



# West Broadway Transit Study

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## Capital Cost Estimation Methodology

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Prepared by the  
SRF Consulting Group Team  
for





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## Introduction

The purpose of the Capital Cost Estimation Methodology Report is to define and document the methods used to evaluate the capital costs associated with the West Broadway Transit Study. As outlined in the Federal Transit Administration's (FTA) *Framework for Alternatives Analysis*, October 2005, this report is a working document that sets forth guidelines for the evaluation of alternatives throughout the AA study. It will initially serve as a consensus-building tool on technical methodologies and assumptions and ultimately be used in subsequent studies as a record of those applied methodologies and assumptions.

The methodology report includes the methodology and assumptions that will be used to develop the capital costs for the West Broadway Transit Study.

## 1. Capital Costs

Capital cost estimates will be developed to include the one-time expenditure required to build the system and typically include costs associated with the guideway, track, stations, structures, signalization and communications systems, support facilities, vehicles, and right-of-way acquisition. "Soft costs" for items such as engineering, construction services, project management, surveys, testing, insurance, legal, permits and owner's costs are also included as part of the overall capital cost. Contingencies, allocated and unallocated, are applied to the capital cost to account for uncertainty in both the estimating process and the scope of the project.

At this early study stage, there will not be sufficient definition or detail to prepare true construction cost estimates for the various alternatives under consideration. Rather, the capital cost estimates will be developed using representative typical unit costs or allowances on a per unit basis that is consistent with the level of alternatives definition. Capital cost estimates will need to be refined if additional studies are conducted to further the design of the corridor.

This portion of the report provides the key components needed to develop cost estimates for this level of transit study. These components include capital cost estimate organization methodology, assumptions, basis of unit prices, and the basis for cost estimation by alternative.

## 2. Methodology

Capital cost estimates will be prepared using the format and procedures currently required for project evaluation by the Federal Transit Administration (FTA). The FTA methodology includes the use of standard cost categories (SCC) and groupings for organization of the data, and detailed spreadsheets for development of annualized capital costs.

The FTA SCC organization for capital cost estimates was developed for application to many different types of transit improvements, and on project phases ranging from alternatives analysis to final design and construction. The capital cost elements for the West Broadway Transit Study are organized into the FTA SCC format as indicated in Table 1.



Table 1 - FTA SCC Capital Cost Estimate Organization

SCC Description	Description
SCC 10	<u>Guideway</u> Guideway grading and drainage; retaining walls, bridges and tunnels; trackwork; busway construction
SCC 20	<u>Stations</u> Construction of station platforms, enclosures, canopies and fixtures; elevators, escalators and stairs
SCC 30	<u>Support Facilities</u> Operations, maintenance, and storage facilities
SCC 40	<u>Sitework and Special Conditions</u> Demolition, clearing, and excavation; utilities and utility relocation; hazardous soil and water remediation; environmental mitigation; reconstruction of roadways, intersections and non-guideway structures; pedestrian and bicycle accommodations, sidewalks and trails; landscaping, fencing and lighting, park and ride facilities
SCC 50	<u>Systems</u> Train control signals; roadway grade crossing protection; traction power substations; overhead catenary system; communication systems; central control hardware and software; automated fare collection systems; roadway traffic signals
SCC 60	<u>Right of way</u> Acquisition of right of way or easements for guideway, stations, and other facilities; relocation of existing households and businesses
SCC 70	<u>Vehicles</u> Streetcar vehicles, bus rapid transit (BRT) or standard buses, and non-revenue vehicles, spare parts
SCC 80	<u>Professional Services</u> 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	<u>Unallocated Contingency</u> Overall project contingency and reserves
SCC 100	<u>Finance Changes</u> Estimated expenses for local financing of project activities prior to Federal funding commitment



The level of detail of the capital cost estimates for this study corresponds with the current level of the West Broadway Transit Study definition, engineering, and environmental analyses. The level of estimating detail typically increases as the project progresses through the various phases of development during the AA study, Environmental Impact studies, Preliminary Engineering, and eventually into Final Design.

As the level of design detail increases, more and more items are specifically estimated, leading to lower contingency costs in the estimate. Ideally, such project design and cost estimating maturation will not materially change the overall total capital cost estimate, but will make the estimate far more specific in nature.

The West Broadway Transit Study capital cost estimates will be developed using a segmented and tiered approach. Developing construction and right-of-way costs, SCC 10-60, will include dividing the BRT corridor into two segments and calculating construction and right-of-way costs for each segment separately, some of which may be common to multiple alternatives. Line items for each of these estimates would be categorized into individual SCC's and summarized for each alternative.

The methodology differs for corridor-wide capital cost elements such as vehicles and support facilities, and for "soft costs" such as professional services and unallocated contingencies. Cost estimates for those elements are identified and added after the individual segment estimates are combined for each full corridor alternative.

### 3. Assumptions

The capital cost estimates will be based upon a number of important 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 specific quantity, location, and design information taken from each of the alternatives.

#### 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. The West Broadway Transit Study capital cost estimates are based upon the following parameters:

- Base Year – Year 2015
- Allocated Contingencies – Allocated contingencies are contingencies that are associated with individual cost estimate categories. These 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. The level of allocated contingency applied to each cost category reflects the relative potential variability of those estimates. The following allocated contingencies will be used for the capital cost estimates:
  - SCC 10 - SCC 50: Infrastructure – 20%
  - SCC 60: Right-of-Way – 100%



- SCC 70: Vehicles – 5%
- SCC 80: Professional Services – 0%
- Unallocated Contingency – An unallocated contingency of 25 percent is included in the capital cost estimates. This contingency is applied to the total estimated capital cost for each alternative, and is added to any specific estimating contingencies that are included or allocated to the various cost categories.
- Escalation Factor – An annual escalation factor of 3 percent is used to inflate capital cost estimates from the base year to the forecast year.

## Unit Prices

Unit prices (base year) for the various capital cost elements are developed using several references and resources. Primary sources for unit price assumptions include:

- Milwaukee Streetcar Preliminary Engineering, 2011
- Arterial Transitway Corridors Study (Arterial BRT), 2011
- Bottineau Corridor Draft EIS (LRT and BRT), 2012
- Gateway Alternatives Analysis (Highway BRT), 2012
- A Line BRT (Arterial BRT), 2015
- CTIB Program of Projects
- MnDOT Average Bid Prices for Awarded Projects

The unit price assumptions from these sources will be reviewed to determine applicability to the West Broadway Transit Study alternatives and compatibility with the methodology and format being used. In all cases the unit prices are adjusted to base year dollars using the annual escalation factor.

Typical unit costs that will be used for the West Broadway Transit Study estimate are identified in the following section. Additional unit costs, as necessary, will be added into the estimate based on the conceptual design that is developed.

### SCC 10 – Guideway

The Guideway SCC includes all of the civil and structural costs directly associated with construction of the guideway structures, roadbed, and pavement or track.

