



RIVERVIEW CORRIDOR

Project Report: Capital Cost Methodology

DRAFT - PAC Review
February 2016

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1.0 INTRODUCTION

Capital costs are a one-time expenditure required to build a system, including infrastructure costs and soft costs. This memorandum presents the methodology for developing order-of-magnitude capital cost estimates for the Detailed Alternatives defined for the Riverview Corridor Pre-Project Development Study ('the Study').

Following the Initial Screening of Alternatives, the Study will examine a relatively small set of options characterized by factors such as alignment, transit mode, transit operating characteristics, and stop/station locations:

- Alignment options
 - Trunk of the Riverview Corridor – W. 7th Street, the Canadian Pacific Railway tracks between the Union Depot and the Ford Site
 - Sub-areas – Downtown Saint Paul, the Ford Site, Mississippi River Crossing, and Airport/South Loop in Bloomington.
- Transit mode
 - Bus – Local Bus, Arterial Bus Rapid Transit, Dedicated BRT
 - Rail – Modern Streetcar, Light Rail Transit (LRT), Diesel Multiple Unit (DMU)
- Transit operating characteristics
 - Mixed traffic – In street, existing freight railroad
 - Dedicated – At-grade, aerial structure, tunnel
 - 'Hybrid' – Combination of mixed traffic and dedicated

The Study Team, comprised of the Ramsey County Regional Railroad Authority (RCRRA) and its Study Consultants, anticipates refining capital cost estimates as a result of ensuing project development activities, such as detailed basemapping, design and engineering.

Further, this methodology is consistent with the Rush Line Corridor Pre-Project Development Study, also undertaken by the Ramsey County Regional Railroad Authority.

2.0 CAPITAL COST METHODOLOGY

Capital cost estimates will be prepared using the format the Federal Transit Administration's (FTA) standard cost categories (SCC). **Table 2 -1** summarizes the SCC definitions, including groupings for organization of the data. The level of detail of the capital cost estimates for the Riverview Corridor PPD Study is conceptual and preliminary in nature, as is typical with planning studies that evaluate numerous alternatives.

Table 2-1: FTA SCC Capital Cost Estimate Organization¹

STANDARD COST CATEGORY (SCC)	DESCRIPTION
SCC 10-Guideway and Track Elements	Guideway grading and drainage; retaining walls, bridges and tunnels; trackwork; busway construction
SCC 20-Stations, Stops, Terminal, Intermodal	Construction of station/stop platforms, enclosures, canopies, and fixtures; elevators; escalators and stairs
SCC 30-Support Facilities: Yards, Shops, Administration Buildings	Operations, maintenance, and storage facilities
SCC 40-Sitework and Special Conditions	Demolition, clearing, and excavation; utilities and utility relocation; hazardous soil and water remediation; environmental mitigation; reconstruction of roadways, intersection and non-guideway structures; pedestrian and bicycle accommodations, sidewalks and trails; landscaping, fencing and lighting, park-and-ride facilities
SCC 50-Systems	Train control signals; roadway grade crossing protection; traction power substations; overhead catenary system; communication systems; central control hardware and software; automated fare collection system; roadway traffic signals
SCC 60-Right-of-Way, Land, Existing Improvements	Acquisition of right-of-way or easements for guideway, stations, and other facilities; relocation of existing households and businesses
SCC 70-Vehicles	Rail vehicles such as light rail, modern streetcar, diesel multiple unit (DMU); standard buses including 40' and articulated (60'); high-quality BRT vehicles including 40' and articulated (60') (see Table 3-2), non-revenue vehicles and spare parts.
SCC 80-Professional Services	Preliminary engineering; final design; project management for design and construction; construction administration and management; insurance; legal, permits review fees; surveys, testing, investigation, inspection; agency force account work
SCC 90-Contingency	Overall project contingency and reserves
SCC 100-Finance Charges	Estimated expenses for local financing of project activities prior to federal funding commitment (For the Riverview Corridor PPD Study, this item would be left blank)

¹ Reference: http://www.fta.dot.gov/12305_15612.html

3.0 ASSUMPTIONS

The capital cost estimates will be based upon a number of assumptions derived from various sources. These assumptions include capital cost parameters applied at certain steps during the process, unit prices for the various capital cost line items, and quantity, location, and conceptual definitions for each of the alternatives. **Table 3-1** lists bus and BRT vehicle assumptions.

