	2018	\$8,909,680
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$7,110,000</b>		<b>\$2,133,000</b>	<b>\$9,243,000</b>		<b>\$10,557,971</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$7,110,000		\$2,133,000	\$9,243,000		\$10,557,971
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	35.6	\$7,110,000	30%	\$2,133,000	\$9,243,000	2018	\$10,557,971
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$28,440,000</b>		<b>\$5,688,000</b>	<b>\$34,128,000</b>		<b>\$38,983,277</b>
	30.02		Light Maintenance Facility				\$28,440,000		\$5,688,000	\$34,128,000		\$38,983,277
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	7.1	\$28,440,000	20%	\$5,688,000	\$34,128,000	2018	\$38,983,277
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$67,692,457</b>		<b>\$4,692,600</b>	<b>\$72,385,057</b>		<b>\$80,022,717</b>
	40.02		Site Utilities, Utility Relocation				\$15,642,000		\$4,692,600	\$20,334,600		\$23,227,536
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	7.1	\$14,220,000	30%	\$4,266,000	\$18,486,000	2018	\$21,115,942
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	7.1	\$1,422,000	30%	\$426,600	\$1,848,600	2018	\$2,111,594
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$52,027,457		\$0	\$52,027,457		\$56,795,180
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	236488441.0	\$11,824,422	0%	\$0	\$11,824,422	2018	\$13,506,643
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	236488441.0	\$23,648,844	0%	\$0	\$23,648,844	2018	\$27,013,287
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	236488441.0	\$2,364,884	0%	\$0	\$2,364,884	2018	\$2,701,329
<b>50</b>			<b>SYSTEMS</b>				<b>\$38,038,500</b>		<b>\$8,496,450</b>	<b>\$46,534,950</b>		<b>\$53,155,323</b>
	50.02		Traffic signals and crossing protection				\$8,887,500		\$2,666,250	\$11,553,750		\$13,197,464
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	7.1	\$7,110,000	30%	\$2,133,000	\$9,243,000	2018	\$10,557,971
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	7.1	\$1,777,500	30%	\$533,250	\$2,310,750	2018	\$2,639,493
	50.03		Traction power supply: substations				\$8,532,000		\$1,706,400	\$10,238,400		\$11,694,983
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	7.1	\$8,532,000	20%	\$1,706,400	\$10,238,400	2018	\$11,694,983
	50.04		Traction power distribution: catenary and third rail				\$19,552,500		\$3,910,500	\$23,463,000		\$26,801,003
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	7.1	\$19,552,500	20%	\$3,910,500	\$23,463,000	2018	\$26,801,003
	50.06		Fare collection system and equipment				\$1,066,500		\$213,300	\$1,279,800		\$1,461,873
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	14.2	\$1,066,500	20%	\$213,300	\$1,279,800	2018	\$1,461,873
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$221,183,957</b>		<b>\$37,877,850</b>	<b>\$259,061,807</b>		<b>\$293,283,621</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>					<b>\$3,555,000</b>	<b>\$1,066,500</b>	<b>\$4,621,500</b>			
60.01	Purchase or lease of real estate					\$3,555,000	\$1,066,500	\$4,621,500		\$5,278,985	
60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	7.1		\$3,555,000	30%	\$1,066,500	\$4,621,500	2018	\$5,278,985
<b>70</b>	<b>VEHICLES (number)</b>					<b>\$63,990,000</b>		<b>\$3,199,500</b>	<b>\$67,189,500</b>		<b>\$76,748,328</b>
70.01	Light Rail					\$63,990,000		\$3,199,500	\$67,189,500		\$76,748,328
70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	14.2		\$63,990,000	5%	\$3,199,500	\$67,189,500	2018	\$76,748,328
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>					<b>\$87,985,086</b>		<b>\$0</b>	<b>\$87,985,086</b>		<b>\$100,502,433</b>
80.01	Preliminary Engineering					\$8,798,509		\$0	\$8,798,509		\$10,050,243
80.01.01	Percentage of Direct Costs SCC (10-50)	LS		3%	293283621.4	\$8,798,509	0%	\$0	\$8,798,509	2018	\$10,050,243
80.02	Final Design					\$23,462,690		\$0	\$23,462,690		\$26,800,649
80.02.01	Percentage of Direct Costs SCC (10-50)	LS		8%	293283621.4	\$23,462,690	0%	\$0	\$23,462,690	2018	\$26,800,649
80.03	Project Management for Design and Construction					\$17,597,017		\$0	\$17,597,017		\$20,100,487
80.03.01	Percentage of Direct Costs SCC (10-50)	LS		6%	293283621.4	\$17,597,017	0%	\$0	\$17,597,017	2018	\$20,100,487
80.04	Construction Administration & Management					\$17,597,017		\$0	\$17,597,017		\$20,100,487
80.04.01	Percentage of Direct Costs SCC (10-50)	LS		6%	293283621.4	\$17,597,017	0%	\$0	\$17,597,017	2018	\$20,100,487
80.05	Professional Liability and other Non-Construction Insurance					\$2,932,836		\$0	\$2,932,836		\$3,350,081
80.05.01	Percentage of Direct Costs SCC (10-50)	LS		1%	293283621.4	\$2,932,836	0%	\$0	\$2,932,836	2018	\$3,350,081
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.					\$5,865,672		\$0	\$5,865,672		\$6,700,162
80.06.01	Percentage of Direct Costs SCC (10-50)	LS		2%	293283621.4	\$5,865,672	0%	\$0	\$5,865,672	2018	\$6,700,162
80.07	Surveys, Testing, Investigation, Inspection					\$5,865,672		\$0	\$5,865,672		\$6,700,162
80.07.01	Percentage of Direct Costs SCC (10-50)	LS		2%	293283621.4	\$5,865,672	0%	\$0	\$5,865,672	2018	\$6,700,162
80.08	Start up					\$5,865,672		\$0	\$5,865,672		\$6,700,162
80.08.01	Percentage of Direct Costs SCC (10-50)	LS		2%	293283621.4	\$5,865,672	0%	\$0	\$5,865,672	2018	\$6,700,162
<b>Subtotal (10-80)</b>					<b>0.0</b>	<b>\$376,714,043</b>		<b>\$42,143,850</b>	<b>\$418,857,893</b>		<b>\$475,813,368</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>	LS		<b>10%</b>					<b>\$41,885,789</b>		<b>\$47,581,337</b>
<b>100</b>	<b>FINANCE CHARGES</b>								<i>Current Year Total</i>		<i>YoE Total</i>
<b>Segment Totals (10-100)</b>									<b>\$460,743,683</b>		<b>\$523,394,704</b>






**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Lexington North								Current Year		Inflation Rate
1.9 Route Miles		Approximately \$62 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$19,450,000</b>		<b>\$3,890,000</b>	<b>\$23,340,000</b>		<b>\$26,660,504</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$19,450,000		\$3,890,000	\$23,340,000		\$26,660,504
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	1.9	\$19,450,000	20%	\$3,890,000	\$23,340,000	2018	\$26,660,504
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$0		\$0	\$0		\$0
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$1,945,000</b>		<b>\$583,500</b>	<b>\$2,528,500</b>		<b>\$2,888,221</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$1,945,000		\$583,500	\$2,528,500		\$2,888,221
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	9.7	\$1,945,000	30%	\$583,500	\$2,528,500	2018	\$2,888,221
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$7,780,000</b>		<b>\$1,556,000</b>	<b>\$9,336,000</b>		<b>\$10,664,202</b>
	30.02		Light Maintenance Facility				\$7,780,000		\$1,556,000	\$9,336,000		\$10,664,202
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	1.9	\$7,780,000	20%	\$1,556,000	\$9,336,000	2018	\$10,664,202
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$17,722,782</b>		<b>\$1,283,700</b>	<b>\$19,006,482</b>		<b>\$21,029,838</b>
	40.02		Site Utilities, Utility Relocation				\$4,279,000		\$1,283,700	\$5,562,700		\$6,354,087
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	1.9	\$3,890,000	30%	\$1,167,000	\$5,057,000	2018	\$5,776,443
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	1.9	\$389,000	30%	\$116,700	\$505,700	2018	\$577,644
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$13,443,782		\$0	\$13,443,782		\$14,675,751
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	61108098.0	\$3,055,405	0%	\$0	\$3,055,405	2018	\$3,490,087
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	61108098.0	\$6,110,810	0%	\$0	\$6,110,810	2018	\$6,980,174
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	61108098.0	\$611,081	0%	\$0	\$611,081	2018	\$698,017
<b>50</b>			<b>SYSTEMS</b>				<b>\$10,405,750</b>		<b>\$2,324,275</b>	<b>\$12,730,025</b>		<b>\$14,541,083</b>
	50.02		Traffic signals and crossing protection				\$2,431,250		\$729,375	\$3,160,625		\$3,610,277
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	1.9	\$1,945,000	30%	\$583,500	\$2,528,500	2018	\$2,888,221
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	1.9	\$486,250	30%	\$145,875	\$632,125	2018	\$722,055
	50.03		Traction power supply: substations				\$2,334,000		\$466,800	\$2,800,800		\$3,199,261
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	1.9	\$2,334,000	20%	\$466,800	\$2,800,800	2018	\$3,199,261
	50.04		Traction power distribution: catenary and third rail				\$5,348,750		\$1,069,750	\$6,418,500		\$7,331,639
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	1.9	\$5,348,750	20%	\$1,069,750	\$6,418,500	2018	\$7,331,639
	50.06		Fare collection system and equipment				\$291,750		\$58,350	\$350,100		\$399,908
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	3.9	\$291,750	20%	\$58,350	\$350,100	2018	\$399,908
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$57,303,532</b>		<b>\$9,637,475</b>	<b>\$66,941,007</b>		<b>\$75,783,849</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>						<b>\$972,500</b>	<b>\$291,750</b>	<b>\$1,264,250</b>		<b>\$1,444,111</b>	
	60.01	Purchase or lease of real estate					\$972,500	\$291,750	\$1,264,250		\$1,444,111	
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	1.9		\$972,500	30%	\$291,750	\$1,264,250	2018	\$1,444,111
<b>70</b>	<b>VEHICLES (number)</b>						<b>\$17,505,000</b>	<b>\$875,250</b>	<b>\$18,380,250</b>		<b>\$20,995,147</b>	
	70.01	Light Rail					\$17,505,000	\$875,250	\$18,380,250		\$20,995,147	
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	3.9		\$17,505,000	5%	\$875,250	\$18,380,250	2018	\$20,995,147
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>						<b>\$22,735,155</b>	<b>\$0</b>	<b>\$22,735,155</b>		<b>\$25,969,610</b>	
	80.01	Preliminary Engineering					\$2,273,515	\$0	\$2,273,515		\$2,596,961	
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	75783848.8		\$2,273,515	0%	\$0	\$2,273,515	2018	\$2,596,961
	80.02	Final Design					\$6,062,708	\$0	\$6,062,708		\$6,925,229	
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	75783848.8		\$6,062,708	0%	\$0	\$6,062,708	2018	\$6,925,229
	80.03	Project Management for Design and Construction					\$4,547,031	\$0	\$4,547,031		\$5,193,922	
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	75783848.8		\$4,547,031	0%	\$0	\$4,547,031	2018	\$5,193,922
	80.04	Construction Administration & Management					\$4,547,031	\$0	\$4,547,031		\$5,193,922	
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	75783848.8		\$4,547,031	0%	\$0	\$4,547,031	2018	\$5,193,922
	80.05	Professional Liability and other Non-Construction Insurance					\$757,838	\$0	\$757,838		\$865,654	
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	75783848.8		\$757,838	0%	\$0	\$757,838	2018	\$865,654
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.					\$1,515,677	\$0	\$1,515,677		\$1,731,307	
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	75783848.8		\$1,515,677	0%	\$0	\$1,515,677	2018	\$1,731,307
	80.07	Surveys, Testing, Investigation, Inspection					\$1,515,677	\$0	\$1,515,677		\$1,731,307	
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	75783848.8		\$1,515,677	0%	\$0	\$1,515,677	2018	\$1,731,307
	80.08	Start up					\$1,515,677	\$0	\$1,515,677		\$1,731,307	
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	75783848.8		\$1,515,677	0%	\$0	\$1,515,677	2018	\$1,731,307
	<b>Subtotal (10-80)</b>					<b>0.0</b>	<b>\$98,516,186</b>		<b>\$10,804,475</b>	<b>\$109,320,661</b>		<b>\$124,192,717</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%						<b>\$10,932,066</b>		<b>\$12,419,272</b>
<b>100</b>	<b>FINANCE CHARGES</b>									<i>Current Year Total</i>		<i>YoE Total</i>
	<b>Segment Totals (10-100)</b>									<b>\$120,252,727</b>		<b>\$136,611,988</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Lexington South								Current Year		Inflation Rate
3.0 Route Miles		Approximately \$62 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$30,763,000</b>		<b>\$6,218,900</b>	<b>\$36,981,900</b>		<b>\$42,243,192</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$30,100,000		\$6,020,000	\$36,120,000		\$41,258,673
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	3.0	\$30,100,000	20%	\$6,020,000	\$36,120,000	2018	\$41,258,673
	10.04		Guideway: Aerial structure				\$663,000		\$198,900	\$861,900		\$984,520
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	1.0	\$663,000	30%	\$198,900	\$861,900	2018	\$984,520