Typical guideway unit cost line items include:

- At-grade guideway (route-foot)
- Aerial guideway (route-foot)
- Cut-and-cover tunnel guideway (route-foot)
- Guideway retaining walls (square foot)
- Bridge modification or reconstruction (square foot)
- BRT roadway (route-foot) (arterial)
- Streetcar track (route-foot)



### SCC 20 – Stations

The Stations SCC includes construction costs for station platforms, ramps, platform fixtures, canopies, and passenger amenities, along with costs for vertical circulation (elevators, escalators, and stairs) to the platform, where necessary.

Typical unit cost line items in this category include:

- Streetcar station platforms (station)
- BRT station platforms (station)
- Vertical circulation (stairs, elevator, escalator)

### SCC 30 – Support Facilities

The Support Facilities SCC includes the capital cost of operations, maintenance, and storage facilities for the corridor. For the West Broadway streetcar alternative, it is assumed that either excess capacity will be available at the proposed Nicollet Central maintenance facility or a new facility will be constructed adjacent to the West Broadway corridor. During this study, potential sites for a streetcar operations and maintenance facility will be investigated and included in the capital cost estimates.

The requirements for BRT support facilities are dependent on the type of vehicle, the size of the fleet, and the maintenance needs of the system. The BRT alternatives will be assumed to utilize low-floor hybrid diesel-electric buses. It is currently unclear whether an entirely new facility would be needed to support a West Broadway BRT line or whether existing Metro Transit facilities could be modified and expanded to meet the need. If modifications to an existing facility or construction of a new facility is determined to be required, capital costs will be included as part of the BRT alternative.

### SCC 40 – Sitework and Special Conditions

The Sitework and Special Conditions SCC includes estimated costs for all other construction activities that are not accounted for in the Guideway, Stations, Support Facilities, or Systems categories.

Typical Sitework and Special Conditions Unit Cost line items include:

- Utility relocation allowance (route-foot)
- Soil and water remediation allowance (route-foot)
- Environmental mitigation allowance (route-foot)
- Roadway construction (square foot)
- Roadway structures (square foot)
- Trails (square foot)
- Fencing (linear foot)
- Lighting allowance (route-foot)
- Landscaping allowance (route-foot)
- Traffic Control Allowance (route-foot)



### SCC 50 – Systems

The Systems SCC includes capital costs for many elements, including train control signals; communication systems; central control hardware and software; traction power substations; overhead catenary systems; underground ductbanks; automated fare collection; grade crossing protection; and roadway traffic signal systems.

Typical systems unit cost line items include:

- Ductbank allowance (route-foot)
- Train control signal allowance (route-foot)
- Grade crossing protection (each)
- Traffic signals (each)
- Traction power substations (each)
- Overhead catenary system allowance (route-foot)
- Corrosion control allowance (route-foot)
- Communications backbone allowance (route-foot)
- Station communications (station)
- Automated fare collection (station)
- Central control allowance (route-foot)

### SCC 60 – Right-of-Way

The Right-of-Way SCC includes costs for acquisition of right-of-way needed for construction and operation of the project. In the West Broadway Transit Study, right-of-way requirements are anticipated along portions of the corridor, at stations, at traction power substations, and at the operations and maintenance facility. However, the specific needs and actual costs will not be known until detailed design is underway.

For this study, a high-level review of the right-of-way impacts will be performed to determine partial and full parcel acquisitions for the project. In coordination with Hennepin County and Metro Transit, right-of-way unit prices for full and partial parcel acquisitions, based on tax-appraised values, will be developed to determine approximate right-of-way costs. Additional quantities will be estimated for other non-guideway right-of-way needs and potential relocation costs. The unit costs will reflect the general land use characteristics of the area.

Typical right-of-way unit cost line items include:

- Residential (acre)
- Commercial (acre)
- Industrial (acre)
- State/county/municipal right-of-way (acre)
- Relocations (lump sum)





### SCC 70 – Vehicles

The Vehicles SCC includes costs for streetcar vehicles, BRT buses, and standard buses. It also includes an allowance for other service vehicles to support operations and maintenance.

Typical vehicle unit cost line items include:

- Streetcar rail vehicle (each)
- Low-floor 40-foot bus (each)
- Standard 40-foot bus (each)
- Non-revenue vehicle allowance (route-mile)
- Spare Ratio (Additional 15% of the vehicles required)

### SCC 80 – Professional Services

Cost estimates for the Professional Services SCC are generated by applying assumed rates to different categories of the estimate. Table 2 lists the professional services assumptions to be incorporated into the capital cost estimates.

Table 2 - Professional Services Estimated Rates

Description	Construction	Right-of-way	Vehicles
Preliminary Engineering	2%	-	-
Final Design	5%	2%	1%
Project Management for Design and Construction	2%	2%	2%
Construction Administration and Management	8%	1%	-
Insurance	4%	-	-
Legal: Permits: Review fees by Other Agencies	1%	5%	-
Surveys, Testing, Investigation , Inspection	2%	10%	2%
Agency Force Account Work	6%	10%	1%
Total	30%	30%	6%

## 4. Basis of the Estimate

The West Broadway Transit Study capital cost estimates are to be based upon the alternatives as defined in Detailed Definition of Alternatives Report. The report will be accompanied by conceptual design drawings for each alternative, which are developed to provide sufficient information to estimate quantities for the various capital cost elements.



This section identifies and describes many of the specific assumptions regarding the alternatives that are necessary to prepare the capital cost estimates. In conjunction with the Detailed Definition of Alternatives and the conceptual design drawings, these assumptions represent the basis of the capital cost estimates. Where necessary, this information is supplemented by analysis and results from other project tasks, including ridership forecasting, operations planning, and environmental assessment.

### No-Build Alternative

The No Build Alternative would undertake very little construction with minor improvements to existing services and structures along the route.

### BRT and Streetcar Alternatives

The detailed definition and conceptual design of the BRT and Streetcar Alternative will be evaluated, quantified, and summarized in terms of the various unit cost elements required for the capital cost estimate.

#### Guideway

The principal guideway components of each individual alternative are represented by a limited number of typical cross sections along the entire route. In addition to typical section costs, assumptions about significant guideway structures (bridges, tunnels, retaining walls) are identified and quantified for each alternative.

#### Stations

The station elements of each alternative are defined and quantified for each individual BRT or Streetcar station, and will include typical platforms and amenities, vertical circulation for grade separated stations, feeder bus drop-off and layover facilities, and pedestrian/bicycle access elements within the station.

Typical platform sizes for BRT and Streetcar stations are dictated by the assumed operating plan for each alternative.

#### Support Facilities

The assumed requirements and locations for support facilities are identified in the detailed definition of alternatives, the conceptual design, and the operating plan.