Table 3-1: Draft Bus and BRT Vehicle Assumptions²

BUSES	VEHICLE ASSUMPTIONS
<i>Local Bus³</i>	<i>Standard Bus, 40' or 60'</i>
<i>Arterial BRT</i>	<i>Standard Bus, 40' or 60'</i>
<i>Hybrid Bus Dedicated Guideway BRT</i>	<i>High-quality BRT, 40' or 60'</i>

3.1 Parameters

Capital cost parameters are necessary assumptions that are not related to the specific location or design features of the corridor or the alternatives under consideration.

3.1.1 Base Year

Year 2016 will be used as the base year for definition of the unit prices and development of the capital cost estimates. The Study uses a 3 percent annual inflation rate to escalate base year unit costs (e.g. 2014) to Year 2016 dollars.⁴

3.1.2 Contingencies

Contingencies are intended to compensate for unforeseen items of work, quantity fluctuations, and variances in unit costs that develop as the project progresses through the various stages of design development.

3.1.3 Annualization Factors

Assuming that cost-effectiveness would be a detailed evaluation criterion, annualization factors are necessary to convert base year capital cost estimates into annualized capital costs. The Riverview Corridor PPD Study uses FTA's annualization factors for these calculations.

3.1.4 Hybrid Bus and Hybrid Rail

Similar to developing conceptual operating and maintenance cost estimates, the Study Team will develop order-of-magnitude capital cost estimates for the Hybrid Bus and Hybrid Rail detailed alternatives as follows:

² The Study will identify a preliminary conceptual transit fleet composition for each detailed alternative for purposes of estimating capital cost. The RCRRA anticipates continuing to refine these concepts and estimates during environmental review and design/engineering.

³ This encompasses the No-Build alternative (Route 54) and background bus service associated with any of the Detailed Alternatives for the Riverview Corridor.

⁴ Reference: *Financial Management Plan for Southwest Light Rail*, Revision 02-00, August 2015, prepared by the Metropolitan Council, Metro Transit Finance, p 4.

- Hybrid Bus – Using a combination of Arterial BRT and Dedicated BRT infrastructure and fleet components, e.g. station facilities, transit signal priority, ticket vending machines, and shared or dedicated guideway. The Study will estimate capital costs based on quantities and unit costs of distinct elements or segments.
- Hybrid Rail – Using a combination of Modern Streetcar, LRT, and or DMU, e.g. station facilities; embedded or ballasted or direct fixation tracks; rail yard and shop; and traction power substations. The Study will estimate capital costs based on quantities and unit costs of distinct elements or segments.

3.2 Unit Prices

Unit prices for the various capital cost elements will be based on local and national references that include, but are not limited to:

- Southwest LRT/METRO Green Line Extension Project
- Gateway Corridor/METRO Gold Line Project Draft Environmental Impact Statement (BRT on dedicated guideway)
- 'A' Line/Snelling Avenue Arterial BRT
- Cotton Belt Preliminary Engineering and Environment Assessment (Dallas, TX)
- Nicollet-Central Streetcar Project (Minneapolis, MN)

The Study Team will review unit price assumptions from these sources to determine their applicability to the detailed alternatives under consideration for the Riverview Corridor PPD Study. Appendix A presents draft unit costs by detailed alternative, including the No-Build.