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$0		\$0	\$0		\$0
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$3,010,000</b>		<b>\$903,000</b>	<b>\$3,913,000</b>		<b>\$4,469,690</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$3,010,000		\$903,000	\$3,913,000		\$4,469,690
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	15.1	\$3,010,000	30%	\$903,000	\$3,913,000	2018	\$4,469,690
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$12,040,000</b>		<b>\$2,408,000</b>	<b>\$14,448,000</b>		<b>\$16,503,469</b>
	30.02		Light Maintenance Facility				\$12,040,000		\$2,408,000	\$14,448,000		\$16,503,469
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	3.0	\$12,040,000	20%	\$2,408,000	\$14,448,000	2018	\$16,503,469
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$27,643,624</b>		<b>\$1,986,600</b>	<b>\$29,630,224</b>		<b>\$32,781,333</b>
	40.02		Site Utilities, Utility Relocation				\$6,622,000		\$1,986,600	\$8,608,600		\$9,833,317
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	3.0	\$6,020,000	30%	\$1,806,000	\$7,826,000	2018	\$8,939,379
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	3.0	\$602,000	30%	\$180,600	\$782,600	2018	\$893,938
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$21,021,624		\$0	\$21,021,624		\$22,948,016
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	95552835.8	\$4,777,642	0%	\$0	\$4,777,642	2018	\$5,457,341
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	95552835.8	\$9,555,284	0%	\$0	\$9,555,284	2018	\$10,914,682
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	95552835.8	\$955,528	0%	\$0	\$955,528	2018	\$1,091,468
<b>50</b>			<b>SYSTEMS</b>				<b>\$16,103,500</b>		<b>\$3,596,950</b>	<b>\$19,700,450</b>		<b>\$22,503,168</b>
	50.02		Traffic signals and crossing protection				\$3,762,500		\$1,128,750	\$4,891,250		\$5,587,112
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	3.0	\$3,010,000	30%	\$903,000	\$3,913,000	2018	\$4,469,690
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	3.0	\$752,500	30%	\$225,750	\$978,250	2018	\$1,117,422
	50.03		Traction power supply: substations				\$3,612,000		\$722,400	\$4,334,400		\$4,951,041
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	3.0	\$3,612,000	20%	\$722,400	\$4,334,400	2018	\$4,951,041
	50.04		Traction power distribution: catenary and third rail				\$8,277,500		\$1,655,500	\$9,933,000		\$11,346,135
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	3.0	\$8,277,500	20%	\$1,655,500	\$9,933,000	2018	\$11,346,135
	50.06		Fare collection system and equipment				\$451,500		\$90,300	\$541,800		\$618,880
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	6.0	\$451,500	20%	\$90,300	\$541,800	2018	\$618,880
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$89,560,124</b>		<b>\$15,113,450</b>	<b>\$104,673,574</b>		<b>\$118,500,852</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>						<b>\$1,505,000</b>	<b>\$451,500</b>	<b>\$1,956,500</b>		<b>\$2,234,845</b>	
	60.01	Purchase or lease of real estate					\$1,505,000	\$451,500	\$1,956,500		\$2,234,845	
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM		\$500,000	3.0	\$1,505,000	30%	\$451,500	\$1,956,500	2018	\$2,234,845
<b>70</b>	<b>VEHICLES (number)</b>						<b>\$27,090,000</b>	<b>\$1,354,500</b>	<b>\$28,444,500</b>		<b>\$32,491,205</b>	
	70.01	Light Rail					\$27,090,000	\$1,354,500	\$28,444,500		\$32,491,205	
	70.01.02	Modern Streetcar Vehicle Allowance	EA		\$4,500,000	6.0	\$27,090,000	5%	\$1,354,500	\$28,444,500	2018	\$32,491,205
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>						<b>\$35,550,256</b>	<b>\$0</b>	<b>\$35,550,256</b>		<b>\$40,607,873</b>	
	80.01	Preliminary Engineering					\$3,555,026	\$0	\$3,555,026		\$4,060,787	
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS		3%	118500851.8	\$3,555,026	0%	\$0	\$3,555,026	2018	\$4,060,787
	80.02	Final Design					\$9,480,068	\$0	\$9,480,068		\$10,828,766	
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS		8%	118500851.8	\$9,480,068	0%	\$0	\$9,480,068	2018	\$10,828,766
	80.03	Project Management for Design and Construction					\$7,110,051	\$0	\$7,110,051		\$8,121,575	
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS		6%	118500851.8	\$7,110,051	0%	\$0	\$7,110,051	2018	\$8,121,575
	80.04	Construction Administration & Management					\$7,110,051	\$0	\$7,110,051		\$8,121,575	
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS		6%	118500851.8	\$7,110,051	0%	\$0	\$7,110,051	2018	\$8,121,575
	80.05	Professional Liability and other Non-Construction Insurance					\$1,185,009	\$0	\$1,185,009		\$1,353,596	
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS		1%	118500851.8	\$1,185,009	0%	\$0	\$1,185,009	2018	\$1,353,596
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.					\$2,370,017	\$0	\$2,370,017		\$2,707,192	
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS		2%	118500851.8	\$2,370,017	0%	\$0	\$2,370,017	2018	\$2,707,192
	80.07	Surveys, Testing, Investigation, Inspection					\$2,370,017	\$0	\$2,370,017		\$2,707,192	
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS		2%	118500851.8	\$2,370,017	0%	\$0	\$2,370,017	2018	\$2,707,192
	80.08	Start up					\$2,370,017	\$0	\$2,370,017		\$2,707,192	
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS		2%	118500851.8	\$2,370,017	0%	\$0	\$2,370,017	2018	\$2,707,192
	<b>Subtotal (10-80)</b>					<b>0.0</b>	<b>\$153,705,379</b>		<b>\$16,919,450</b>	<b>\$170,624,829</b>		<b>\$193,834,774</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS							<b>\$17,062,483</b>		<b>\$19,383,477</b>
<b>100</b>	<b>FINANCE CHARGES</b>									<i>Current Year Total</i>		<i>YoE Total</i>
	<b>Segment Totals (10-100)</b>									<b>\$187,687,312</b>		<b>\$213,218,251</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Payne								Current Year		Inflation Rate
3.0 Route Miles		Approximately \$64 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$32,826,000</b>		<b>\$6,847,800</b>	<b>\$39,673,800</b>		<b>\$45,318,060</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$30,000,000		\$6,000,000	\$36,000,000		\$41,121,601
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	3.0	\$30,000,000	20%	\$6,000,000	\$36,000,000	2018	\$41,121,601
	10.04		Guideway: Aerial structure				\$1,326,000		\$397,800	\$1,723,800		\$1,969,039
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	1.0	\$1,326,000	30%	\$397,800	\$1,723,800	2018	\$1,969,039
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$3,000,000</b>		<b>\$900,000</b>	<b>\$3,900,000</b>		<b>\$4,454,840</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$3,000,000		\$900,000	\$3,900,000		\$4,454,840
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	15.0	\$3,000,000	30%	\$900,000	\$3,900,000	2018	\$4,454,840
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$12,000,000</b>		<b>\$2,400,000</b>	<b>\$14,400,000</b>		<b>\$16,448,640</b>
	30.02		Light Maintenance Facility				\$12,000,000		\$2,400,000	\$14,400,000		\$16,448,640
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	3.0	\$12,000,000	20%	\$2,400,000	\$14,400,000	2018	\$16,448,640
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$28,259,131</b>		<b>\$1,980,000</b>	<b>\$30,239,131</b>		<b>\$33,444,592</b>
	40.02		Site Utilities, Utility Relocation				\$6,600,000		\$1,980,000	\$8,580,000		\$9,800,648
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	3.0	\$6,000,000	30%	\$1,800,000	\$7,800,000	2018	\$8,909,680
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	3.0	\$600,000	30%	\$180,000	\$780,000	2018	\$890,968
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$21,659,131		\$0	\$21,659,131		\$23,643,943
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	98450595.0	\$4,922,530	0%	\$0	\$4,922,530	2018	\$5,622,842
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	98450595.0	\$9,845,060	0%	\$0	\$9,845,060	2018	\$11,245,683
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	98450595.0	\$984,506	0%	\$0	\$984,506	2018	\$1,124,568
<b>50</b>			<b>SYSTEMS</b>				<b>\$16,050,000</b>		<b>\$3,585,000</b>	<b>\$19,635,000</b>		<b>\$22,428,406</b>
	50.02		Traffic signals and crossing protection				\$3,750,000		\$1,125,000	\$4,875,000		\$5,568,550
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	3.0	\$3,000,000	30%	\$900,000	\$3,900,000	2018	\$4,454,840
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	3.0	\$750,000	30%	\$225,000	\$975,000	2018	\$1,113,710
	50.03		Traction power supply: substations				\$3,600,000		\$720,000	\$4,320,000		\$4,934,592
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	3.0	\$3,600,000	20%	\$720,000	\$4,320,000	2018	\$4,934,592
	50.04		Traction power distribution: catenary and third rail				\$8,250,000		\$1,650,000	\$9,900,000		\$11,308,440
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	3.0	\$8,250,000	20%	\$1,650,000	\$9,900,000	2018	\$11,308,440
	50.06		Fare collection system and equipment				\$450,000		\$90,000	\$540,000		\$616,824
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	6.0	\$450,000	20%	\$90,000	\$540,000	2018	\$616,824
	<b>Construction Subtotal (10-50)</b>					<b>0.0</b>	<b>\$92,135,131</b>		<b>\$15,712,800</b>	<b>\$107,847,931</b>		<b>\$122,094,538</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>				<b>\$1,500,000</b>		<b>\$450,000</b>	<b>\$1,950,000</b>		<b>\$2,227,420</b>	
	60.01	Purchase or lease of real estate			\$1,500,000		\$450,000	\$1,950,000		\$2,227,420	
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	3.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
<b>70</b>	<b>VEHICLES (number)</b>				<b>\$27,000,000</b>		<b>\$1,350,000</b>	<b>\$28,350,000</b>		<b>\$32,383,261</b>	
	70.01	Light Rail			\$27,000,000		\$1,350,000	\$28,350,000		\$32,383,261	
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	6.0	\$27,000,000	5%	\$1,350,000	\$28,350,000	2018	\$32,383,261
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>				<b>\$36,628,362</b>		<b>\$0</b>	<b>\$36,628,362</b>		<b>\$41,839,357</b>	
	80.01	Preliminary Engineering			\$3,662,836		\$0	\$3,662,836		\$4,183,936	
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	122094538.3	\$3,662,836	0%	\$0	\$3,662,836	2018	\$4,183,936
	80.02	Final Design			\$9,767,563		\$0	\$9,767,563		\$11,157,162	
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	122094538.3	\$9,767,563	0%	\$0	\$9,767,563	2018	\$11,157,162
	80.03	Project Management for Design and Construction			\$7,325,672		\$0	\$7,325,672		\$8,367,871	
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	122094538.3	\$7,325,672	0%	\$0	\$7,325,672	2018	\$8,367,871
	80.04	Construction Administration & Management			\$7,325,672		\$0	\$7,325,672		\$8,367,871	
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	122094538.3	\$7,325,672	0%	\$0	\$7,325,672	2018	\$8,367,871
	80.05	Professional Liability and other Non-Construction Insurance			\$1,220,945		\$0	\$1,220,945		\$1,394,645	
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	122094538.3	\$1,220,945	0%	\$0	\$1,220,945	2018	\$1,394,645
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.			\$2,441,891		\$0	\$2,441,891		\$2,789,290	
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	122094538.3	\$2,441,891	0%	\$0	\$2,441,891	2018	\$2,789,290
	80.07	Surveys, Testing, Investigation, Inspection			\$2,441,891		\$0	\$2,441,891		\$2,789,290	
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	122094538.3	\$2,441,891	0%	\$0	\$2,441,891	2018	\$2,789,290
	80.08	Start up			\$2,441,891		\$0	\$2,441,891		\$2,789,290	
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	122094538.3	\$2,441,891	0%	\$0	\$2,441,891	2018	\$2,789,290
	<b>Subtotal (10-80)</b>				<b>0.0</b>	<b>\$157,263,492</b>		<b>\$17,512,800</b>	<b>\$174,776,292</b>		<b>\$198,544,576</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%					<b>\$17,477,629</b>		<b>\$19,854,458</b>
<b>100</b>	<b>FINANCE CHARGES</b>								<i>Current Year Total</i>		<i>YoE Total</i>
	<b>Segment Totals (10-100)</b>								<b>\$192,253,922</b>		<b>\$218,399,034</b>






**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Randolph + Ford								Current Year		Inflation Rate
8.0 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$82,394,500</b>		<b>\$16,728,350</b>	<b>\$99,122,850</b>		<b>\$113,224,729</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$79,900,000		\$15,980,000	\$95,880,000		\$109,520,530
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	8.0	\$79,900,000	20%	\$15,980,000	\$95,880,000	2018	\$109,520,530
	10.04		Guideway: Aerial structure				\$994,500		\$298,350	\$1,292,850		\$1,476,779