#### Sitework and Special Conditions

Assumed quantities for the various items in this category are determined from the conceptual design of each alternative. In cases where the unit cost allowances are classified by degree of potential impact or mitigation, the designation is made with guidance from the project environmental planners.

#### Systems

The systems elements assumed for the BRT alternative are based upon the requirements of the corresponding operating environment, with service characteristics similar to LRT.



For each of the modes included, the systems elements include passenger communication systems and automated fare collection systems at each station, a communication backbone, and allowances for some type of central control and monitoring system. Traffic signal system upgrades are assumed at some intersections along the guideway to accommodate transit signal priority.

In addition, the streetcar alternative includes quantities for typical grade crossings and substations, and allowances for systems ductbanks, train control signals, overhead catenary systems, and corrosion control requirements.

### Right-of-way

The right-of-way requirements are derived from the detailed definition and conceptual design of each alternative. For continuous guideway right-of-way, the quantities are estimated by the route length. Right-of-way needs for stations, park-and-ride facilities, substations, and support facilities will be quantified by typical requirements for each element. In all cases, the right-of-way quantities will be further classified by assumed land use characteristics or ownership.

In addition, the capital cost estimates will quantify and classify locations where specific relocations are identified by the conceptual design.

### Vehicles

The vehicle requirements for BRT and Streetcar service are specified in the operating plans for the various alternatives. The mainline BRT vehicles are assumed to be low-floor 40-foot buses, and the streetcar vehicles are assumed to be modern streetcar vehicles. In all cases, the assumed quantity of additional standard 40-foot buses will be taken from the operating plan. The quantities for all vehicles will be adjusted to reflect a spare ratio of not less than 15 percent.

The basis of the non-revenue vehicle allowance for each alternative is the total route length.

## West Broadway Transit Study

Capital Cost Estimate Summary

9/3/2015

	Alternative 1 - Arterial BRT	Alternative 2 - Streetcar	
	Bus Rapid Transit from Downtown Minneapolis to downtown Robbinsdale <b>Total (2015\$)</b>	Alternative 2A - Two-way track on Washington Avenue in North Loop <b>Total (2015\$)</b>	Alternative 2B - One-way couplet on Washington Avenue & 2nd Street in North Loop <b>Total (2015\$)</b>
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>	\$60,000	\$42,307,000	\$42,561,800
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>	\$3,012,000	\$2,040,000	\$2,040,000
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>	\$5,400,000	\$10,800,000	\$10,800,000
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>	\$4,108,800	\$30,471,700	\$31,440,400
<b>50 SYSTEMS</b>	\$10,689,600	\$35,746,200	\$36,352,300
<b>SUBTOTAL - INFRASTRUCTURE</b>	<b>\$23,270,400</b>	<b>\$121,364,900</b>	<b>\$123,194,500</b>
<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>	\$28,000	\$3,220,000	\$3,220,000
<b>70 VEHICLES</b>	\$4,488,750	\$36,350,500	\$36,346,300
<b>80 PROFESSIONAL SERVICES</b>	\$6,081,000	\$33,556,410	\$34,023,540
<b>90 UNALLOCATED CONTINGENCY</b>	\$5,922,500	\$34,887,600	\$35,276,100
<b>Total</b>	<b>\$39,800,000</b>	<b>\$229,380,000</b>	<b>\$232,070,000</b>

<b>Total Length (mi)</b>	6.0	4.1	4.1
<b>Total # of Stations</b>	19	13	13
<b>Total Cost / Mile</b>	\$6,622,296	\$55,701,899	\$56,539,756

<b>Total # of New Traffic Signals</b>	0	1	1
<b>Total # of TSP Intersections</b>	26	24	28
<b>Total # of Buses / Streetcars</b>	9	8	8

<b>SUBTOTAL - NICOLLET-CENTRAL SEGMENT</b>	<b>\$26,170,000</b>	<b>\$27,810,000</b>
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<b>PROJECT TOTAL (with Nicollet-Central segment)</b>	<b>\$255,550,000</b>	<b>\$259,880,000</b>
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### Cost Estimate Assumptions

- Changes to local bus infrastructure are not included as part of this estimate.
- Right-of-way costs are based on information obtained from Hennepin County.
- Power line relocation costs are not included as part of this estimate. It is assumed that station construction would not impact the existing lines.
- Station platform improvements include the full reconstruction of the existing sidewalk and roadway curb/gutter within the limits of the platform.
- In-slab radiant heat in the platform sidewalk areas is not included as part of this estimate.
- Pavement within platform area is assumed to be concrete pavement.
- Shelter sizes are determined based on daily ridership boarding projections for this corridor and a qualitative assessment of shared use with other corridors.
- Shelter configuration for arterial BRT is similar in concept to those developed as part of the A Line BRT project.
- TVM's are provided at each station location.
- Two on-board validators are assumed for each bus.
- Additional site improvements are based on aerial and site photography and generally relate to potential costs associated with impacts to vertical elements that are located adjacent to proposed platform locations. There are potential costs associated with impacts to unknown elements of the site.
- Stations for arterial BRT and streetcar are assumed to be identical - level boarding is NOT assumed for the streetcar alternative.