Appendix A:

Preliminary Draft Unit Costs for:

Bus: No-Build, Arterial BRT, Dedicated BRT, Hybrid Bus

Rail: Modern Streetcar, LRT, Diesel Multiple Unit, and Hybrid Rail

Riverview Corridor Pre-Project Development Study				
Bus, Arterial BRT, Dedicated BRT, and Hybrid Bus				
Draft Estimated Unit Costs				
Number	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
10.00	GUIDEWAY & TRACK ELEMENTS (Route Feet)			
10.01	Guideway: At-Grade Exclusive Right-of-Way	LF	\$ 121	15%
10.02	Guideway: At-Grade semi-exclusive (allows cross traffic)	RF	\$ -	15%
10.03	Guideway: At-Grade in Mixed Traffic	RF	\$ -	15%
10.04	Guideway: Aerial Structure	RF	\$ -	25%
10.05	Guideway: Built-up Fill	RF	\$ -	20%
10.06	Guideway: Underground Cut & Cover	RF	\$ -	30%
10.07	Guideway: Underground Tunnel	RF	\$ -	30%
10.08	Guideway: Retained Cut or Fill	RF	\$ -	20%
10.08a	Guideway: Retained cut or fill - Freight			
20.00	STATIONS, STOPS, TERMINALS, INTERMODAL (Number)			
20.01	At-grade station, stop, shelter, mall, terminal, platform	EA	\$ 2,157,000	15%
20.02	Aerial station, stop, shelter, mall, terminal, platform	EA	\$ -	20%
20.03	Underground station, stop, shelter, mall, terminal platform	EA	\$ -	30%
20.04	Other Stations, landings, terminals, intermodal, ferry, trolley, etc.	EA	\$ -	25%
20.05	Joint development	EA	\$ -	25%
20.06	Automobile parking multi-story structure	SP	\$ 20,000	10%
20.06a	Automobile parking - unstructured	SP	\$ 6,000	10%
20.07	Elevators	EA	\$ 844,000	10%
20.07	Escalators - 2 escalators and 2 elevators per aerial/underground station)	EA	\$ 4,000,000	10%
30.00	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS			
30.01	Administration Building, Office, sales, storage, revenue counting	SF	\$ -	15%
30.02	Light Maintenance Facility Allowance	VEH	\$ 400,000	20%
30.03	Heavy Maintenance Facility	EA	\$ -	20%
30.04	Storage or Maintenance of Way Building	EA	\$ -	20%
30.05	Yard and Yard Track	EA	\$ -	15%
40.00	SITWORK & SPECIAL CONDITIONS			
40.01	Demolition, Clearing, Earthwork	RF	\$ 400	20%
40.02	Site Utilities, Utility Relocation (Urban)	RF	\$ 1,000	30%
40.02	Site Utilities, Utility Relocation (Suburban)	RF	\$ 800	30%
40.02	Site Utilities, Utility Relocation (Rural)	RF	\$ 600	30%
40.03	Haz. Mat'l, contam'd soil removal/mitigation, ground water treatments	RF	\$ 50	20%
40.04	Environmental mitigation, e.g. wetlands, historical/archeologic parks	RF	\$ 100	20%
40.05	Site structures including retaining walls, sound walls	RF	\$ 100	20%
40.06	Pedestrian/bike access and accommodation, landscaping	RF	\$ 350	20%
40.07	Automobile, bus, van accessways including roads, parking lots	RF	\$ 1,050	20%
40.08	Temporary facilities and other indirect costs during construction	RF	\$ 1,150	20%
50.00	SYSTEMS			
50.01	Train control and signals	RF	N/A	15%
50.02	Traffic signals	EA	\$ 250,000	15%
50.02a	Traffic signals and crossing protection - Freight	RF	N/A	15%
50.03	Traction power supply: substations	RF	N/A	15%
50.04	Traction power distribution: catenary	RF	N/A	15%
50.05	Communications	RF	\$ 150	15%
50.06	Fare collection system and equipment	STA	\$ 338,000	10%
50.07	Central control allowance	LS	\$ 580,000	20%
60.00	ROW, LAND, EXISTING IMPROVEMENTS			
60.01	Purchase or lease of real estate	RF	\$ 150	30%
60.02	Relocation of existing households and businesses	RF	\$ 300	40%
	Professional Services (2% of SCC 60 direct costs)	2%	N/A	100%
70.00	VEHICLES (number)			
70.04	Bus - 40' hybrid electric	EA	\$ 700,000	5%
70.04	Bus - 60'/articulated hybrid electric	EA	\$ 1,200,000	5%
70.05	Other	EA	N/A	10%
70.06	Non revenue vehicles	EA	N/A	15%
70.07	Spare Parts	LS	N/A	0%