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	1.0	\$331,500	30%	\$99,450	\$430,950	2018	\$492,260
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	1.0	\$663,000	30%	\$198,900	\$861,900	2018	\$984,520
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$7,990,000</b>		<b>\$2,397,000</b>	<b>\$10,387,000</b>		<b>\$11,864,724</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$7,990,000		\$2,397,000	\$10,387,000		\$11,864,724
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	40.0	\$7,990,000	30%	\$2,397,000	\$10,387,000	2018	\$11,864,724
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$31,960,000</b>		<b>\$6,392,000</b>	<b>\$38,352,000</b>		<b>\$43,808,212</b>
	30.02		Light Maintenance Facility				\$31,960,000		\$6,392,000	\$38,352,000		\$43,808,212
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	8.0	\$31,960,000	20%	\$6,392,000	\$38,352,000	2018	\$43,808,212
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$73,619,564</b>		<b>\$5,273,400</b>	<b>\$78,892,964</b>		<b>\$87,279,527</b>
	40.02		Site Utilities, Utility Relocation				\$17,578,000		\$5,273,400	\$22,851,400		\$26,102,393
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	8.0	\$15,980,000	30%	\$4,794,000	\$20,774,000	2018	\$23,729,448
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	8.0	\$1,598,000	30%	\$479,400	\$2,077,400	2018	\$2,372,945
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$56,041,564		\$0	\$56,041,564		\$61,177,134
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	254734380.8	\$12,736,719	0%	\$0	\$12,736,719	2018	\$14,548,730
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	254734380.8	\$25,473,438	0%	\$0	\$25,473,438	2018	\$29,097,460
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	254734380.8	\$2,547,344	0%	\$0	\$2,547,344	2018	\$2,909,746
<b>50</b>			<b>SYSTEMS</b>				<b>\$42,746,500</b>		<b>\$9,548,050</b>	<b>\$52,294,550</b>		<b>\$59,734,322</b>
	50.02		Traffic signals and crossing protection				\$9,987,500		\$2,996,250	\$12,983,750		\$14,830,905
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	8.0	\$7,990,000	30%	\$2,397,000	\$10,387,000	2018	\$11,864,724
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	8.0	\$1,997,500	30%	\$599,250	\$2,596,750	2018	\$2,966,181
	50.03		Traction power supply: substations				\$9,588,000		\$1,917,600	\$11,505,600		\$13,142,464
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	8.0	\$9,588,000	20%	\$1,917,600	\$11,505,600	2018	\$13,142,464
	50.04		Traction power distribution: catenary and third rail				\$21,972,500		\$4,394,500	\$26,367,000		\$30,118,146
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	8.0	\$21,972,500	20%	\$4,394,500	\$26,367,000	2018	\$30,118,146
	50.06		Fare collection system and equipment				\$1,198,500		\$239,700	\$1,438,200		\$1,642,808
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	16.0	\$1,198,500	20%	\$239,700	\$1,438,200	2018	\$1,642,808
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$238,710,564</b>		<b>\$40,338,800</b>	<b>\$279,049,364</b>		<b>\$315,911,515</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>												
	60.01	Purchase or lease of real estate											
		60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	8.0	\$3,995,000	30%	\$1,198,500	\$5,193,500	2018	\$5,932,362	
<b>70</b>	<b>VEHICLES (number)</b>												
	70.01	Light Rail											
		70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	16.0	\$71,910,000	5%	\$3,595,500	\$75,505,500	2018	\$86,247,417	
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>												
	80.01	Preliminary Engineering											
		80.01.01	Percentage of Direct Costs SCC (10-50)	LS			\$9,477,345	0%	\$0	\$9,477,345	2018	\$10,825,656	
	80.02	Final Design											
		80.02.01	Percentage of Direct Costs SCC (10-50)	LS		8%	315911515.1	0%	\$0	\$25,272,921	2018	\$28,868,416	
	80.03	Project Management for Design and Construction											
		80.03.01	Percentage of Direct Costs SCC (10-50)	LS		6%	315911515.1	0%	\$0	\$18,954,691	2018	\$21,651,312	
	80.04	Construction Administration & Management											
		80.04.01	Percentage of Direct Costs SCC (10-50)	LS		6%	315911515.1	0%	\$0	\$18,954,691	2018	\$21,651,312	
	80.05	Professional Liability and other Non-Construction Insurance											
		80.05.01	Percentage of Direct Costs SCC (10-50)	LS		1%	315911515.1	0%	\$0	\$3,159,115	2018	\$3,608,552	
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.											
		80.06.01	Percentage of Direct Costs SCC (10-50)	LS		2%	315911515.1	0%	\$0	\$6,318,230	2018	\$7,217,104	
	80.07	Surveys, Testing, Investigation, Inspection											
		80.07.01	Percentage of Direct Costs SCC (10-50)	LS		2%	315911515.1	0%	\$0	\$6,318,230	2018	\$7,217,104	
	80.08	Start up											
		80.08.01	Percentage of Direct Costs SCC (10-50)	LS		2%	315911515.1	0%	\$0	\$6,318,230	2018	\$7,217,104	
		<b>Subtotal (10-80)</b>					0.0	\$409,389,018	\$45,132,800	\$454,521,818		\$516,347,854	
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>			LS		10%				\$45,452,182		\$51,634,785	
<b>100</b>	<b>FINANCE CHARGES</b>									<i>Current Year Total</i>		<i>YoE Total</i>	
		<b>Segment Totals (10-100)</b>								\$499,974,000		\$567,982,640	




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Raymond								Current Year		Inflation Rate
2.0 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				\$19,700,000		\$3,940,000	\$23,640,000		\$27,003,184
		10.01	Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
		10.01.01	Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
		10.03	Guideway: At-grade in mixed traffic				\$19,700,000		\$3,940,000	\$23,640,000		\$27,003,184
		10.03.01	Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	2.0	\$19,700,000	20%	\$3,940,000	\$23,640,000	2018	\$27,003,184
		10.04	Guideway: Aerial structure				\$0		\$0	\$0		\$0
		10.04.01	Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.04.02	Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.04.03	Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.12	Track: Special (switches, turnouts)				\$0		\$0	\$0		\$0
		10.12.01	At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.12.02	At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				\$1,970,000		\$591,000	\$2,561,000		\$2,925,345
		20.01	At-grade station, stop, shelter, mall, terminal, platform				\$1,970,000		\$591,000	\$2,561,000		\$2,925,345
		20.01.04	Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	9.9	\$1,970,000	30%	\$591,000	\$2,561,000	2018	\$2,925,345
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				\$7,880,000		\$1,576,000	\$9,456,000		\$10,801,274
		30.02	Light Maintenance Facility				\$7,880,000		\$1,576,000	\$9,456,000		\$10,801,274
		30.02.03	Streetcar MSF Allowance	RM	\$4,000,000	2.0	\$7,880,000	20%	\$1,576,000	\$9,456,000	2018	\$10,801,274
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				\$19,277,269		\$1,600,200	\$20,877,469		\$23,141,716
		40.02	Site Utilities, Utility Relocation				\$4,334,000		\$1,300,200	\$5,634,200		\$6,435,759
		40.02.02	Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	2.0	\$3,940,000	30%	\$1,182,000	\$5,122,000	2018	\$5,850,690
		40.02.04	On-Street Drainage Modification Allowance	RM	\$200,000	2.0	\$394,000	30%	\$118,200	\$512,200	2018	\$585,069
		40.06	Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
		40.06.01	Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.07	Automobile, bus, van accessways including roads, parking lots				\$1,000,000		\$300,000	\$1,300,000		\$1,484,947
		40.07.01	Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	2.0	\$1,000,000	30%	\$300,000	\$1,300,000	2018	\$1,484,947
		40.07.02	Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.08	Temporary Facilities and other indirect costs during construction				\$13,943,269		\$0	\$13,943,269		\$15,221,011
		40.08.01	Temporary Maintenance of Traffic	LS	5.0%	63378495.8	\$3,168,925	0%	\$0	\$3,168,925	2018	\$3,619,757
		40.08.02	Contractor Indirects (Staff, Office, etc.)	LS	10.0%	63378495.8	\$6,337,850	0%	\$0	\$6,337,850	2018	\$7,239,514
		40.08.03	Art in Transit (1% of Construction)	LS	1.0%	63378495.8	\$633,785	0%	\$0	\$633,785	2018	\$723,951
<b>50</b>			<b>SYSTEMS</b>				\$10,539,500		\$2,354,150	\$12,893,650		\$14,727,987
		50.02	Traffic signals and crossing protection				\$2,462,500		\$738,750	\$3,201,250		\$3,656,681
		50.02.01	Modify Existing Traffic Signals Allowance	RM	\$1,000,000	2.0	\$1,970,000	30%	\$591,000	\$2,561,000	2018	\$2,925,345
		50.02.02	Streetcar Signal Priority Allowance	RM	\$250,000	2.0	\$492,500	30%	\$147,750	\$640,250	2018	\$731,336
		50.03	Traction power supply: substations				\$2,364,000		\$472,800	\$2,836,800		\$3,240,382
		50.03.02	Streetcar TPSS Allowance	RM	\$1,200,000	2.0	\$2,364,000	20%	\$472,800	\$2,836,800	2018	\$3,240,382
		50.04	Traction power distribution: catenary and third rail				\$5,417,500		\$1,083,500	\$6,501,000		\$7,425,876
		50.04.02	Streetcar OCS Allowance	RM	\$2,750,000	2.0	\$5,417,500	20%	\$1,083,500	\$6,501,000	2018	\$7,425,876
		50.06	Fare collection system and equipment				\$295,500		\$59,100	\$354,600		\$405,048
		50.06.02	Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	3.9	\$295,500	20%	\$59,100	\$354,600	2018	\$405,048
		<b>Construction Subtotal (10-50)</b>				0.0	\$59,366,769		\$10,061,350	\$69,428,119		\$78,599,507


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>												
	60.01	Purchase or lease of real estate						\$985,000	\$295,500	\$1,280,500		\$1,462,672	
								\$985,000	\$295,500	\$1,280,500		\$1,462,672	
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	2.0			\$985,000	30%	\$295,500	\$1,280,500	2018	\$1,462,672
<b>70</b>	<b>VEHICLES (number)</b>							\$17,730,000	\$886,500	\$18,616,500		\$21,265,008	
	70.01	Light Rail						\$17,730,000	\$886,500	\$18,616,500		\$21,265,008	
								\$17,730,000	5%	\$886,500	\$18,616,500	2018	\$21,265,008
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	3.9			\$17,730,000					
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>							\$23,579,852	\$0	\$23,579,852		\$26,934,479	
	80.01	Preliminary Engineering						\$2,357,985	\$0	\$2,357,985		\$2,693,448	
								\$2,357,985	0%	\$0	\$2,357,985	2018	\$2,693,448
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	78599506.5			\$2,357,985		\$0	\$2,357,985	2018	\$2,693,448
	80.02	Final Design						\$6,287,961	\$0	\$6,287,961		\$7,182,528	
								\$6,287,961	0%	\$0	\$6,287,961	2018	\$7,182,528
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	78599506.5			\$6,287,961		\$0	\$6,287,961	2018	\$7,182,528
	80.03	Project Management for Design and Construction						\$4,715,970	\$0	\$4,715,970		\$5,386,896	
								\$4,715,970	0%	\$0	\$4,715,970	2018	\$5,386,896
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	78599506.5			\$4,715,970		\$0	\$4,715,970	2018	\$5,386,896
	80.04	Construction Administration & Management						\$4,715,970	\$0	\$4,715,970		\$5,386,896	
								\$4,715,970	0%	\$0	\$4,715,970	2018	\$5,386,896
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	78599506.5			\$4,715,970		\$0	\$4,715,970	2018	\$5,386,896
	80.05	Professional Liability and other Non-Construction Insurance						\$785,995	\$0	\$785,995		\$897,816	
								\$785,995	0%	\$0	\$785,995	2018	\$897,816
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	78599506.5			\$785,995		\$0	\$785,995	2018	\$897,816
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.						\$1,571,990	\$0	\$1,571,990		\$1,795,632	
								\$1,571,990	0%	\$0	\$1,571,990	2018	\$1,795,632
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	78599506.5			\$1,571,990		\$0	\$1,571,990	2018	\$1,795,632
	80.07	Surveys, Testing, Investigation, Inspection						\$1,571,990	\$0	\$1,571,990		\$1,795,632	
								\$1,571,990	0%	\$0	\$1,571,990	2018	\$1,795,632
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	78599506.5			\$1,571,990		\$0	\$1,571,990	2018	\$1,795,632
	80.08	Start up						\$1,571,990	\$0	\$1,571,990		\$1,795,632	
								\$1,571,990	0%	\$0	\$1,571,990	2018	\$1,795,632
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	78599506.5			\$1,571,990		\$0	\$1,571,990	2018	\$1,795,632
	<b>Subtotal (10-80)</b>						0.0	\$101,661,621	\$11,243,350	\$112,904,971		\$128,261,666	
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%						\$11,290,497		\$12,826,167	
<b>100</b>	<b>FINANCE CHARGES</b>									<i>Current Year Total</i>		<i>YoE Total</i>	
	<b>Segment Totals (10-100)</b>									\$124,195,468		\$141,087,833	




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Rice								Current Year		Inflation Rate	