**West Broadway Transit Study**  
Capital Cost Estimate Summary

9/3/2015

FTA SCC Code	Description	Alternative 1 - Arterial BRT			Alternative 2 - Streetcar							
		Bus Rapid Transit from Downtown Minneapolis to downtown Robbinsdale			Alternative 2A - Two-way track on Washington Avenue in North Loop			Alternative 2B - One-way couplet on Washington Avenue & 2nd Street in North Loop				
		Subtotal	Allocated Contingency	Total (2015\$)	Subtotal	Allocated Contingency	Total (2015\$)	Subtotal	Allocated Contingency	Total (2015\$)		
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>			20%	\$ 60,000		20%	\$ 42,307,000		20%	\$ 42,561,800		
1	10.01	Guideway: At-grade exclusive right-of-way		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
2	10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)		\$ -	\$ -	\$ 70,000	\$ 14,000	\$ 84,000	\$ 70,000	\$ 14,000	\$ 84,000	
3	10.03	Guideway: At-grade in mixed traffic	\$ 50,000	\$ 10,000	\$ 60,000	\$ 4,370,000	\$ 874,000	\$ 5,244,000	\$ 4,329,000	\$ 865,800	\$ 5,194,800	
4	10.04	Guideway: Aerial structure	\$ -	\$ -	\$ -	\$ 13,100,000	\$ -	\$ 13,100,000	\$ 13,300,000	\$ -	\$ 13,300,000	
9	10.09	Track: Direct fixation	\$ -	\$ -	\$ -	\$ 153,000	\$ 30,600	\$ 183,600	\$ 149,100	\$ 29,800	\$ 178,900	
10	10.10	Track: Embedded	\$ -	\$ -	\$ -	\$ 17,131,200	\$ 3,426,200	\$ 20,557,400	\$ 16,971,800	\$ 3,394,300	\$ 20,366,100	
11	10.11	Track: Ballasted	\$ -	\$ -	\$ -	\$ 315,000	\$ 63,000	\$ 378,000	\$ 315,000	\$ 63,000	\$ 378,000	
12	10.12	Track: Special (switches, turnouts)	\$ -	\$ -	\$ -	\$ 2,300,000	\$ 460,000	\$ 2,760,000	\$ 2,550,000	\$ 510,000	\$ 3,060,000	
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>			20%	\$ 3,012,000		20%	\$ 2,040,000		20%	\$ 2,040,000		
14	20.01	At-grade station, stop, shelter, mall, terminal, platform	\$ 2,510,000	\$ 502,000	\$ 3,012,000	\$ 1,700,000	\$ 340,000	\$ 2,040,000	\$ 1,700,000	\$ 340,000	\$ 2,040,000	
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>			20%	\$ 5,400,000		20%	\$ 10,800,000		20%	\$ 10,800,000		
22	30.02	Light Maintenance Facility	\$ -	\$ -	\$ -	\$ 5,000,000	\$ 1,000,000	\$ 6,000,000	\$ 5,000,000	\$ 1,000,000	\$ 6,000,000	
24	30.04	Storage or Maintenance of Way Building	\$ 4,500,000	\$ 900,000	\$ 5,400,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
25	30.05	Yard and Yard Track	\$ -	\$ -	\$ -	\$ 4,000,000	\$ 800,000	\$ 4,800,000	\$ 4,000,000	\$ 800,000	\$ 4,800,000	
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>			20%	\$ 4,108,800		20%	\$ 30,471,700		20%	\$ 31,440,400		
26	40.01	Demolition, Clearing, Earthwork	\$ 557,000	\$ 111,400	\$ 668,400	\$ 1,420,600	\$ 284,100	\$ 1,704,700	\$ 1,358,500	\$ 271,700	\$ 1,630,200	
27	40.02	Site Utilities, Utility Relocation	\$ 309,000	\$ 61,800	\$ 370,800	\$ 13,265,000	\$ 2,653,000	\$ 15,918,000	\$ 13,118,000	\$ 2,623,600	\$ 15,741,600	
28	40.03	Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	\$ 20,000	\$ 4,000	\$ 24,000	\$ 500,000	\$ 100,000	\$ 600,000	\$ 510,000	\$ 102,000	\$ 612,000	
30	40.05	Site structures including retaining walls, sound walls	\$ -	\$ -	\$ -	\$ 393,800	\$ 78,800	\$ 472,600	\$ 393,800	\$ 78,800	\$ 472,600	
31	40.06	Pedestrian / bike access and accommodation, landscaping	\$ 1,418,000	\$ 283,600	\$ 1,701,600	\$ 1,926,200	\$ 385,200	\$ 2,311,400	\$ 1,945,200	\$ 389,000	\$ 2,334,200	
32	40.07	Automobile, bus, van accessways including roads, parking lots	\$ 968,000	\$ 193,600	\$ 1,161,600	\$ 5,702,500	\$ 1,140,500	\$ 6,843,000	\$ 6,710,300	\$ 1,342,100	\$ 8,052,400	
33	40.08	Temporary Facilities and other indirect costs during construction	\$ 152,000	\$ 30,400	\$ 182,400	\$ 2,185,000	\$ 437,000	\$ 2,622,000	\$ 2,164,500	\$ 432,900	\$ 2,597,400	
<b>50 SYSTEMS</b>			20%	\$ 10,689,600		20%	\$ 35,746,200		20%	\$ 36,352,300		
34	50.01	Train control and signals	\$ -	\$ -	\$ -	\$ 1,811,000	\$ 362,200	\$ 2,173,200	\$ 1,798,700	\$ 359,800	\$ 2,158,500	
35	50.02	Traffic signals and crossing protection	\$ 505,000	\$ 101,000	\$ 606,000	\$ 4,315,000	\$ 863,000	\$ 5,178,000	\$ 4,945,000	\$ 989,000	\$ 5,934,000	
36	50.03	Traction power supply: substations	\$ -	\$ -	\$ -	\$ 6,000,000	\$ 1,200,000	\$ 7,200,000	\$ 6,000,000	\$ 1,200,000	\$ 7,200,000	
37	50.04	Traction power distribution: catenary and third rail	\$ -	\$ -	\$ -	\$ 12,012,500	\$ 2,402,500	\$ 14,415,000	\$ 11,899,800	\$ 2,380,000	\$ 14,279,800	
38	50.05	Communications	\$ 5,380,000	\$ 1,076,000	\$ 6,456,000	\$ 3,550,000	\$ 710,000	\$ 4,260,000	\$ 3,550,000	\$ 710,000	\$ 4,260,000	
39	50.06	Fare collection system and equipment	\$ 3,032,000	\$ 595,600	\$ 3,627,600	\$ 2,000,000	\$ 400,000	\$ 2,400,000	\$ 2,000,000	\$ 400,000	\$ 2,400,000	
40	50.07	Central Control	\$ -	\$ -	\$ -	\$ 100,000	\$ 20,000	\$ 120,000	\$ 100,000	\$ 20,000	\$ 120,000	
<b>SUBTOTAL - INFRASTRUCTURE</b>				\$ 23,270,400			\$ 121,364,900			\$ 123,194,500		
<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>			100%	\$ 28,000		100%	\$ 3,220,000		100%	\$ 3,220,000		
41	60.01	Purchase or lease of real estate	\$ 14,000	\$ 14,000	\$ 28,000	\$ 1,610,000	\$ 1,610,000	\$ 3,220,000	\$ 1,610,000	\$ 1,610,000	\$ 3,220,000	
42	60.02	Relocation of existing households and businesses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>70 VEHICLES</b>			5%	\$ 4,488,750		5%	\$ 36,350,500		5%	\$ 36,346,300		
46	70.04	Bus	\$ 4,275,000	\$ 213,750	\$ 4,488,750	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
47	70.05	Other	\$ -	\$ -	\$ -	\$ 33,600,000	\$ 1,680,000	\$ 35,280,000	\$ 33,600,000	\$ 1,680,000	\$ 35,280,000	
48	70.06	Non-revenue vehicles	\$ -	\$ -	\$ -	\$ 219,500	\$ 11,000	\$ 230,500	\$ 215,500	\$ 10,800	\$ 226,300	
49	70.07	Spare parts	\$ -	\$ -	\$ -	\$ 800,000	\$ 40,000	\$ 840,000	\$ 800,000	\$ 40,000	\$ 840,000	
<b>80 PROFESSIONAL SERVICES</b>			0%	\$ 6,081,000		0%	\$ 33,556,410		0%	\$ 34,023,540		
50	80.00	Infrastructure	E & A 30.00%	\$ 5,820,300	\$ -	\$ 5,820,300	\$ 30,996,240	\$ -	\$ 30,996,240	\$ 31,463,610	\$ -	\$ 31,463,610
51	80.00	Right-of-Way	E & A 30.00%	\$ 4,200	\$ -	\$ 4,200	\$ 483,000	\$ -	\$ 483,000	\$ 483,000	\$ -	\$ 483,000
52	80.00	Vehicle	E & A 6.00%	\$ 256,500	\$ -	\$ 256,500	\$ 2,077,170	\$ -	\$ 2,077,170	\$ 2,076,930	\$ -	\$ 2,076,930
<b>90 UNALLOCATED CONTINGENCY</b>				\$ 5,922,500			\$ 34,887,600			\$ 35,276,100		
53	90.00	Unallocated Contingency	25%	\$ 5,922,500			\$ 34,887,600			\$ 35,276,100		
				<b>Total</b>	<b>\$ 39,800,000</b>	<b>Total</b>	<b>\$ 229,380,000</b>	<b>Total</b>	<b>\$ 232,070,000</b>			