Riverview Corridor Pre-Project Development Study				
Bus, Arterial BRT, Dedicated BRT, and Hybrid Bus				
Draft Estimated Unit Costs				
Number	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
80.00	PROFESSIONAL SERVICES (SCC CATEGORIES 10 - 50)	30.00%		
80.01	Project Planning	3.00%		20%
80.02	Engineering	9.00%		20%
80.03	Project Management for Design and Construction	7.00%		20%
80.04	Construction Administration & Management	6.00%		20%
80.05	Professional Liability and other non Construction Insurance	2.00%		20%
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.	1.50%		20%
80.07	Surveys, Testing, Investigation, Inspection	0.50%		20%
80.08	Start-up (by Transit workforce)	1.00%		20%
SUBTOTAL SCC CATEGORIES 10-80				
90.00	Contingency (Unallocated)	5.00%		
100.00	Finance Charges	3.00%	per year	
TOTAL PROJECT COST (10-100)				
LF = Linear Foot; RF = Route Foot; EA = Each; SF = Square Foot; STA = Cost per Station; LS = Lump Sum; TF = Track Foot SP = Parking Space				
Cost Estimating Assumptions:				
Estimates are prepared using current dollars (2016).				
Adequate experienced craft labor is available.				
Normal productivity rates as historically experienced are utilized.				
Compatible trade agreements exist in the region.				
No strike impacts will be experienced by the project.				
There are sufficient experienced contractors available to perform said work.				
Normal Minneapolis/Saint Paul Area weather impacts to constructions schedule.				
Existing state of the art construction technology will be utilized.				
Assumes cooperation between stakeholders.				