4.1 Route Miles		Approximately \$64 Million Per Route Mile								2013.50 (YR)		3.00%	
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE	
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$44,863,000</b>		<b>\$9,338,900</b>	<b>\$54,201,900</b>		<b>\$61,913,025</b>	
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0	
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0	
	10.03		Guideway: At-grade in mixed traffic				\$41,200,000		\$8,240,000	\$49,440,000		\$56,473,665	
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	4.1	\$41,200,000	20%	\$8,240,000	\$49,440,000	2018	\$56,473,665	
	10.04		Guideway: Aerial structure				\$663,000		\$198,900	\$861,900		\$984,520	
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0	
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	1.0	\$663,000	30%	\$198,900	\$861,900	2018	\$984,520	
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	10.12		Track: Special (switches, turnouts)				\$3,000,000		\$900,000	\$3,900,000		\$4,454,840	
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	2.0	\$3,000,000	30%	\$900,000	\$3,900,000	2018	\$4,454,840	
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$4,120,000</b>		<b>\$1,236,000</b>	<b>\$5,356,000</b>		<b>\$6,117,980</b>	
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$4,120,000		\$1,236,000	\$5,356,000		\$6,117,980	
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	20.6	\$4,120,000	30%	\$1,236,000	\$5,356,000	2018	\$6,117,980	
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$16,480,000</b>		<b>\$3,296,000</b>	<b>\$19,776,000</b>		<b>\$22,589,466</b>	
	30.02		Light Maintenance Facility				\$16,480,000		\$3,296,000	\$19,776,000		\$22,589,466	
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	4.1	\$16,480,000	20%	\$3,296,000	\$19,776,000	2018	\$22,589,466	
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$39,574,631</b>		<b>\$3,019,200</b>	<b>\$42,593,831</b>		<b>\$47,159,448</b>	
	40.02		Site Utilities, Utility Relocation				\$9,064,000		\$2,719,200	\$11,783,200		\$13,459,557	
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	4.1	\$8,240,000	30%	\$2,472,000	\$10,712,000	2018	\$12,235,961	
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	4.1	\$824,000	30%	\$247,200	\$1,071,200	2018	\$1,223,596	
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0	
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	40.07		Automobile, bus, van accessways including roads, parking lots				\$1,000,000		\$300,000	\$1,300,000		\$1,484,947	
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	1.0	\$1,000,000	30%	\$300,000	\$1,300,000	2018	\$1,484,947	
	40.08		Temporary Facilities and other indirect costs during construction				\$29,510,631		\$0	\$29,510,631		\$32,214,944	
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	134139232.7	\$6,706,962	0%	\$0	\$6,706,962	2018	\$7,661,139	
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	134139232.7	\$13,413,923	0%	\$0	\$13,413,923	2018	\$15,322,278	
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	134139232.7	\$1,341,392	0%	\$0	\$1,341,392	2018	\$1,532,228	
<b>50</b>			<b>SYSTEMS</b>				<b>\$22,042,000</b>		<b>\$4,923,400</b>	<b>\$26,965,400</b>		<b>\$30,801,678</b>	
	50.02		Traffic signals and crossing protection				\$5,150,000		\$1,545,000	\$6,695,000		\$7,647,475	
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	4.1	\$4,120,000	30%	\$1,236,000	\$5,356,000	2018	\$6,117,980	
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	4.1	\$1,030,000	30%	\$309,000	\$1,339,000	2018	\$1,529,495	
	50.03		Traction power supply: substations				\$4,944,000		\$988,800	\$5,932,800		\$6,776,840	
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	4.1	\$4,944,000	20%	\$988,800	\$5,932,800	2018	\$6,776,840	
	50.04		Traction power distribution: catenary and third rail				\$11,330,000		\$2,266,000	\$13,596,000		\$15,530,258	
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	4.1	\$11,330,000	20%	\$2,266,000	\$13,596,000	2018	\$15,530,258	
	50.06		Fare collection system and equipment				\$618,000		\$123,600	\$741,600		\$847,105	
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	8.2	\$618,000	20%	\$123,600	\$741,600	2018	\$847,105	
	<b>Construction Subtotal (10-50)</b>						<b>0.0</b>	<b>\$127,079,631</b>		<b>\$21,813,500</b>	<b>\$148,893,131</b>		<b>\$168,581,597</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>				<b>\$2,060,000</b>		<b>\$618,000</b>	<b>\$2,678,000</b>		<b>\$3,058,990</b>
60.01	Purchase or lease of real estate				\$2,060,000		\$618,000	\$2,678,000		\$3,058,990
60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	4.1	\$2,060,000	30%	\$618,000	\$2,678,000	2018	\$3,058,990
<b>70</b>	<b>VEHICLES (number)</b>				<b>\$37,080,000</b>		<b>\$1,854,000</b>	<b>\$38,934,000</b>		<b>\$44,473,011</b>
70.01	Light Rail				\$37,080,000		\$1,854,000	\$38,934,000		\$44,473,011
70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	8.2	\$37,080,000	5%	\$1,854,000	\$38,934,000	2018	\$44,473,011
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>				<b>\$49,906,253</b>		<b>\$0</b>	<b>\$49,906,253</b>		<b>\$57,006,250</b>
80.01	Preliminary Engineering				\$4,990,625		\$0	\$4,990,625		\$5,700,625
80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	166354176.8	\$4,990,625	0%	\$0	\$4,990,625	2018	\$5,700,625
80.02	Final Design				\$13,308,334		\$0	\$13,308,334		\$15,201,667
80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	166354176.8	\$13,308,334	0%	\$0	\$13,308,334	2018	\$15,201,667
80.03	Project Management for Design and Construction				\$9,981,251		\$0	\$9,981,251		\$11,401,250
80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	166354176.8	\$9,981,251	0%	\$0	\$9,981,251	2018	\$11,401,250
80.04	Construction Administration & Management				\$9,981,251		\$0	\$9,981,251		\$11,401,250
80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	166354176.8	\$9,981,251	0%	\$0	\$9,981,251	2018	\$11,401,250
80.05	Professional Liability and other Non-Construction Insurance				\$1,663,542		\$0	\$1,663,542		\$1,900,208
80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	166354176.8	\$1,663,542	0%	\$0	\$1,663,542	2018	\$1,900,208
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.				\$3,327,084		\$0	\$3,327,084		\$3,800,417
80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	166354176.8	\$3,327,084	0%	\$0	\$3,327,084	2018	\$3,800,417
80.07	Surveys, Testing, Investigation, Inspection				\$3,327,084		\$0	\$3,327,084		\$3,800,417
80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	166354176.8	\$3,327,084	0%	\$0	\$3,327,084	2018	\$3,800,417
80.08	Start up				\$3,327,084		\$0	\$3,327,084		\$3,800,417
80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	166354176.8	\$3,327,084	0%	\$0	\$3,327,084	2018	\$3,800,417
	<b>Subtotal (10-80)</b>			<b>0.0</b>	<b>\$216,125,884</b>		<b>\$24,285,500</b>	<b>\$240,411,384</b>		<b>\$273,119,849</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>	LS	10%					<b>\$24,041,138</b>		<b>\$27,311,985</b>
<b>100</b>	<b>FINANCE CHARGES</b>							<b>Current Year Total</b>		<b>YoE Total</b>
	<b>Segment Totals (10-100)</b>							<b>\$264,452,523</b>		<b>\$300,431,833</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Robert								Current Year		Inflation Rate
2.5 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$26,950,000</b>		<b>\$5,540,000</b>	<b>\$32,490,000</b>		<b>\$37,112,245</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$25,450,000		\$5,090,000	\$30,540,000		<b>\$34,884,825</b>
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	2.5	\$25,450,000	20%	\$5,090,000	\$30,540,000	2018	<b>\$34,884,825</b>
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		<b>\$2,227,420</b>
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	<b>\$2,227,420</b>
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$2,545,000</b>		<b>\$763,500</b>	<b>\$3,308,500</b>		<b>\$3,779,189</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$2,545,000		\$763,500	\$3,308,500		<b>\$3,779,189</b>
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	12.7	\$2,545,000	30%	\$763,500	\$3,308,500	2018	<b>\$3,779,189</b>
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$10,180,000</b>		<b>\$2,036,000</b>	<b>\$12,216,000</b>		<b>\$13,953,930</b>
	30.02		Light Maintenance Facility				\$10,180,000		\$2,036,000	\$12,216,000		<b>\$13,953,930</b>
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	2.5	\$10,180,000	20%	\$2,036,000	\$12,216,000	2018	<b>\$13,953,930</b>
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$23,679,996</b>		<b>\$1,679,700</b>	<b>\$25,359,696</b>		<b>\$28,052,130</b>
	40.02		Site Utilities, Utility Relocation				\$5,599,000		\$1,679,700	\$7,278,700		<b>\$8,314,217</b>
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	2.5	\$5,090,000	30%	\$1,527,000	\$6,617,000	2018	<b>\$7,558,379</b>
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	2.5	\$509,000	30%	\$152,700	\$661,700	2018	<b>\$755,838</b>
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$18,080,996		\$0	\$18,080,996		<b>\$19,737,913</b>
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	82186345.1	\$4,109,317	0%	\$0	\$4,109,317	2018	<b>\$4,693,936</b>
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	82186345.1	\$8,218,635	0%	\$0	\$8,218,635	2018	<b>\$9,387,872</b>
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	82186345.1	\$821,863	0%	\$0	\$821,863	2018	<b>\$938,787</b>
<b>50</b>			<b>SYSTEMS</b>				<b>\$13,615,750</b>		<b>\$3,041,275</b>	<b>\$16,657,025</b>		<b>\$19,026,765</b>
	50.02		Traffic signals and crossing protection				\$3,181,250		\$954,375	\$4,135,625		<b>\$4,723,987</b>
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	2.5	\$2,545,000	30%	\$763,500	\$3,308,500	2018	<b>\$3,779,189</b>
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	2.5	\$636,250	30%	\$190,875	\$827,125	2018	<b>\$944,797</b>
	50.03		Traction power supply: substations				\$3,054,000		\$610,800	\$3,664,800		<b>\$4,186,179</b>
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	2.5	\$3,054,000	20%	\$610,800	\$3,664,800	2018	<b>\$4,186,179</b>
	50.04		Traction power distribution: catenary and third rail				\$6,998,750		\$1,399,750	\$8,398,500		<b>\$9,593,327</b>
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	2.5	\$6,998,750	20%	\$1,399,750	\$8,398,500	2018	<b>\$9,593,327</b>
	50.06		Fare collection system and equipment				\$381,750		\$76,350	\$458,100		<b>\$523,272</b>
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	5.1	\$381,750	20%	\$76,350	\$458,100	2018	<b>\$523,272</b>
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$76,970,746</b>		<b>\$13,060,475</b>	<b>\$90,031,221</b>		<b>\$101,924,258</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>				<b>\$1,272,500</b>	<b>\$381,750</b>	<b>\$1,654,250</b>		<b>\$1,889,595</b>	
60.01	Purchase or lease of real estate				\$1,272,500	\$381,750	\$1,654,250		\$1,889,595	
60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	2.5	\$1,272,500	30%	\$381,750	\$1,654,250	2018	\$1,889,595
<b>70</b>	<b>VEHICLES (number)</b>				<b>\$22,905,000</b>	<b>\$1,145,250</b>	<b>\$24,050,250</b>		<b>\$27,471,799</b>	
70.01	Light Rail				\$22,905,000	\$1,145,250	\$24,050,250		\$27,471,799	
70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	5.1	\$22,905,000	5%	\$1,145,250	\$24,050,250	2018	\$27,471,799
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>				<b>\$30,577,277</b>	<b>\$0</b>	<b>\$30,577,277</b>		<b>\$34,927,405</b>	
80.01	Preliminary Engineering				\$3,057,728	\$0	\$3,057,728		\$3,492,741	
80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	101924258.2	\$3,057,728	0%	\$0	\$3,057,728	2018	\$3,492,741
80.02	Final Design				\$8,153,941	\$0	\$8,153,941		\$9,313,975	
80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	101924258.2	\$8,153,941	0%	\$0	\$8,153,941	2018	\$9,313,975
80.03	Project Management for Design and Construction				\$6,115,455	\$0	\$6,115,455		\$6,985,481	
80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	101924258.2	\$6,115,455	0%	\$0	\$6,115,455	2018	\$6,985,481
80.04	Construction Administration & Management				\$6,115,455	\$0	\$6,115,455		\$6,985,481	
80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	101924258.2	\$6,115,455	0%	\$0	\$6,115,455	2018	\$6,985,481
80.05	Professional Liability and other Non-Construction Insurance				\$1,019,243	\$0	\$1,019,243		\$1,164,247	
80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	101924258.2	\$1,019,243	0%	\$0	\$1,019,243	2018	\$1,164,247