**Nicollet-Central segment**

<b>SUBTOTAL - INFRASTRUCTURE</b>				\$ 14,094,000	\$ 3,452,900	\$ 17,546,900	\$ 14,978,000	\$ 3,667,700	\$ 18,645,700		
<b>80 PROFESSIONAL SERVICES</b>				\$ 4,228,200	\$ -	\$ 4,228,200	\$ 4,493,400	\$ -	\$ 4,493,400		
<b>90 UNALLOCATED CONTINGENCY</b>				\$ -	\$ -	\$ -	\$ 4,386,725	\$ -	\$ 4,661,425		
				<b>Subtotal</b>	<b>\$ 26,170,000</b>	<b>Subtotal</b>	<b>\$ 27,810,000</b>				
				<b>Total w/ N.C. Segment</b>	<b>\$ 255,550,000</b>	<b>Total w/ N.C. Segment</b>	<b>\$ 259,880,000</b>				

**West Broadway Transit Study**

**Estimate Basics**

Arterial BRT

Length (mi)	No. of Stations	Bumpout	Curbside	Floating
6.01	19	18	8	10

FTA SCC Code	Description	Quantity	Unit	Unit Cost	Subtotal	Allocated Contingency	Total (2015\$)	
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>							<b>20%</b>	<b>\$ 60,000</b>
1	10.03	Mixed Traffic Lanes	6.01	MI	\$0.00	\$0	\$0	
2	10.03	Roadway Re-Striping Allowance	1	LS	\$50,000.00	\$50,000	\$10,000	
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>							<b>20%</b>	<b>\$ 3,012,000</b>
3	20.01	Small Shelter	12	EA	\$ 40,000	\$ 480,000	\$ 96,000	
4	20.01	Medium Shelter	10	EA	\$ 65,000	\$ 650,000	\$ 130,000	
5	20.01	Large Shelter	13	EA	\$ 90,000	\$ 1,170,000	\$ 234,000	
6	20.01	Transit Center (pylon only)	2	EA	\$ 10,000	\$ 20,000	\$ 4,000	
7	20.01	Public Art	1	LS	\$ 190,000	\$ 190,000	\$ 38,000	
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>							<b>20%</b>	<b>\$ 4,108,800</b>
8	40.01	100' Bumpout Demolition	1	EA	\$ 19,000	\$ 19,000	\$ 3,800	
9	40.01	80' Bumpout Demolition	13	EA	\$ 16,000	\$ 208,000	\$ 41,600	
10	40.01	60' Bumpout Demolition	4	EA	\$ 14,000	\$ 56,000	\$ 11,200	
11	40.01	80' Curbside Demolition	3	EA	\$ 8,000	\$ 24,000	\$ 4,800	
12	40.01	60' Curbside Demolition	5	EA	\$ 7,000	\$ 35,000	\$ 7,000	
13	40.01	80' Floating Demolition	5	EA	\$ 18,000	\$ 90,000	\$ 18,000	
14	40.01	70' Floating Demolition	3	EA	\$ 17,000	\$ 51,000	\$ 10,200	
15	40.01	60' Floating Demolition	2	EA	\$ 16,000	\$ 32,000	\$ 6,400	
16	40.01	26th Street EB Roadway Improvements	1	LS	\$ 42,000	\$ 42,000	\$ 8,400	
17	40.02	Utilities and Drainage Improvements (Minor)	30	EA	\$ 6,000	\$ 180,000	\$ 36,000	
18	40.02	Utilities and Drainage Improvements (Major)	3	EA	\$ 23,000	\$ 69,000	\$ 13,800	
19	40.02	Relocate Signal Mast Arm	3	EA	\$ 20,000	\$ 60,000	\$ 12,000	
20	40.03	Contam'd soil removal/mitigation Allowance	1	LS	\$ 20,000.00	\$ 20,000	\$ 4,000	
21	40.06	100' Bumpout Sidewalk/Pedestrian Improvements	1	EA	\$ 50,000	\$ 50,000	\$ 10,000	
22	40.06	80' Bumpout Sidewalk/Pedestrian Improvements	13	EA	\$ 44,000	\$ 572,000	\$ 114,400	
23	40.06	60' Bumpout Sidewalk/Pedestrian Improvements	4	EA	\$ 38,000	\$ 152,000	\$ 30,400	
24	40.06	80' Curbside Sidewalk/Pedestrian Improvements	3	EA	\$ 19,000	\$ 57,000	\$ 11,400	
25	40.06	60' Curbside Sidewalk/Pedestrian Improvements	5	EA	\$ 15,000	\$ 75,000	\$ 15,000	
26	40.06	80' Floating Sidewalk/Pedestrian/Bike Improvements	5	EA	\$ 54,000	\$ 270,000	\$ 54,000	
27	40.06	70' Floating Sidewalk/Pedestrian/Bike Improvements	3	EA	\$ 50,000	\$ 150,000	\$ 30,000	
28	40.06	60' Floating Sidewalk/Pedestrian/Bike Improvements	2	EA	\$ 46,000	\$ 92,000	\$ 18,400	
29	40.07	100' Bumpout Street Improvements	1	EA	\$ 33,000	\$ 33,000	\$ 6,600	
30	40.07	80' Bumpout Street Improvements	13	EA	\$ 28,000	\$ 364,000	\$ 72,800	
31	40.07	60' Bumpout Street Improvements	4	EA	\$ 24,000	\$ 96,000	\$ 19,200	
32	40.07	80' Curbside Street Improvements	3	EA	\$ 22,000	\$ 66,000	\$ 13,200	
33	40.07	60' Curbside Street Improvements	5	EA	\$ 17,000	\$ 85,000	\$ 17,000	
34	40.07	80' Floating Street Improvements	5	EA	\$ 34,000	\$ 170,000	\$ 34,000	
35	40.07	70' Floating Street Improvements	3	EA	\$ 32,000	\$ 96,000	\$ 19,200	
36	40.07	60' Floating Street Improvements	2	EA	\$ 29,000	\$ 58,000	\$ 11,600	
37	40.08	Traffic Control	19	EA	\$ 8,000	\$ 152,000	\$ 30,400	
<b>50 SYSTEMS</b>							<b>20%</b>	<b>\$ 10,689,600</b>
38	50.02	Pedestrian Traffic Signal (Broadway Ave & Ilion Ave)	1	EA	\$ 75,000	\$ 75,000	\$ 15,000	
39	50.02	Transit Signal Priority (Major Intersection)	12	EA	\$ 10,000	\$ 120,000	\$ 24,000	
40	50.02	Transit Signal Priority (Minor Intersection)	14	EA	\$ 15,000	\$ 210,000	\$ 42,000	
41	50.02	TSP Central System Upgrades	1	LS	\$ 100,000	\$ 100,000	\$ 20,000	
42	50.05	Station Communication/Electrical Allowance (Emergency Phone, Readerboards, Cameras, Wireless Connection)	37	EA	\$ 140,000	\$ 5,180,000	\$ 1,036,000	
43	50.05	Communications Central System Upgrades	1	LS	\$ 200,000	\$ 200,000	\$ 40,000	
44	50.06	Fare Collection Allowance (1 TVM, 1 Validator)	37	EA	\$ 80,000	\$ 2,960,000	\$ 592,000	
45	50.06	Fare Enforcement Equipment (per enforcement officer)		EA	\$ 4,000	\$ -	\$ -	
46	50.06	On-Board Go To Validator (per bus door)	18	EA	\$ 4,000	\$ 72,000	\$ 3,600	
<b>SUBTOTAL - INFRASTRUCTURE</b>					<b>Subtotal</b>		<b>\$17,870,400</b>	
<b>60 RIGHT OF WAY</b>							<b>100%</b>	<b>\$28,000</b>
47	60.01	Commercial (29th Ave Vet property)	350	SF	\$ 40	\$ 14,000	\$ 14,000	
48	60.01	Residential	0	SF	\$ -	\$ -	\$ -	
<b>70 VEHICLES</b>							<b>5%</b>	<b>\$4,488,750</b>
49	70.04	Low Floor 40-foot Buses	9	EA	\$ 475,000	\$ 4,275,000	\$ 213,750	
50	70.04	Low Floor 60-foot Buses		EA	\$ 915,000	\$ -	\$ -	
51	70.04	Hybrid buses		EA	\$ 1,186,000	\$ -	\$ -	