Riverview Corridor Pre-Project Development Study				
LRT (Dedicated Guideway)				
Draft Estimated Unit Costs				
Number	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
10.00	GUIDEWAY & TRACK ELEMENTS (Route Feet)			
10.01	Guideway: At-Grade Exclusive Right of Way	RF	\$ 300	15%
10.02	Guideway: At-Grade semi-exclusive (allows cross traffic)	RF	\$ 1,330	15%
10.04	Guideway: Aerial Structure	RF	\$ 12,250	25%
10.08	Guideway: Retained Cut or Fill	RF	\$ 12,900	20%
10.09	Track: Direct Fixation	TF	\$ 600	10%
10.10	Track: Embedded	TF	\$ 800	15%
10.11	Track: Ballasted	TF	\$ 500	10%
10.12	Track: Special (switches, turnouts)	EA	\$ 1,000,000	10%
20.00	STATIONS, STOPS, TERMINALS, INTERMODAL (Number)			
20.01	At-grade station, stop, shelter, mall, terminal, platform	EA	\$ 3,000,000	15%
20.02	Aerial station, stop, shelter, mall, terminal, platform	EA	\$ 9,358,000	20%
20.03	Underground station, stop, shelter, mall, terminal platform	EA	N/A	30%
20.04	Other Stations, landings, terminals, intermodal, ferry, trolley, etc.	EA	N/A	25%
20.05	Joint development	EA	N/A	25%
20.06	Automobile parking multi-story structure	SP	\$ 20,000	10%
20.06a	Automobile parking - unstructured	SP	\$ 6,000	10%
20.07	Elevators	EA	\$ 844,000	10%
20.07	Escalators - 2 escalators and 2 elevators per aerial/underground station)	EA	\$ 4,000,000	10%
30.00	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS			
30.01	Administration Building, Office, sales, storage, revenue counting	SF	\$ 350	15%
30.02	Light Maintenance Facility - Allowance	LS	\$ 24,000,000	20%
30.03	Heavy Maintenance Facility - Allowance	EA	N/A	20%
30.04	Storage or Maintenance of Way Building	EA	N/A	20%
30.05	Yard and Yard Track	EA	\$ 30,000	15%
40.00	SITWORK & SPECIAL CONDITIONS			
40.01	Demolition, Clearing, Earthwork	RF	\$ 400	20%
40.02	Site Utilities allowance - High	RF	\$ 1,000	30%
40.02	Site Utilities allowance - Medium	RF	\$ 800	30%
40.02	Site Utilities allowance - Low	RF	\$ 600	30%
40.03	Haz. Mat'l, contam'd soil removal/mitigation, ground water treatments	RF	\$ 50	20%
40.04	Environmental mitigation, e.g. wetlands, historical/archeologic parks	RF	\$ 100	20%
40.05	Site structures including retaining walls, sound walls	RF	\$ 100	20%
40.06	Pedestrian/bike access and accommodation, landscaping	RF	\$ 350	20%
40.07	Automobile, bus, van accessways including roads, parking lots	RF	\$ 1,050	20%
40.08	Temporary facilities and other indirect costs during construction	RF	\$ 1,150	20%
50.00	SYSTEMS			
50.01	Train control and signals	RF	\$ 450	15%
50.02	Traffic signals and crossing protection	EA	\$ 250,000	15%
50.03	Traction power supply: substations	RF	\$ 500	15%
50.04	Traction power distribution: catenary and third rail	RF	\$ 460	15%
50.05	Communications	RF	\$ 300	15%
50.06	Fare collection system and equipment	STA	\$ 338,000	10%
50.07	Central control	LS	\$ 750,000	20%
60.00	ROW, LAND, EXISTING IMPROVEMENTS			
60.01	Purchase or lease of real estate	RF	\$ 150	30%
60.02	Relocation of existing households and businesses	RF	\$ 300	40%
70.00	VEHICLES (number)			
70.01	Light Rail	EA	\$ 3,800,000	5%
70.04	Bus	EA	N/A	5%
70.05	Other	EA	N/A	10%
70.06	Non revenue vehicles	EA	N/A	15%
70.07	Spare Parts	LS	5% of vehicles	0%



Riverview Corridor Pre-Project Development Study				
LRT (Dedicated Guideway)				
Draft Estimated Unit Costs				
Number	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
80.00	PROFESSIONAL SERVICES (SCC CATEGORIES 10 - 50)	34.00%		
80.01	Project Planning	3.00%		20%
80.02	Engineering	9.00%		20%
80.03	Project Management for Design and Construction	7.00%		20%
80.04	Construction Administration & Management	10.00%		20%
80.05	Professional Liability and other non Construction Insurance	2.00%		20%
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.	1.50%		20%
80.07	Surveys, Testing, Investigation, Inspection	0.50%		20%
80.08	Start-up (by Transit workforce)	1.00%		20%
SUBTOTAL SCC CATEGORIES 10-80				
90.00	Contingency (Unallocated)	5.00%		
100.00	Finance Charges	3.00%	per year	
TOTAL PROJECT COST (10-100)				
LF = Linear Foot; RF = Route Foot; EA = Each; SF = Square Foot; STA = Cost per Station; LS = Lump Sum; TF = Track Foot SP = Parking Space				
Cost Estimating Assumptions:				
Estimates are prepared using current dollars (2016).				
Adequate experienced craft labor is available.				
Normal productivity rates as historically experienced are utilized.				
Compatible trade agreements exist in the region.				
No strike impacts will be experienced by the project.				
There are sufficient experienced contractors available to perform said work.				
Normal Minneapolis/Saint Paul Area weather impacts to constructions schedule.				
Existing state of the art construction technology will be utilized.				
Assumes cooperation between stakeholders.				