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.				\$2,038,485	\$0	\$2,038,485		\$2,328,494	
80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	101924258.2	\$2,038,485	0%	\$0	\$2,038,485	2018	\$2,328,494
80.07	Surveys, Testing, Investigation, Inspection				\$2,038,485	\$0	\$2,038,485		\$2,328,494	
80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	101924258.2	\$2,038,485	0%	\$0	\$2,038,485	2018	\$2,328,494
80.08	Start up				\$2,038,485	\$0	\$2,038,485		\$2,328,494	
80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	101924258.2	\$2,038,485	0%	\$0	\$2,038,485	2018	\$2,328,494
<b>Subtotal (10-80)</b>					<b>0.0</b>	<b>\$131,725,523</b>	<b>\$14,587,475</b>	<b>\$146,312,998</b>		<b>\$166,213,058</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>	LS	10%					<b>\$14,631,300</b>		<b>\$16,621,306</b>
<b>100</b>	<b>FINANCE CHARGES</b>							<i>Current Year Total</i>		<i>YoE Total</i>
<b>Segment Totals (10-100)</b>								<b>\$160,944,298</b>		<b>\$182,834,363</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Selby + Marshall								Current Year		Inflation Rate
5.9 Route Miles		Approximately \$62 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$60,300,000</b>		<b>\$12,210,000</b>	<b>\$72,510,000</b>		<b>\$82,825,757</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$58,800,000		\$11,760,000	\$70,560,000		\$80,598,337
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	5.9	\$58,800,000	20%	\$11,760,000	\$70,560,000	2018	\$80,598,337
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$5,880,000</b>		<b>\$1,764,000</b>	<b>\$7,644,000</b>		<b>\$8,731,487</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$5,880,000		\$1,764,000	\$7,644,000		\$8,731,487
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	29.4	\$5,880,000	30%	\$1,764,000	\$7,644,000	2018	\$8,731,487
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$23,520,000</b>		<b>\$4,704,000</b>	<b>\$28,224,000</b>		<b>\$32,239,335</b>
	30.02		Light Maintenance Facility				\$23,520,000		\$4,704,000	\$28,224,000		\$32,239,335
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	5.9	\$23,520,000	20%	\$4,704,000	\$28,224,000	2018	\$32,239,335
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$54,068,416</b>		<b>\$3,880,800</b>	<b>\$57,949,216</b>		<b>\$64,111,003</b>
	40.02		Site Utilities, Utility Relocation				\$12,936,000		\$3,880,800	\$16,816,800		\$19,209,270
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	5.9	\$11,760,000	30%	\$3,528,000	\$15,288,000	2018	\$17,462,973
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	5.9	\$1,176,000	30%	\$352,800	\$1,528,800	2018	\$1,746,297
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$41,132,416		\$0	\$41,132,416		\$44,901,733
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	186965525.9	\$9,348,276	0%	\$0	\$9,348,276	2018	\$10,678,225
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	186965525.9	\$18,696,553	0%	\$0	\$18,696,553	2018	\$21,356,449
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	186965525.9	\$1,869,655	0%	\$0	\$1,869,655	2018	\$2,135,645
<b>50</b>			<b>SYSTEMS</b>				<b>\$31,458,000</b>		<b>\$7,026,600</b>	<b>\$38,484,600</b>		<b>\$43,959,677</b>
	50.02		Traffic signals and crossing protection				\$7,350,000		\$2,205,000	\$9,555,000		\$10,914,358
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	5.9	\$5,880,000	30%	\$1,764,000	\$7,644,000	2018	\$8,731,487
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	5.9	\$1,470,000	30%	\$441,000	\$1,911,000	2018	\$2,182,872
	50.03		Traction power supply: substations				\$7,056,000		\$1,411,200	\$8,467,200		\$9,671,800
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	5.9	\$7,056,000	20%	\$1,411,200	\$8,467,200	2018	\$9,671,800
	50.04		Traction power distribution: catenary and third rail				\$16,170,000		\$3,234,000	\$19,404,000		\$22,164,543
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	5.9	\$16,170,000	20%	\$3,234,000	\$19,404,000	2018	\$22,164,543
	50.06		Fare collection system and equipment				\$882,000		\$176,400	\$1,058,400		\$1,208,975
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	11.8	\$882,000	20%	\$176,400	\$1,058,400	2018	\$1,208,975
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$175,226,416</b>		<b>\$29,585,400</b>	<b>\$204,811,816</b>		<b>\$231,867,259</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>												
	60.01	Purchase or lease of real estate											
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	5.9	\$2,940,000	30%	\$882,000	\$3,822,000	2018		\$4,365,743	
<b>70</b>	<b>VEHICLES (number)</b>												
	70.01	Light Rail											
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	11.8	\$52,920,000	5%	\$2,646,000	\$55,566,000	2018		\$63,471,191	
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>												
	80.01	Preliminary Engineering											
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	231867258.6	\$6,956,018	0%	\$0	\$6,956,018	2018		\$7,945,627	
	80.02	Final Design											
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	231867258.6	\$18,549,381	0%	\$0	\$18,549,381	2018		\$21,188,340	
	80.03	Project Management for Design and Construction											
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	231867258.6	\$13,912,036	0%	\$0	\$13,912,036	2018		\$15,891,255	
	80.04	Construction Administration & Management											
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	231867258.6	\$13,912,036	0%	\$0	\$13,912,036	2018		\$15,891,255	
	80.05	Professional Liability and other Non-Construction Insurance											
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	231867258.6	\$2,318,673	0%	\$0	\$2,318,673	2018		\$2,648,542	
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.											
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	231867258.6	\$4,637,345	0%	\$0	\$4,637,345	2018		\$5,297,085	
	80.07	Surveys, Testing, Investigation, Inspection											
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	231867258.6	\$4,637,345	0%	\$0	\$4,637,345	2018		\$5,297,085	
	80.08	Start up											
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	231867258.6	\$4,637,345	0%	\$0	\$4,637,345	2018		\$5,297,085	
	<b>Subtotal (10-80)</b>				0.0	\$300,646,593		\$33,113,400	\$333,759,993			\$379,160,466	
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%					\$33,375,999			\$37,916,047	
<b>100</b>	<b>FINANCE CHARGES</b>												
	<b>Segment Totals (10-100)</b>											\$367,135,993	\$417,076,513






**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Selby + Snelling								Current Year		Inflation Rate
5.1 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$52,700,000</b>		<b>\$10,690,000</b>	<b>\$63,390,000</b>		<b>\$72,408,285</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$51,200,000		\$10,240,000	\$61,440,000		<b>\$70,180,865</b>
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	5.1	\$51,200,000	20%	\$10,240,000	\$61,440,000	2018	<b>\$70,180,865</b>
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		<b>\$2,227,420</b>
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	<b>\$2,227,420</b>
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$5,120,000</b>		<b>\$1,536,000</b>	<b>\$6,656,000</b>		<b>\$7,602,927</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$5,120,000		\$1,536,000	\$6,656,000		<b>\$7,602,927</b>
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	25.6	\$5,120,000	30%	\$1,536,000	\$6,656,000	2018	<b>\$7,602,927</b>
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$20,480,000</b>		<b>\$4,096,000</b>	<b>\$24,576,000</b>		<b>\$28,072,346</b>
	30.02		Light Maintenance Facility				\$20,480,000		\$4,096,000	\$24,576,000		<b>\$28,072,346</b>
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	5.1	\$20,480,000	20%	\$4,096,000	\$24,576,000	2018	<b>\$28,072,346</b>
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$47,143,319</b>		<b>\$3,379,200</b>	<b>\$50,522,519</b>		<b>\$55,893,689</b>
	40.02		Site Utilities, Utility Relocation				\$11,264,000		\$3,379,200	\$14,643,200		<b>\$16,726,440</b>
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	5.1	\$10,240,000	30%	\$3,072,000	\$13,312,000	2018	<b>\$15,205,854</b>
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	5.1	\$1,024,000	30%	\$307,200	\$1,331,200	2018	<b>\$1,520,585</b>
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$35,879,319		\$0	\$35,879,319		<b>\$39,167,249</b>
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	163087811.6	\$8,154,391	0%	\$0	\$8,154,391	2018	<b>\$9,314,489</b>
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	163087811.6	\$16,308,781	0%	\$0	\$16,308,781	2018	<b>\$18,628,977</b>
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	163087811.6	\$1,630,878	0%	\$0	\$1,630,878	2018	<b>\$1,862,898</b>
<b>50</b>			<b>SYSTEMS</b>				<b>\$27,392,000</b>		<b>\$6,118,400</b>	<b>\$33,510,400</b>		<b>\$38,277,814</b>
	50.02		Traffic signals and crossing protection				\$6,400,000		\$1,920,000	\$8,320,000		<b>\$9,503,659</b>
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	5.1	\$5,120,000	30%	\$1,536,000	\$6,656,000	2018	<b>\$7,602,927</b>
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	5.1	\$1,280,000	30%	\$384,000	\$1,664,000	2018	<b>\$1,900,732</b>
	50.03		Traction power supply: substations				\$6,144,000		\$1,228,800	\$7,372,800		<b>\$8,421,704</b>
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	5.1	\$6,144,000	20%	\$1,228,800	\$7,372,800	2018	<b>\$8,421,704</b>
	50.04		Traction power distribution: catenary and third rail				\$14,080,000		\$2,816,000	\$16,896,000		<b>\$19,299,738</b>
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	5.1	\$14,080,000	20%	\$2,816,000	\$16,896,000	2018	<b>\$19,299,738</b>
	50.06		Fare collection system and equipment				\$768,000		\$153,600	\$921,600		<b>\$1,052,713</b>
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	10.2	\$768,000	20%	\$153,600	\$921,600	2018	<b>\$1,052,713</b>
	<b>Construction Subtotal (10-50)</b>					<b>0.0</b>	<b>\$152,835,319</b>		<b>\$25,819,600</b>	<b>\$178,654,919</b>		<b>\$202,255,061</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>				<b>\$2,560,000</b>	<b>\$768,000</b>	<b>\$3,328,000</b>		<b>\$3,801,464</b>	
60.01	Purchase or lease of real estate				\$2,560,000	\$768,000	\$3,328,000		\$3,801,464	
60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	5.1	\$2,560,000	30%	\$768,000	\$3,328,000	2018	\$3,801,464
<b>70</b>	<b>VEHICLES (number)</b>				<b>\$46,080,000</b>	<b>\$2,304,000</b>	<b>\$48,384,000</b>		<b>\$55,267,431</b>	
70.01	Light Rail				\$46,080,000	\$2,304,000	\$48,384,000		\$55,267,431	
70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	10.2	\$46,080,000	5%	\$2,304,000	\$48,384,000	2018	\$55,267,431
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>				<b>\$60,676,518</b>	<b>\$0</b>	<b>\$60,676,518</b>		<b>\$69,308,765</b>	
80.01	Preliminary Engineering				\$6,067,652	\$0	\$6,067,652		\$6,930,877	
80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	202255060.6	\$6,067,652	0%	\$0	\$6,067,652	2018	\$6,930,877
80.02	Final Design				\$16,180,405	\$0	\$16,180,405		\$18,482,337	
80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	202255060.6	\$16,180,405	0%	\$0	\$16,180,405	2018	\$18,482,337
80.03	Project Management for Design and Construction				\$12,135,304	\$0	\$12,135,304		\$13,861,753	
80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	202255060.6	\$12,135,304	0%	\$0	\$12,135,304	2018	\$13,861,753
80.04	Construction Administration & Management				\$12,135,304	\$0	\$12,135,304		\$13,861,753	
80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	202255060.6	\$12,135,304	0%	\$0	\$12,135,304	2018	\$13,861,753
80.05	Professional Liability and other Non-Construction Insurance				\$2,022,551	\$0	\$2,022,551		\$2,310,292	
80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	202255060.6	\$2,022,551	0%	\$0	\$2,022,551	2018	\$2,310,292
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.				\$4,045,101	\$0	\$4,045,101		\$4,620,584	
80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	202255060.6	\$4,045,101	0%	\$0	\$4,045,101	2018	\$4,620,584
80.07	Surveys, Testing, Investigation, Inspection				\$4,045,101	\$0	\$4,045,101		\$4,620,584	
80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	202255060.6	\$4,045,101	0%	\$0	\$4,045,101	2018	\$4,620,584
80.08	Start up				\$4,045,101	\$0	\$4,045,101		\$4,620,584	
80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	202255060.6	\$4,045,101	0%	\$0	\$4,045,101	2018	\$4,620,584