**West Broadway Transit Study**

Streetcar - North of 10th Ave and 2nd St

Estimate Basics

Start Sta	End Sta	Length (ft)	Length (mi)	# of Stations	# TSP Intersect.
00+00	169+73	16973	3.21	10	17

FTA SCC Code	Description	Quantity	Unit	Unit Cost	Extension	Allocated Contingency	Total (2015\$)
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>					\$ 25,052,600	20%	\$ 28,583,100
1	10.01		RF	\$ -	\$ -	\$ -	\$ -
2	10.02	2,800	LF	\$ 25.00	\$ 70,000	\$ 14,000	\$ 84,000
3	10.03	33,960	TF	\$ 100.00	\$ 3,396,000	\$ 679,200	\$ 4,075,200
4	10.04		RF	\$ 7,000.00	\$ -	\$ -	\$ -
5	10.04	1	LS	\$ 7,400,000.00	\$ 7,400,000	\$ -	\$ 7,400,000
6	10.09	720	TF	\$ 150.00	\$ 108,000	\$ 21,600	\$ 129,600
7	10.10	31,840	TF	\$ 415.00	\$ 13,213,600	\$ 2,642,700	\$ 15,856,300
8	10.11	1,400	TF	\$ 225.00	\$ 315,000	\$ 63,000	\$ 378,000
9	10.12	2	EA	\$ 75,000.00	\$ 150,000	\$ 30,000	\$ 180,000
10	10.12	1	EA	\$ 400,000.00	\$ 400,000	\$ 80,000	\$ 480,000
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>					\$ 1,080,000	20%	\$ 1,296,000
11	20.01	10	EA	\$ 40,000.00	\$ 400,000	\$ 80,000	\$ 480,000
12	20.01	2	EA	\$ 65,000.00	\$ 130,000	\$ 26,000	\$ 156,000
13	20.01	6	EA	\$ 90,000.00	\$ 540,000	\$ 108,000	\$ 648,000
14	20.01	1	EA	\$ 10,000.00	\$ 10,000	\$ 2,000	\$ 12,000
15	20.01	1	LS	\$ 100,000.00	\$ 100,000	\$ 20,000	\$ 120,000
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN, BLDGS</b>					\$ 9,000,000	20%	\$ 10,800,000
16	30.02	1	EA	\$ 5,000,000.00	\$ 5,000,000	\$ 1,000,000	\$ 6,000,000
17	30.05	1	EA	\$ 4,000,000.00	\$ 4,000,000	\$ 800,000	\$ 4,800,000
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>					\$ 19,681,300	20%	\$ 23,617,600
18	40.01	18,167	CY	\$ 15.00	\$ 272,500	\$ 54,500	\$ 327,000
19	40.01	36,178	SY	\$ 3.00	\$ 108,500	\$ 21,700	\$ 130,200
20	40.01	4245	RF	\$ 50.00	\$ 212,300	\$ 42,450	\$ 254,800
21	40.01	7	EA	\$ 16,000.00	\$ 112,000	\$ 22,400	\$ 134,400
22	40.01		EA	\$ 14,000.00	\$ -	\$ -	\$ -
23	40.01	3	EA	\$ 8,000.00	\$ 24,000	\$ 4,800	\$ 28,800
24	40.01	4	EA	\$ 7,000.00	\$ 28,000	\$ 5,600	\$ 33,600
25	40.01	1	EA	\$ 18,000.00	\$ 18,000	\$ 3,600	\$ 21,600
26	40.01	2	EA	\$ 17,000.00	\$ 34,000	\$ 6,800	\$ 40,800
27	40.01	1	EA	\$ 16,000.00	\$ 16,000	\$ 3,200	\$ 19,200
28	40.01	1	LS	\$ 42,000.00	\$ 42,000	\$ 8,400	\$ 50,400
29	40.01	1	LS	\$ 275,000.00	\$ 275,000	\$ 55,000	\$ 330,000
30	40.02	33,960	TF	\$ 300.00	\$ 10,188,000	\$ 2,037,600	\$ 12,225,600
31	40.02	17	EA	\$ 4,000.00	\$ 68,000	\$ 13,600	\$ 81,600
32	40.02	3	EA	\$ 21,000.00	\$ 63,000	\$ 12,600	\$ 75,600
33	40.03	1	LS	\$ 380,000.00	\$ 380,000	\$ 76,000	\$ 456,000
34	40.05	2,625	SF	\$ 150.00	\$ 393,800	\$ 78,800	\$ 472,600
35	40.06	7	EA	\$ 44,000.00	\$ 308,000	\$ 61,600	\$ 369,600
36	40.06		EA	\$ 38,000.00	\$ -	\$ -	\$ -
37	40.06	3	EA	\$ 19,000.00	\$ 57,000	\$ 11,400	\$ 68,400
38	40.06	4	EA	\$ 15,000.00	\$ 60,000	\$ 12,000	\$ 72,000
39	40.06	1	EA	\$ 54,000.00	\$ 54,000	\$ 10,800	\$ 64,800
40	40.06	2	EA	\$ 50,000.00	\$ 100,000	\$ 20,000	\$ 120,000
41	40.06	1	EA	\$ 46,000.00	\$ 46,000	\$ 9,200	\$ 55,200
42	40.06	33,960	TF	\$ 20.00	\$ 679,200	\$ 135,800	\$ 815,000
43	40.06	68	EA	\$ 1,200.00	\$ 81,600	\$ 16,300	\$ 97,900
44	40.07	7	EA	\$ 28,000.00	\$ 196,000	\$ 39,200	\$ 235,200
45	40.07		EA	\$ 24,000.00	\$ -	\$ -	\$ -
46	40.07	3	EA	\$ 22,000.00	\$ 66,000	\$ 13,200	\$ 79,200
47	40.07	4	EA	\$ 17,000.00	\$ 68,000	\$ 13,600	\$ 81,600
48	40.07	1	EA	\$ 34,000.00	\$ 34,000	\$ 6,800	\$ 40,800
49	40.07	2	EA	\$ 32,000.00	\$ 64,000	\$ 12,800	\$ 76,800
50	40.07	1	EA	\$ 29,000.00	\$ 29,000	\$ 5,800	\$ 34,800
51	40.07	16,980	RF	\$ 230	\$ 3,905,400	\$ 781,100	\$ 4,686,500
52	40.08	33,960	TF	\$ 50.00	\$ 1,698,000	\$ 339,600	\$ 2,037,600
<b>50 SYSTEMS</b>					\$ 22,857,800	20%	\$ 27,429,400
53	50.01	1	EA	\$ 500,000	\$ 500,000	\$ 100,000	\$ 600,000
54	50.01	33,960	TF	\$ 30	\$ 1,018,800	\$ 203,800	\$ 1,222,600
55	50.02	1	EA	\$ 75,000	\$ 75,000	\$ 15,000	\$ 90,000
56	50.02	1	EA	\$ 250,000	\$ 250,000	\$ 50,000	\$ 300,000
57	50.02	17	EA	\$ 150,000	\$ 2,550,000	\$ 510,000	\$ 3,060,000
58	50.02	5	EA	\$ 15,000	\$ 75,000	\$ 15,000	\$ 90,000
59	50.02	12	EA	\$ 10,000	\$ 120,000	\$ 24,000	\$ 144,000
60	50.02	1	LS	\$ 100,000	\$ 100,000	\$ 20,000	\$ 120,000
61	50.03	3	EA	\$ 1,500,000	\$ 4,500,000	\$ 900,000	\$ 5,400,000
62	50.04	8,490	RF	\$ 100	\$ 849,000	\$ 169,800	\$ 1,018,800
63	50.04	33,960	TF	\$ 250	\$ 8,490,000	\$ 1,698,000	\$ 10,188,000
64	50.05	1	LS	\$ 50,000	\$ 50,000	\$ 10,000	\$ 60,000
65	50.05	19	EA	\$ 140,000	\$ 2,660,000	\$ 532,000	\$ 3,192,000
66	50.06	19	EA	\$ 80,000	\$ 1,520,000	\$ 304,000	\$ 1,824,000
67	50.06		EA	\$ 4,000	\$ -	\$ -	\$ -
68	50.07	1	LS	\$ 100,000	\$ 100,000	\$ 20,000	\$ 120,000