Riverview Corridor Pre-Project Development Study				
DMU				
Draft Estimated Unit Costs				
Number	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
10.00	GUIDEWAY & TRACK ELEMENTS (Route Feet)			
10.01	Guideway: At-Grade Exclusive Right of Way	RF	\$ 300	15%
10.02	Guideway: At-Grade semi-exclusive (allows cross traffic)	RF	\$ 2,650	15%
10.03	Guideway: At-Grade in Mixed Traffic	RF	N/A	15%
10.04	Guideway: Aerial Structure	RF	\$ 12,250	25%
10.05	Guideway: Built-up Fill	RF	\$ 5,550	20%
10.06	Guideway: Underground Cut & Cover	RF	\$ 18,150	30%
10.07	Guideway: Underground Tunnel	RF	\$ 42,000	30%
10.08	Guideway: Retained Cut or Fill	RF	\$ 12,900	20%
10.09	Track: Direct Fixation	RF	\$ 1,200	10%
10.10	Track: Embedded	RF	\$ 1,450	15%
10.11	Track: Ballasted	RF	\$ 1,000	10%
10.12	Track: Special (switches, turnouts)	EA	\$ 1,000,000	10%
10.13	Track: Vibration and noise dampening	LS	N/A	15%
20.00	STATIONS, STOPS, TERMINALS, INTERMODAL (Number)			
20.01	At-grade station, stop, shelter, mall, terminal, platform	EA	\$ 2,151,000	15%
20.02	Aerial station, stop, shelter, mall, terminal, platform	EA	\$ 9,358,000	20%
20.03	Underground station, stop, shelter, mall, terminal platform	EA	\$ 68,762,000	30%
20.04	Other Stations, landings, terminals, intermodal, ferry, trolley, etc.	EA	N/A	25%
20.05	Joint development	EA	N/A	25%
20.06	Automobile parking multi-story structure	SP	\$ 20,000	10%
20.06a	Automobile parking - unstructured	SP	\$ 6,000	10%
20.07	Elevators	EA	\$ 844,000	10%
20.07	Escalators - (2 escalators and 2 elevators per aerial/underground station)	EA	\$ 4,000,000	10%
30.00	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS			
30.01	Administration Building, Office, sales, storage, revenue counting	SF	\$ 350	15%
30.02	Light Maintenance Facility*	LS	\$ 21,123,000	20%
30.03	Heavy Maintenance Facility*	LS	\$ 42,215,000	20%
30.04	Storage or Maintenance of Way Building	EA	N/A	20%
30.05	Yard and Yard Track*	LS	\$ 26,977,000	15%
40.00	SITWORK & SPECIAL CONDITIONS			
40.01	Demolition, Clearing, Earthwork	RF	\$ 400	20%
40.02	Site Utilities, Utility Relocation (Urban)	RF	\$ 1,000	30%
40.02	Site Utilities, Utility Relocation (Suburban)	RF	\$ 800	30%
40.02	Site Utilities, Utility Relocation (Rural)	RF	\$ 600	30%
40.03	Haz. Mat'l, contam'd soil removal/mitigation, ground water treatments	RF	\$ 50	20%
40.04	Environmental mitigation, e.g. wetlands, historical/archeologic parks	RF	\$ 100	20%
40.05	Site structures including retaining walls, sound walls	RF	\$ 100	20%
40.06	Pedestrian/bike access and accommodation, landscaping	RF	\$ 350	20%
40.07	Automobile, bus, van accessways including roads, parking lots	RF	\$ 1,050	20%
40.08	Temporary facilities and other indirect costs during construction	RF	\$ 1,150	20%
50.00	SYSTEMS			
50.01	Train Control and signals	RF	\$ 450	15%
50.02	Traffic signals and crossing protection	EA	\$ 250,000	15%
50.03	Traction power supply: substations	RF	N/A	15%
50.04	Traction power distribution: catenary	RF	N/A	15%
50.05	Communications	RF	\$ 150	15%
50.06	Fare collection system and equipment	STA	\$ 338,000	10%
50.07	Central Control	LS	\$ 702,000	20%
60.00	ROW, LAND, EXISTING IMPROVEMENTS			
60.01	Purchase or lease of real estate	RF	\$ 150	30%
60.02	Relocation of existing households and businesses	RF	\$ 300	40%