	<b>Subtotal (10-80)</b>			<b>0.0</b>	<b>\$262,151,837</b>		<b>\$28,891,600</b>	<b>\$291,043,437</b>		<b>\$330,632,721</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>	LS	10%					<b>\$29,104,344</b>		<b>\$33,063,272</b>
<b>100</b>	<b>FINANCE CHARGES</b>							<i>Current Year Total</i>		<i>YoE Total</i>
	<b>Segment Totals (10-100)</b>							<b>\$320,147,780</b>		<b>\$363,695,993</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Snelling + Ford								Current Year		Inflation Rate	
5.3 Route Miles		Approximately \$62 Million Per Route Mile								2013.50 (YR)		3.00%	
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE	
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$53,263,000</b>		<b>\$10,718,900</b>	<b>\$63,981,900</b>		<b>\$73,084,393</b>	
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0	
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0	
	10.03		Guideway: At-grade in mixed traffic				\$52,600,000		\$10,520,000	\$63,120,000		\$72,099,873	
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	5.3	\$52,600,000	20%	\$10,520,000	\$63,120,000	2018	\$72,099,873	
	10.04		Guideway: Aerial structure				\$663,000		\$198,900	\$861,900		\$984,520	
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0	
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	1.0	\$663,000	30%	\$198,900	\$861,900	2018	\$984,520	
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	10.12		Track: Special (switches, turnouts)				\$0		\$0	\$0		\$0	
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$5,260,000</b>		<b>\$1,578,000</b>	<b>\$6,838,000</b>		<b>\$7,810,820</b>	
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$5,260,000		\$1,578,000	\$6,838,000		\$7,810,820	
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	26.3	\$5,260,000	30%	\$1,578,000	\$6,838,000	2018	\$7,810,820	
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$21,040,000</b>		<b>\$4,208,000</b>	<b>\$25,248,000</b>		<b>\$28,839,949</b>	
	30.02		Light Maintenance Facility				\$21,040,000		\$4,208,000	\$25,248,000		\$28,839,949	
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	5.3	\$21,040,000	20%	\$4,208,000	\$25,248,000	2018	\$28,839,949	
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$48,145,556</b>		<b>\$3,471,600</b>	<b>\$51,617,156</b>		<b>\$57,108,909</b>	
	40.02		Site Utilities, Utility Relocation				\$11,572,000		\$3,471,600	\$15,043,600		\$17,183,803	
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	5.3	\$10,520,000	30%	\$3,156,000	\$13,676,000	2018	\$15,621,639	
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	5.3	\$1,052,000	30%	\$315,600	\$1,367,600	2018	\$1,562,164	
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0	
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0	
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0	
	40.08		Temporary Facilities and other indirect costs during construction				\$36,573,556		\$0	\$36,573,556		\$39,925,106	
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	166243437.5	\$8,312,172	0%	\$0	\$8,312,172	2018	\$9,494,717	
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	166243437.5	\$16,624,344	0%	\$0	\$16,624,344	2018	\$18,989,434	
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	166243437.5	\$1,662,434	0%	\$0	\$1,662,434	2018	\$1,898,943	
<b>50</b>			<b>SYSTEMS</b>				<b>\$28,141,000</b>		<b>\$6,285,700</b>	<b>\$34,426,700</b>		<b>\$39,324,473</b>	
	50.02		Traffic signals and crossing protection				\$6,575,000		\$1,972,500	\$8,547,500		\$9,763,525	
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	5.3	\$5,260,000	30%	\$1,578,000	\$6,838,000	2018	\$7,810,820	
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	5.3	\$1,315,000	30%	\$394,500	\$1,709,500	2018	\$1,952,705	
	50.03		Traction power supply: substations				\$6,312,000		\$1,262,400	\$7,574,400		\$8,651,985	
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	5.3	\$6,312,000	20%	\$1,262,400	\$7,574,400	2018	\$8,651,985	
	50.04		Traction power distribution: catenary and third rail				\$14,465,000		\$2,893,000	\$17,358,000		\$19,827,465	
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	5.3	\$14,465,000	20%	\$2,893,000	\$17,358,000	2018	\$19,827,465	
	50.06		Fare collection system and equipment				\$789,000		\$157,800	\$946,800		\$1,081,498	
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	10.5	\$789,000	20%	\$157,800	\$946,800	2018	\$1,081,498	
	<b>Construction Subtotal (10-50)</b>						<b>0.0</b>	<b>\$155,849,556</b>		<b>\$26,262,200</b>	<b>\$182,111,756</b>		<b>\$206,168,543</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>											
	60.01	Purchase or lease of real estate										
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	5.3	\$2,630,000	30%	\$789,000	\$3,419,000	2018	\$3,905,410	
<b>70</b>	<b>VEHICLES (number)</b>											
	70.01	Light Rail										
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	10.5	\$47,340,000	5%	\$2,367,000	\$49,707,000	2018	\$56,778,650	
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>											
	80.01	Preliminary Engineering										
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	206168543.3	\$6,185,056	0%	\$0	\$6,185,056	2018	\$7,064,984	
	80.02	Final Design										
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	206168543.3	\$16,493,483	0%	\$0	\$16,493,483	2018	\$18,839,957	
	80.03	Project Management for Design and Construction										
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	206168543.3	\$12,370,113	0%	\$0	\$12,370,113	2018	\$14,129,968	
	80.04	Construction Administration & Management										
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	206168543.3	\$12,370,113	0%	\$0	\$12,370,113	2018	\$14,129,968	
	80.05	Professional Liability and other Non-Construction Insurance										
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	206168543.3	\$2,061,685	0%	\$0	\$2,061,685	2018	\$2,354,995	
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.										
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	206168543.3	\$4,123,371	0%	\$0	\$4,123,371	2018	\$4,709,989	
	80.07	Surveys, Testing, Investigation, Inspection										
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	206168543.3	\$4,123,371	0%	\$0	\$4,123,371	2018	\$4,709,989	
	80.08	Start up										
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	206168543.3	\$4,123,371	0%	\$0	\$4,123,371	2018	\$4,709,989	
	<b>Subtotal (10-80)</b>											
						\$267,670,119		\$29,418,200	\$297,088,319		\$337,502,441	
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%					\$29,708,832		\$33,750,244	
<b>100</b>	<b>FINANCE CHARGES</b>								<i>Current Year Total</i>		<i>YoE Total</i>	
	<b>Segment Totals (10-100)</b>								\$326,797,151		\$371,252,685	




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Snelling North								Current Year		Inflation Rate
2.5 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$26,226,000</b>		<b>\$5,377,800</b>	<b>\$31,603,800</b>		<b>\$36,099,968</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$24,900,000		\$4,980,000	\$29,880,000		<b>\$34,130,929</b>
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	2.5	\$24,900,000	20%	\$4,980,000	\$29,880,000	2018	<b>\$34,130,929</b>
	10.04		Guideway: Aerial structure				\$1,326,000		\$397,800	\$1,723,800		<b>\$1,969,039</b>
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	2.0	\$663,000	30%	\$198,900	\$861,900	2018	<b>\$984,520</b>
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	1.0	\$663,000	30%	\$198,900	\$861,900	2018	<b>\$984,520</b>
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$0		\$0	\$0		\$0
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$2,490,000</b>		<b>\$747,000</b>	<b>\$3,237,000</b>		<b>\$3,697,517</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$2,490,000		\$747,000	\$3,237,000		<b>\$3,697,517</b>
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	12.5	\$2,490,000	30%	\$747,000	\$3,237,000	2018	<b>\$3,697,517</b>
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$9,960,000</b>		<b>\$1,992,000</b>	<b>\$11,952,000</b>		<b>\$13,652,371</b>
	30.02		Light Maintenance Facility				\$9,960,000		\$1,992,000	\$11,952,000		<b>\$13,652,371</b>
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	2.5	\$9,960,000	20%	\$1,992,000	\$11,952,000	2018	<b>\$13,652,371</b>
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$23,121,994</b>		<b>\$1,643,400</b>	<b>\$24,765,394</b>		<b>\$27,395,403</b>
	40.02		Site Utilities, Utility Relocation				\$5,478,000		\$1,643,400	\$7,121,400		<b>\$8,134,538</b>
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	2.5	\$4,980,000	30%	\$1,494,000	\$6,474,000	2018	<b>\$7,395,035</b>
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	2.5	\$498,000	30%	\$149,400	\$647,400	2018	<b>\$739,503</b>
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$17,643,994		\$0	\$17,643,994		<b>\$19,260,865</b>
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	80199971.9	\$4,009,999	0%	\$0	\$4,009,999	2018	<b>\$4,580,488</b>
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	80199971.9	\$8,019,997	0%	\$0	\$8,019,997	2018	<b>\$9,160,976</b>
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	80199971.9	\$802,000	0%	\$0	\$802,000	2018	<b>\$916,098</b>
<b>50</b>			<b>SYSTEMS</b>				<b>\$13,321,500</b>		<b>\$2,975,550</b>	<b>\$16,297,050</b>		<b>\$18,615,577</b>
	50.02		Traffic signals and crossing protection				\$3,112,500		\$933,750	\$4,046,250		<b>\$4,621,897</b>
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	2.5	\$2,490,000	30%	\$747,000	\$3,237,000	2018	<b>\$3,697,517</b>
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	2.5	\$622,500	30%	\$186,750	\$809,250	2018	<b>\$924,379</b>
	50.03		Traction power supply: substations				\$2,988,000		\$597,600	\$3,585,600		<b>\$4,095,711</b>
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	2.5	\$2,988,000	20%	\$597,600	\$3,585,600	2018	<b>\$4,095,711</b>
	50.04		Traction power distribution: catenary and third rail				\$6,847,500		\$1,369,500	\$8,217,000		<b>\$9,386,005</b>
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	2.5	\$6,847,500	20%	\$1,369,500	\$8,217,000	2018	<b>\$9,386,005</b>
	50.06		Fare collection system and equipment				\$373,500		\$74,700	\$448,200		<b>\$511,964</b>
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	5.0	\$373,500	20%	\$74,700	\$448,200	2018	<b>\$511,964</b>
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$75,119,494</b>		<b>\$12,735,750</b>	<b>\$87,855,244</b>		<b>\$99,460,837</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>				<b>\$1,245,000</b>	<b>\$373,500</b>	<b>\$1,618,500</b>		<b>\$1,848,759</b>	
60.01	Purchase or lease of real estate				\$1,245,000	\$373,500	\$1,618,500		\$1,848,759	
60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	2.5	\$1,245,000	30%	\$373,500	\$1,618,500	2018	\$1,848,759
<b>70</b>	<b>VEHICLES (number)</b>				<b>\$22,410,000</b>	<b>\$1,120,500</b>	<b>\$23,530,500</b>		<b>\$26,878,106</b>	
70.01	Light Rail				\$22,410,000	\$1,120,500	\$23,530,500		\$26,878,106	
70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	5.0	\$22,410,000	5%	\$1,120,500	\$23,530,500	2018	\$26,878,106
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>				<b>\$29,838,251</b>	<b>\$0</b>	<b>\$29,838,251</b>		<b>\$34,083,240</b>	
80.01	Preliminary Engineering				\$2,983,825	\$0	\$2,983,825		\$3,408,324	
80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	99460836.6	\$2,983,825	0%	\$0	\$2,983,825	2018	\$3,408,324
80.02	Final Design				\$7,956,867	\$0	\$7,956,867		\$9,088,864	
80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	99460836.6	\$7,956,867	0%	\$0	\$7,956,867	2018	\$9,088,864
80.03	Project Management for Design and Construction				\$5,967,650	\$0	\$5,967,650		\$6,816,648	
80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	99460836.6	\$5,967,650	0%	\$0	\$5,967,650	2018	\$6,816,648
80.04	Construction Administration & Management				\$5,967,650	\$0	\$5,967,650		\$6,816,648	
80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	99460836.6	\$5,967,650	0%	\$0	\$5,967,650	2018	\$6,816,648
80.05	Professional Liability and other Non-Construction Insurance				\$994,608	\$0	\$994,608		\$1,136,108	
80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	99460836.6	\$994,608	0%	\$0	\$994,608	2018	\$1,136,108
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.				\$1,989,217	\$0	\$1,989,217		\$2,272,216	
80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	99460836.6	\$1,989,217	0%	\$0	\$1,989,217	2018	\$2,272,216
80.07	Surveys, Testing, Investigation, Inspection				\$1,989,217	\$0	\$1,989,217		\$2,272,216	