<b>SUBTOTAL - INFRASTRUCTURE</b>	<b>Subtotal \$ 77,671,700</b>	<b>\$ 91,726,100</b>
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<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>				\$	1,610,000	100%	\$	3,220,000
69	60.01	Parcel 1602924240177 purchase (Irving, assessed \$60K)	1	LS	\$ 100,000.00	\$ 100,000	\$ 100,000	\$ 200,000
70	60.01	Parcel 0802924430074 purchase (29th Ave, assessed \$4.5K)	1	LS	\$ 10,000.00	\$ 10,000	\$ 10,000	\$ 20,000
71	60.01	Parcel 0802924430102 purchase (29th Ave, assessed \$160K)	1	LS	\$ 200,000.00	\$ 200,000	\$ 200,000	\$ 400,000
72	60.01	Parcel 0802924240064 partial acquisition (NMH)	1	LS	\$ 300,000.00	\$ 300,000	\$ 300,000	\$ 600,000
73	60.01	Full Parcel acquisition (OMF)	1	LS	\$ 1,000,000.00	\$ 1,000,000	\$ 1,000,000	\$ 2,000,000
74	60.02	Relocation of existing households and businesses		AC	\$ -	\$ -	\$ -	\$ -
<b>70 VEHICLES</b>					<b>\$ 34,569,800</b>	<b>5%</b>	<b>\$ 36,298,300</b>	
75	70.05	Modern Streetcar	8	EA	\$ 4,200,000.00	\$ 33,600,000	\$ 1,680,000	\$ 35,280,000
76	70.06	Vehicles: Non-revenue Vehicle Allowance	16,980	RF	\$ 10.00	\$ 169,800	\$ 8,500	\$ 178,300
77	70.07	Vehicles: Spare Parts Allowance	8	EA	\$ 100,000.00	\$ 800,000	\$ 40,000	\$ 840,000



**West Broadway Transit Study**

Streetcar - North Loop Option 1 (Washington two-way)

Estimate Basics

Start Sta	End Sta	Length (ft)	Length (mi)	# of Stations	# TSP Intersect.
169+73	217+43	4770	0.90	3	7