Riverview Corridor Pre-Project Development Study				
DMU				
Draft Estimated Unit Costs				
Number	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
70.00	VEHICLES (number)			
70.03	DMU	EA	\$ 7,341,000	5%
70.04	Bus	EA	N/A	5%
70.05	Other	EA	N/A	10%
70.06	Non revenue vehicles	EA	N/A	15%
70.07	Spare Parts (Based on vehicle total)	LS	5%	0%
80.00	PROFESSIONAL SERVICES (SCC CATEGORIES 10 - 50)	34.00%		
80.01	Project Planning	3.00%		20%
80.02	Engineering	9.00%		20%
80.03	Project Management for Design and Construction	7.00%		20%
80.04	Construction Administration & Management	10.00%		20%
80.05	Professional Liability and other non Construction Insurance	2.00%		20%
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.	1.50%		20%
80.07	Surveys, Testing, Investigation, Inspection	0.50%		20%
80.08	Start-up (by Transit workforce)	1.00%		20%
SUBTOTAL SCC CATEGORIES 10-80				
90.00	Contingency (Unallocated)	5.00%		
100.00	Finance Charges	3.00%	per year	
TOTAL PROJECT COST (10-100)				
LF = Linear Foot; RF = Route Foot; EA = Each; SF = Square Foot; STA = Cost per Station; LS = Lump Sum; TF = Track Foot				
SP = Parking Space				
*Light maintenance facility includes inspection pits, servicing equipment, and train washing.				
*Heavy maintenance facility includes inspection pits, servicing equipment, train washing, sanding tower piping, wheel truing, and drop table.				
*Light and heavy maintenance yards are assumed to be equal.				
Cost Estimating Assumptions:				
Estimates are prepared using current dollars (2016).				
Adequate experienced craft labor is available.				
Normal productivity rates as historically experienced are utilized.				
Compatible trade agreements exist in the region.				
No strike impacts will be experienced by the project.				
There are sufficient experienced contractors available to perform said work.				
Normal Minneapolis/St. Paul Area weather impacts to constructions schedule.				
Existing state of the art construction technology will be utilized.				
Assumes cooperation between stakeholders.				