80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	99460836.6	\$1,989,217	0%	\$0	\$1,989,217	2018	\$2,272,216
80.08	Start up				\$1,989,217	\$0	\$1,989,217		\$2,272,216	
80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	99460836.6	\$1,989,217	0%	\$0	\$1,989,217	2018	\$2,272,216
	<b>Subtotal (10-80)</b>				<b>\$128,612,745</b>	<b>\$14,229,750</b>	<b>\$142,842,495</b>		<b>\$162,270,942</b>	
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>	LS	10%					<b>\$14,284,249</b>	<b>\$16,227,094</b>	
<b>100</b>	<b>FINANCE CHARGES</b>							<i>Current Year Total</i>	<i>YoE Total</i>	
	<b>Segment Totals (10-100)</b>							<b>\$157,126,744</b>	<b>\$178,498,036</b>	






**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		Wabasha								Current Year		Inflation Rate
2.4 Route Miles		Approximately \$63 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$25,400,000</b>		<b>\$5,230,000</b>	<b>\$30,630,000</b>		<b>\$34,987,629</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$23,900,000		\$4,780,000	\$28,680,000		\$32,760,209
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	2.4	\$23,900,000	20%	\$4,780,000	\$28,680,000	2018	\$32,760,209
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$2,390,000</b>		<b>\$717,000</b>	<b>\$3,107,000</b>		<b>\$3,549,023</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$2,390,000		\$717,000	\$3,107,000		\$3,549,023
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	12.0	\$2,390,000	30%	\$717,000	\$3,107,000	2018	\$3,549,023
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$9,560,000</b>		<b>\$1,912,000</b>	<b>\$11,472,000</b>		<b>\$13,104,083</b>
	30.02		Light Maintenance Facility				\$9,560,000		\$1,912,000	\$11,472,000		\$13,104,083
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	2.4	\$9,560,000	20%	\$1,912,000	\$11,472,000	2018	\$13,104,083
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$22,267,641</b>		<b>\$1,577,400</b>	<b>\$23,845,041</b>		<b>\$26,376,230</b>
	40.02		Site Utilities, Utility Relocation				\$5,258,000		\$1,577,400	\$6,835,400		\$7,807,850
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	2.4	\$4,780,000	30%	\$1,434,000	\$6,214,000	2018	\$7,098,045
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	2.4	\$478,000	30%	\$143,400	\$621,400	2018	\$709,805
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$17,009,641		\$0	\$17,009,641		\$18,568,380
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	77316548.1	\$3,865,827	0%	\$0	\$3,865,827	2018	\$4,415,806
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	77316548.1	\$7,731,655	0%	\$0	\$7,731,655	2018	\$8,831,612
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	77316548.1	\$773,165	0%	\$0	\$773,165	2018	\$883,161
<b>50</b>			<b>SYSTEMS</b>				<b>\$12,786,500</b>		<b>\$2,856,050</b>	<b>\$15,642,550</b>		<b>\$17,867,964</b>
	50.02		Traffic signals and crossing protection				\$2,987,500		\$896,250	\$3,883,750		\$4,436,278
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	2.4	\$2,390,000	30%	\$717,000	\$3,107,000	2018	\$3,549,023
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	2.4	\$597,500	30%	\$179,250	\$776,750	2018	\$887,256
	50.03		Traction power supply: substations				\$2,868,000		\$573,600	\$3,441,600		\$3,931,225
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	2.4	\$2,868,000	20%	\$573,600	\$3,441,600	2018	\$3,931,225
	50.04		Traction power distribution: catenary and third rail				\$6,572,500		\$1,314,500	\$7,887,000		\$9,009,057
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	2.4	\$6,572,500	20%	\$1,314,500	\$7,887,000	2018	\$9,009,057
	50.06		Fare collection system and equipment				\$358,500		\$71,700	\$430,200		\$491,403
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	4.8	\$358,500	20%	\$71,700	\$430,200	2018	\$491,403
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$72,404,141</b>		<b>\$12,292,450</b>	<b>\$84,696,591</b>		<b>\$95,884,928</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>						<b>\$1,195,000</b>	<b>\$358,500</b>	<b>\$1,553,500</b>		<b>\$1,774,511</b>	
60.01	Purchase or lease of real estate						\$1,195,000	\$358,500	\$1,553,500		\$1,774,511	
60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	2.4			\$1,195,000	30%	\$358,500	\$1,553,500	2018	\$1,774,511
<b>70</b>	<b>VEHICLES (number)</b>						<b>\$21,510,000</b>	<b>\$1,075,500</b>	<b>\$22,585,500</b>		<b>\$25,798,664</b>	
70.01	Light Rail						\$21,510,000	\$1,075,500	\$22,585,500		\$25,798,664	
70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	4.8			\$21,510,000	5%	\$1,075,500	\$22,585,500	2018	\$25,798,664
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>						<b>\$28,765,479</b>	<b>\$0</b>	<b>\$28,765,479</b>		<b>\$32,857,848</b>	
80.01	Preliminary Engineering						\$2,876,548	\$0	\$2,876,548		\$3,285,785	
80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	95884928.3			\$2,876,548	0%	\$0	\$2,876,548	2018	\$3,285,785
80.02	Final Design						\$7,670,794	\$0	\$7,670,794		\$8,762,093	
80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	95884928.3			\$7,670,794	0%	\$0	\$7,670,794	2018	\$8,762,093
80.03	Project Management for Design and Construction						\$5,753,096	\$0	\$5,753,096		\$6,571,570	
80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	95884928.3			\$5,753,096	0%	\$0	\$5,753,096	2018	\$6,571,570
80.04	Construction Administration & Management						\$5,753,096	\$0	\$5,753,096		\$6,571,570	
80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	95884928.3			\$5,753,096	0%	\$0	\$5,753,096	2018	\$6,571,570
80.05	Professional Liability and other Non-Construction Insurance						\$958,849	\$0	\$958,849		\$1,095,262	
80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	95884928.3			\$958,849	0%	\$0	\$958,849	2018	\$1,095,262
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.						\$1,917,699	\$0	\$1,917,699		\$2,190,523	
80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	95884928.3			\$1,917,699	0%	\$0	\$1,917,699	2018	\$2,190,523
80.07	Surveys, Testing, Investigation, Inspection						\$1,917,699	\$0	\$1,917,699		\$2,190,523	
80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	95884928.3			\$1,917,699	0%	\$0	\$1,917,699	2018	\$2,190,523
80.08	Start up						\$1,917,699	\$0	\$1,917,699		\$2,190,523	
80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	95884928.3			\$1,917,699	0%	\$0	\$1,917,699	2018	\$2,190,523
	<b>Subtotal (10-80)</b>						<b>\$123,874,619</b>	<b>\$13,726,450</b>	<b>\$137,601,069</b>		<b>\$156,315,952</b>	
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>	LS	10%							<b>\$13,760,107</b>	<b>\$15,631,595</b>	
<b>100</b>	<b>FINANCE CHARGES</b>									<i>Current Year Total</i>	<i>YoE Total</i>	
	<b>Segment Totals (10-100)</b>									<b>\$151,361,176</b>	<b>\$171,947,547</b>	




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		West 7th								Current Year		Inflation Rate
5.9 Route Miles		Approximately \$62 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$60,900,000</b>		<b>\$12,330,000</b>	<b>\$73,230,000</b>		<b>\$83,648,189</b>
	10.01		Guideway: At-grade exclusive right-of-way				\$0		\$0	\$0		\$0
	10.01.01		Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	0.0	\$0	20%	\$0	\$0	2018	\$0
	10.03		Guideway: At-grade in mixed traffic				\$59,400,000		\$11,880,000	\$71,280,000		\$81,420,769
	10.03.01		Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	5.9	\$59,400,000	20%	\$11,880,000	\$71,280,000	2018	\$81,420,769
	10.04		Guideway: Aerial structure				\$0		\$0	\$0		\$0
	10.04.01		Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.02		Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.04.03		Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	10.12		Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
	10.12.01		At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
	10.12.02		At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$5,940,000</b>		<b>\$1,782,000</b>	<b>\$7,722,000</b>		<b>\$8,820,583</b>
	20.01		At-grade station, stop, shelter, mall, terminal, platform				\$5,940,000		\$1,782,000	\$7,722,000		\$8,820,583
	20.01.04		Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	29.7	\$5,940,000	30%	\$1,782,000	\$7,722,000	2018	\$8,820,583
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$23,760,000</b>		<b>\$4,752,000</b>	<b>\$28,512,000</b>		<b>\$32,568,308</b>
	30.02		Light Maintenance Facility				\$23,760,000		\$4,752,000	\$28,512,000		\$32,568,308
	30.02.03		Streetcar MSF Allowance	RM	\$4,000,000	5.9	\$23,760,000	20%	\$4,752,000	\$28,512,000	2018	\$32,568,308
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$54,615,134</b>		<b>\$3,920,400</b>	<b>\$58,535,534</b>		<b>\$64,759,738</b>
	40.02		Site Utilities, Utility Relocation				\$13,068,000		\$3,920,400	\$16,988,400		\$19,405,283
	40.02.02		Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	5.9	\$11,880,000	30%	\$3,564,000	\$15,444,000	2018	\$17,641,167
	40.02.04		On-Street Drainage Modification Allowance	RM	\$200,000	5.9	\$1,188,000	30%	\$356,400	\$1,544,400	2018	\$1,764,117
	40.06		Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
	40.06.01		Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07		Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
	40.07.01		Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.07.02		Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
	40.08		Temporary Facilities and other indirect costs during construction				\$41,547,134		\$0	\$41,547,134		\$45,354,455
	40.08.01		Temporary Maintenance of Traffic	LS	5.0%	188850608.7	\$9,442,530	0%	\$0	\$9,442,530	2018	\$10,785,888
	40.08.02		Contractor Indirects (Staff, Office, etc.)	LS	10.0%	188850608.7	\$18,885,061	0%	\$0	\$18,885,061	2018	\$21,571,776
	40.08.03		Art in Transit (1% of Construction)	LS	1.0%	188850608.7	\$1,888,506	0%	\$0	\$1,888,506	2018	\$2,157,178
<b>50</b>			<b>SYSTEMS</b>				<b>\$31,779,000</b>		<b>\$7,098,300</b>	<b>\$38,877,300</b>		<b>\$44,408,245</b>
	50.02		Traffic signals and crossing protection				\$7,425,000		\$2,227,500	\$9,652,500		\$11,025,729
	50.02.01		Modify Existing Traffic Signals Allowance	RM	\$1,000,000	5.9	\$5,940,000	30%	\$1,782,000	\$7,722,000	2018	\$8,820,583
	50.02.02		Streetcar Signal Priority Allowance	RM	\$250,000	5.9	\$1,485,000	30%	\$445,500	\$1,930,500	2018	\$2,205,146
	50.03		Traction power supply: substations				\$7,128,000		\$1,425,600	\$8,553,600		\$9,770,492
	50.03.02		Streetcar TPSS Allowance	RM	\$1,200,000	5.9	\$7,128,000	20%	\$1,425,600	\$8,553,600	2018	\$9,770,492
	50.04		Traction power distribution: catenary and third rail				\$16,335,000		\$3,267,000	\$19,602,000		\$22,390,712
	50.04.02		Streetcar OCS Allowance	RM	\$2,750,000	5.9	\$16,335,000	20%	\$3,267,000	\$19,602,000	2018	\$22,390,712
	50.06		Fare collection system and equipment				\$891,000		\$178,200	\$1,069,200		\$1,221,312
	50.06.02		Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	11.9	\$891,000	20%	\$178,200	\$1,069,200	2018	\$1,221,312
	<b>Construction Subtotal (10-50)</b>					0.0	<b>\$176,994,134</b>		<b>\$29,882,700</b>	<b>\$206,876,834</b>		<b>\$234,205,064</b>


**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>											
	60.01	Purchase or lease of real estate										
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	5.9	\$2,970,000	30%	\$891,000	\$3,861,000	2018	\$4,410,292	
<b>70</b>	<b>VEHICLES (number)</b>											
	70.01	Light Rail										
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	11.9	\$53,460,000	5%	\$2,673,000	\$56,133,000	2018	\$64,118,856	
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>											
	80.01	Preliminary Engineering										
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	234205063.7	\$7,026,152	0%	\$0	\$7,026,152	2018	\$8,025,739	
	80.02	Final Design										
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	234205063.7	\$18,736,405	0%	\$0	\$18,736,405	2018	\$21,401,971	
	80.03	Project Management for Design and Construction										
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	234205063.7	\$14,052,304	0%	\$0	\$14,052,304	2018	\$16,051,479	
	80.04	Construction Administration & Management										
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	234205063.7	\$14,052,304	0%	\$0	\$14,052,304	2018	\$16,051,479	
	80.05	Professional Liability and other Non-Construction Insurance										
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	234205063.7	\$2,342,051	0%	\$0	\$2,342,051	2018	\$2,675,246	
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.										