Riverview Corridor Pre-Project Development Study				
Modern Streetcar and Hybrid Rail				
Draft Estimated Unit Costs				
Reference: Nicollet-Central Streetcar Project, North Rampart/St Claude Streetcar Project (New Orleans)				
Base Year: 2015 dollars. Year 2016 dollars uses 3 percent escalation rate.				
SCC	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
10	Guideway and Track Element			
	10.09 Direct Fixation Track	TF	\$ 618	10%
	10.10 Embedded Track in Roadway	TF	\$ 824	15%
	10.12 Special Trackwork - Embedded crossing (Trail)	EA	\$ 267,800	15%
	10.12 Special Trackwork - Embedded turnout (Trail)	EA	\$ 1,030,000	15%
20	Stations, Stops, Terminals, Intermodal			
	20.01 Modern Streetcar Stop - Center Loading	EA	\$ 154,500	15%
	20.01 Modern Streetcar Stop - Side Loading	EA	\$ 113,300	15%
30	Support Facilities: Yards, Shops, Admin. Bldgs			
	30.03 Heavy maintenance facility - Streetcar	LS	\$ 24,720,000	20%
	30.05 Yard and yard track - Streetcar MOS	LS	\$ 20,600,000	15%
40	Sitework and Special Conditions			
	40.02 Utility allowance	TF	\$ 412	30%
	40.02 Track drainage allowance	TF	\$ 103	30%
	40.02 Street lighting modification allowance	TF	\$ 26	30%
	40.03 Haz mat cleanup allowance	LS	\$ 1,030,000	20%
	40.05 Bridge allowance for streetcar	TF	\$ 10,300	25%
	40.06 Urban improvement & landscaping allowance	TF	\$ 26	20%
	40.06 ADA upgrade allowance per intersection	EA	\$ 30,900	20%
	40.07 Roadway construction allowance	TF	\$ 155	20%
	40.08 MOT during construction (% of direct costs)	5%		
	40.08 Construction - Contractor indirects (mobilization, etc; % of direct costs)	15%		
50	Systems			
	50.01 Train control and signals or Interlocking	EA	\$ 515,000	15%
	50.01 Powered switch machine and train circuits	EA	\$ 206,000	15%
	50.01 Train warnings at driveways	EA	\$ 51,500	15%
	50.02 Traffic signal - New	EA	\$ 231,750	15%
	50.02 Traffic Signal - Modify existing	EA	\$ 103,000	15%
	50.02 TSP upgrade	TF	\$ 21	15%
	50.02 Streetcar only signal phase (TWC)	EA	\$ 25,750	15%
	50.03 Traction power substation	EA	\$ 566,500	15%
	50.03 Traction power substation	EA	\$ 2,060,000	15%
	50.04 Traction power distribution allowance	TF	\$ 185	15%
	50.04 Traction power distribution allowance	TF	\$ 258	15%
	50.04 Traction power distribution allowance (OCS -ready)	TF	\$ 165	15%
	50.04 Traction power distribution allowance (OCS -ready)	TF	\$ 247	15%
	50.05 Fibre optic trunk allowance	RF	\$ 41	15%
	50.05 Fibre optic trunk allowance	RF	\$ 93	15%
	50.06 Fare collection system and equipment	EA	\$ 18,540	10%
	50.06 Fare collection system and equipment	EA	\$ 348,140	10%
	50.07 Central control allowance	TF	\$ 10	20%
	50.07 Central control allowance	LS	\$ 618,000	20%
60	Right-of-Way Allowance			
	60.01 Streetcar Operations and Maintenance Facility	LS	\$ 1,030,000	30%
	60.01 Streetcar TPSS Easement	EA	\$ 103,000	30%
	60.01 Streetcar TPSS Easement	RF	\$ 155	30%



Riverview Corridor Pre-Project Development Study
Modern Streetcar and Hybrid Rail
Draft Estimated Unit Costs

Reference: Nicollet-Central Streetcar Project, North Rampart/St Claude Streetcar Project (New Orleans)
 Base Year: 2015 dollars. Year 2016 dollars uses 3 percent escalation rate.

SCC	Description	Unit	Unit Cost (2016 \$)	Recommended Allocated Contingency
70	Transit Vehicles			
	70.01 Modern streetcar (standard)	EA	\$ 4,326,000	5%
80	Professional Services (for SCCs 10 through 50)		32%	20%
	80.01 PE		3%	20%
	80.02 Final Design		9%	20%
	80.03 Project management for design and construction		7%	20%
	80.04 Construction administration and management		9%	20%
	80.05 Insurance		2%	20%
	80.06 Legal - Permits, review fees by other agencies/cities, etc.		2%	20%
	80.07 Survey, testing, investigation, inspection		1%	20%
	80.08 Start-up cost and agency force account work		1%	20%
90	Contingency			
	Construction (SCCs 10-50)		allocated by each + 5% overall	
	ROW		allocated by each + 5% overall	
	Vehicles		5%	
100	Finance Charges	3%	per year	
TOTAL PROJECT COST (10 - 100)				

LF= Linear foot; RF= Route foot; EA= Each; SF= Square Foot; STA= Cost per station; LS = Lump sum; TF = Track foot
 *Unit costs are presented as a range (low-high). "Low" costs represent smaller streetcar system (e.g. Nicollet-Central, Portland).
 ***"High" range represent larger systems, more similar to LRT.

Cost Estimating Assumptions:
 Estimates are prepared using current dollars (2016).
 Adequate experienced craft labor is available.
 Normal productivity rates as historically experienced are utilized.
 Compatible trade agreements exist in the region.
 No strike impacts will be experienced by the project.
 There are sufficient experienced contractors available to perform said work.
 Normal Minneapolis/Saint Paul Area weather impacts to constructions schedule.
 Existing state of the art construction technology will be utilized.
 Assumes cooperation between stakeholders.