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	234205063.7	\$4,684,101	0%	\$0	\$4,684,101	2018	\$5,350,493	
	80.07	Surveys, Testing, Investigation, Inspection										
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	234205063.7	\$4,684,101	0%	\$0	\$4,684,101	2018	\$5,350,493	
	80.08	Start up										
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	234205063.7	\$4,684,101	0%	\$0	\$4,684,101	2018	\$5,350,493	
	<b>Subtotal (10-80)</b>					\$303,685,653		\$33,446,700	\$337,132,353		\$382,991,604	
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%					\$33,713,235		\$38,299,160	
<b>100</b>	<b>FINANCE CHARGES</b>								<i>Current Year Total</i>		<i>YoE Total</i>	
	<b>Segment Totals (10-100)</b>								\$370,845,588		\$421,290,764	




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

Streetcar Line		West 7th + Ford Spur								Current Year		Inflation Rate
7.4 Route Miles		Approximately \$59 Million Per Route Mile								2013.50 (YR)		3.00%
SCC	SCC Sub	Item #	Item Description	Unit	Unit Cost	Quantity	Item Cost	A. Cont.	Item Cont.	Subtotal	YoE	Subtotal YoE
<b>10</b>			<b>GUIDEWAY &amp; TRACK ELEMENTS (Route Miles)</b>				<b>\$71,440,000</b>		<b>\$14,438,000</b>	<b>\$85,878,000</b>		<b>\$98,095,579</b>
		10.01	Guideway: At-grade exclusive right-of-way				\$16,640,000		\$3,328,000	\$19,968,000		\$22,808,781
		10.01.01	Streetcar Guideway (Double Track/Ballasted)	RM	\$8,000,000	2.1	\$16,640,000	20%	\$3,328,000	\$19,968,000	2018	\$22,808,781
		10.03	Guideway: At-grade in mixed traffic				\$53,300,000		\$10,660,000	\$63,960,000		\$73,059,377
		10.03.01	Streetcar Guideway (2-Way/Double Track)	RM	\$10,000,000	5.3	\$53,300,000	20%	\$10,660,000	\$63,960,000	2018	\$73,059,377
		10.04	Guideway: Aerial structure				\$0		\$0	\$0		\$0
		10.04.01	Existing Structure Rehab Allowance - Low	EA	\$331,500	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.04.02	Existing Structure Rehab Allowance - Medium	EA	\$663,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.04.03	Existing Structure Rehab Allowance - High	EA	\$1,326,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		10.12	Track: Special (switches, turnouts)				\$1,500,000		\$450,000	\$1,950,000		\$2,227,420
		10.12.01	At - Grade Streetcar/LRT Interface Allowance (Including Systems)	EA	\$1,500,000	1.0	\$1,500,000	30%	\$450,000	\$1,950,000	2018	\$2,227,420
		10.12.02	At - Grade Streetcar/RR Interface Allowance (Including Systems)	EA	\$3,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
<b>20</b>			<b>STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>				<b>\$7,410,000</b>		<b>\$2,223,000</b>	<b>\$9,633,000</b>		<b>\$11,003,455</b>
		20.01	At-grade station, stop, shelter, mall, terminal, platform				\$7,410,000		\$2,223,000	\$9,633,000		\$11,003,455
		20.01.04	Streetcar Stop (1 Center or 2 Side)	EA	\$200,000	37.1	\$7,410,000	30%	\$2,223,000	\$9,633,000	2018	\$11,003,455
<b>30</b>			<b>SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>				<b>\$29,640,000</b>		<b>\$5,928,000</b>	<b>\$35,568,000</b>		<b>\$40,628,142</b>
		30.02	Light Maintenance Facility				\$29,640,000		\$5,928,000	\$35,568,000		\$40,628,142
		30.02.03	Streetcar MSF Allowance	RM	\$4,000,000	7.4	\$29,640,000	20%	\$5,928,000	\$35,568,000	2018	\$40,628,142
<b>40</b>			<b>SITWORK &amp; SPECIAL CONDITIONS</b>				<b>\$59,146,607</b>		<b>\$3,642,600</b>	<b>\$62,789,207</b>		<b>\$69,279,475</b>
		40.02	Site Utilities, Utility Relocation				\$12,142,000		\$3,642,600	\$15,784,600		\$18,030,223
		40.02.02	Streetcar Utility Relocation Allowance (Dense Urban)	RM	\$2,000,000	5.3	\$10,660,000	30%	\$3,198,000	\$13,858,000	2018	\$15,829,532
		40.02.04	On-Street Drainage Modification Allowance	RM	\$200,000	7.4	\$1,482,000	30%	\$444,600	\$1,926,600	2018	\$2,200,691
		40.06	Pedestrian / bike access and accommodation, landscaping				\$0		\$0	\$0		\$0
		40.06.01	Low Skyway (Less Than 16ft) Allowance	EA	\$50,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.07	Automobile, bus, van accessways including roads, parking lots				\$0		\$0	\$0		\$0
		40.07.01	Roadway Grade Adjustment For Low Clearance (14-16ft) Allowance	EA	\$500,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.07.02	Roadway Grade Adjustment For Low Clearance (Less Than 14ft) Allowance	EA	\$1,000,000	0.0	\$0	30%	\$0	\$0	2018	\$0
		40.08	Temporary Facilities and other indirect costs during construction				\$47,004,607		\$0	\$47,004,607		\$51,249,253
		40.08.01	Temporary Maintenance of Traffic	LS	5.0%	194490150.6	\$9,724,508	0%	\$0	\$9,724,508	2018	\$11,107,981
		40.08.02	Contractor Indirects (Staff, Office, etc.)	LS	10.0%	219294700.2	\$21,929,470	0%	\$0	\$21,929,470	2018	\$25,049,303
		40.08.03	Art in Transit (1% of Construction)	LS	1.0%	219294700.2	\$2,192,947	0%	\$0	\$2,192,947	2018	\$2,504,930
<b>50</b>			<b>SYSTEMS</b>				<b>\$37,043,500</b>		<b>\$8,074,950</b>	<b>\$45,118,450</b>		<b>\$51,537,302</b>
		50.02	Traffic signals and crossing protection				\$6,662,500		\$1,998,750	\$8,661,250		\$9,893,457
		50.02.01	Modify Existing Traffic Signals Allowance	RM	\$1,000,000	5.3	\$5,330,000	30%	\$1,599,000	\$6,929,000	2018	\$7,914,766
		50.02.02	Streetcar Signal Priority Allowance	RM	\$250,000	5.3	\$1,332,500	30%	\$399,750	\$1,732,250	2018	\$1,978,691
		50.03	Traction power supply: substations				\$8,892,000		\$1,778,400	\$10,670,400		\$12,188,442
		50.03.02	Streetcar TPSS Allowance	RM	\$1,200,000	7.4	\$8,892,000	20%	\$1,778,400	\$10,670,400	2018	\$12,188,442
		50.04	Traction power distribution: catenary and third rail				\$20,377,500		\$4,075,500	\$24,453,000		\$27,931,847
		50.04.02	Streetcar OCS Allowance	RM	\$2,750,000	7.4	\$20,377,500	20%	\$4,075,500	\$24,453,000	2018	\$27,931,847
		50.06	Fare collection system and equipment				\$1,111,500		\$222,300	\$1,333,800		\$1,523,555
		50.06.02	Streetcar Fare Collection (Assume Simple TVMs at Stops)	EA	\$75,000	14.8	\$1,111,500	20%	\$222,300	\$1,333,800	2018	\$1,523,555
		<b>Construction Subtotal (10-50)</b>				<b>0.0</b>	<b>\$204,680,107</b>		<b>\$34,306,550</b>	<b>\$238,986,657</b>		<b>\$270,543,953</b>




**SAINT PAUL  
STREETCAR FEASIBILITY STUDY**

<b>60</b>	<b>ROW, LAND, EXISTING IMPROVEMENTS</b>					<b>\$3,705,000</b>	<b>\$1,111,500</b>	<b>\$4,816,500</b>		<b>\$5,501,727</b>	
	60.01	Purchase or lease of real estate				\$3,705,000	\$1,111,500	\$4,816,500		\$5,501,727	
	60.01.01	Streetcar VMF & Misc. Right of Way Allowance	RM	\$500,000	7.4	\$3,705,000	30%	\$1,111,500	\$4,816,500	2018	\$5,501,727
<b>70</b>	<b>VEHICLES (number)</b>					<b>\$66,690,000</b>		<b>\$3,334,500</b>	<b>\$70,024,500</b>		<b>\$79,986,654</b>
	70.01	Light Rail				\$66,690,000		\$3,334,500	\$70,024,500		\$79,986,654
	70.01.02	Modern Streetcar Vehicle Allowance	EA	\$4,500,000	14.8	\$66,690,000	5%	\$3,334,500	\$70,024,500	2018	\$79,986,654
<b>80</b>	<b>PROFESSIONAL SERVICES (applies to Cats. 10-50)</b>					<b>\$81,163,186</b>		<b>\$0</b>	<b>\$81,163,186</b>		<b>\$92,710,003</b>
	80.01	Preliminary Engineering				\$8,116,319		\$0	\$8,116,319		\$9,271,000
	80.01.01	Percentage of Direct Costs SCC (10-50)	LS	3%	270543952.7	\$8,116,319	0%	\$0	\$8,116,319	2018	\$9,271,000
	80.02	Final Design				\$21,643,516		\$0	\$21,643,516		\$24,722,668
	80.02.01	Percentage of Direct Costs SCC (10-50)	LS	8%	270543952.7	\$21,643,516	0%	\$0	\$21,643,516	2018	\$24,722,668
	80.03	Project Management for Design and Construction				\$16,232,637		\$0	\$16,232,637		\$18,542,001
	80.03.01	Percentage of Direct Costs SCC (10-50)	LS	6%	270543952.7	\$16,232,637	0%	\$0	\$16,232,637	2018	\$18,542,001
	80.04	Construction Administration & Management				\$16,232,637		\$0	\$16,232,637		\$18,542,001
	80.04.01	Percentage of Direct Costs SCC (10-50)	LS	6%	270543952.7	\$16,232,637	0%	\$0	\$16,232,637	2018	\$18,542,001
	80.05	Professional Liability and other Non-Construction Insurance				\$2,705,440		\$0	\$2,705,440		\$3,090,333
	80.05.01	Percentage of Direct Costs SCC (10-50)	LS	1%	270543952.7	\$2,705,440	0%	\$0	\$2,705,440	2018	\$3,090,333
	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.				\$5,410,879		\$0	\$5,410,879		\$6,180,667
	80.06.01	Percentage of Direct Costs SCC (10-50)	LS	2%	270543952.7	\$5,410,879	0%	\$0	\$5,410,879	2018	\$6,180,667
	80.07	Surveys, Testing, Investigation, Inspection				\$5,410,879		\$0	\$5,410,879		\$6,180,667
	80.07.01	Percentage of Direct Costs SCC (10-50)	LS	2%	270543952.7	\$5,410,879	0%	\$0	\$5,410,879	2018	\$6,180,667
	80.08	Start up				\$5,410,879		\$0	\$5,410,879		\$6,180,667
	80.08.01	Percentage of Direct Costs SCC (10-50)	LS	2%	270543952.7	\$5,410,879	0%	\$0	\$5,410,879	2018	\$6,180,667
	<b>Subtotal (10-80)</b>					<b>\$356,238,292</b>		<b>\$38,752,550</b>	<b>\$394,990,842</b>		<b>\$448,742,337</b>
<b>90</b>	<b>UNALLOCATED CONTINGENCY</b>		LS	10%					<b>\$39,499,084</b>		<b>\$44,874,234</b>
<b>100</b>	<b>FINANCE CHARGES</b>								<i>Current Year Total</i>		<i>YoE Total</i>
	<b>Segment Totals (10-100)</b>								<b>\$434,489,927</b>		<b>\$493,616,571</b>