FTA SCC Code	Description	Quantity	Unit	Unit Cost	Extension	Allocated Contingency	Total (2015\$)
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>					\$ 12,386,600	20%	\$ 13,723,900
1	10.01		RF	\$ -	\$ -	\$ -	\$ -
2	10.02		LF	\$ 25.00	\$ -	\$ -	\$ -
3	10.03	9,740	TF	\$ 100.00	\$ 974,000	\$ 194,800	\$ 1,168,800
4	10.04		RF	\$ 7,000.00	\$ -	\$ -	\$ -
5	10.04	1	LS	\$ 5,700,000.00	\$ 5,700,000	\$ -	\$ 5,700,000
6	10.09	300	TF	\$ 150.00	\$ 45,000	\$ 9,000	\$ 54,000
7	10.10	9,440	TF	\$ 415.00	\$ 3,917,600	\$ 783,500	\$ 4,701,100
8	10.11		TF	\$ 225.00	\$ -	\$ -	\$ -
9	10.12	2	EA	\$ 250,000.00	\$ 500,000	\$ 100,000	\$ 600,000
10	10.12	5	EA	\$ 250,000.00	\$ 1,250,000	\$ 250,000	\$ 1,500,000
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>					\$ 520,000	20%	\$ 624,000
11	20.01		EA	\$ 40,000.00	\$ -	\$ -	\$ -
12	20.01	2	EA	\$ 65,000.00	\$ 130,000	\$ 26,000	\$ 156,000
13	20.01	4	EA	\$ 90,000.00	\$ 360,000	\$ 72,000	\$ 432,000
14	20.01		EA	\$ 10,000.00	\$ -	\$ -	\$ -
15	20.01	1	LS	\$ 30,000.00	\$ 30,000	\$ 6,000	\$ 36,000
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>					\$ -	20%	\$ -
16	30.02		EA	\$ 5,000,000.00	\$ -	\$ -	\$ -
17	30.03		Per Bus	\$ 250,000.00	\$ -	\$ -	\$ -
18	30.05		EA	\$ 4,000,000.00	\$ -	\$ -	\$ -
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>					\$ 5,711,800	20%	\$ 6,854,100
19	40.01	5,410	CY	\$ 15.00	\$ 81,200	\$ 16,200	\$ 97,400
20	40.01	10,830	SY	\$ 3.00	\$ 32,500	\$ 6,500	\$ 39,000
21	40.01	1193	RF	\$ 50.00	\$ 59,600	\$ 11,900	\$ 71,500
22	40.01		EA	\$ 16,000.00	\$ -	\$ -	\$ -
23	40.01		EA	\$ 14,000.00	\$ -	\$ -	\$ -
24	40.01		EA	\$ 8,000.00	\$ -	\$ -	\$ -
25	40.01		EA	\$ 7,000.00	\$ -	\$ -	\$ -
26	40.01	4	EA	\$ 18,000.00	\$ 72,000	\$ 14,400	\$ 86,400
27	40.01	1	EA	\$ 17,000.00	\$ 17,000	\$ 3,400	\$ 20,400
28	40.01	1	EA	\$ 16,000.00	\$ 16,000	\$ 3,200	\$ 19,200
29	40.01		LS	\$ 42,000.00	\$ -	\$ -	\$ -
30	40.01		LS	\$ 275,000.00	\$ -	\$ -	\$ -
31	40.02	9,740	TF	\$ 300.00	\$ 2,922,000	\$ 584,400	\$ 3,506,400
32	40.02	6	EA	\$ 4,000.00	\$ 24,000	\$ 4,800	\$ 28,800
33	40.02		EA	\$ 21,000.00	\$ -	\$ -	\$ -
34	40.03	1	LS	\$ 120,000.00	\$ 120,000	\$ 24,000	\$ 144,000
35	40.05		SF	\$ 150.00	\$ -	\$ -	\$ -
36	40.06		EA	\$ 44,000.00	\$ -	\$ -	\$ -
37	40.06		EA	\$ 38,000.00	\$ -	\$ -	\$ -
38	40.06		EA	\$ 19,000.00	\$ -	\$ -	\$ -
39	40.06		EA	\$ 15,000.00	\$ -	\$ -	\$ -
40	40.06	4	EA	\$ 54,000.00	\$ 216,000	\$ 43,200	\$ 259,200
41	40.06	1	EA	\$ 50,000.00	\$ 50,000	\$ 10,000	\$ 60,000
42	40.06	1	EA	\$ 46,000.00	\$ 46,000	\$ 9,200	\$ 55,200
43	40.06	9,740	TF	\$ 20.00	\$ 194,800	\$ 39,000	\$ 233,800
44	40.06	28	EA	\$ 1,200.00	\$ 33,600	\$ 6,700	\$ 40,300
45	40.07		EA	\$ 28,000.00	\$ -	\$ -	\$ -
46	40.07		EA	\$ 24,000.00	\$ -	\$ -	\$ -
47	40.07		EA	\$ 22,000.00	\$ -	\$ -	\$ -
48	40.07		EA	\$ 17,000.00	\$ -	\$ -	\$ -
49	40.07	4	EA	\$ 34,000.00	\$ 136,000	\$ 27,200	\$ 163,200
50	40.07	1	EA	\$ 32,000.00	\$ 32,000	\$ 6,400	\$ 38,400
51	40.07	1	EA	\$ 29,000.00	\$ 29,000	\$ 5,800	\$ 34,800
52	40.07	4,970	RF	\$ 230	\$ 1,143,100	\$ 228,600	\$ 1,371,700
53	40.08	9,740	TF	\$ 50.00	\$ 487,000	\$ 97,400	\$ 584,400
<b>50 SYSTEMS</b>					\$ 6,930,700	20%	\$ 8,316,800
54	50.01		EA	\$ 500,000	\$ -	\$ -	\$ -
55	50.01	9,740	TF	\$ 30	\$ 292,200	\$ 58,400	\$ 350,600
56	50.02		EA	\$ 75,000	\$ -	\$ -	\$ -
57	50.02		EA	\$ 250,000	\$ -	\$ -	\$ -
58	50.02	7	EA	\$ 150,000	\$ 1,050,000	\$ 210,000	\$ 1,260,000
59	50.02	5	EA	\$ 15,000	\$ 75,000	\$ 15,000	\$ 90,000
60	50.02	2	EA	\$ 10,000	\$ 20,000	\$ 4,000	\$ 24,000
61	50.02		LS	\$ 100,000	\$ -	\$ -	\$ -
62	50.03	1	EA	\$ 1,500,000	\$ 1,500,000	\$ 300,000	\$ 1,800,000
63	50.04	2,385	RF	\$ 100	\$ 238,500	\$ 47,700	\$ 286,200
64	50.04	9,740	TF	\$ 250	\$ 2,435,000	\$ 487,000	\$ 2,922,000
65	50.05		LS	\$ 50,000	\$ -	\$ -	\$ -
66	50.05	6	EA	\$ 140,000	\$ 840,000	\$ 168,000	\$ 1,008,000

67	50.06	Fare Collection Allowance (per station)	6	EA	\$	80,000	\$	480,000	\$	96,000	\$	576,000
68	50.06	Fare Enforcement Equipment (per enforcement officer)		EA	\$	4,000	\$	-	\$	-	\$	-
69	50.07	Central Control Allowance (Two Workstations)		LS	\$	100,000	\$	-	\$	-	\$	-
<b>SUBTOTAL - INFRASTRUCTURE</b>							<b>Subtotal</b>	<b>\$ 25,549,100</b>			<b>\$ 29,518,800</b>	
<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>							\$	-	100%	\$	-	
70	60.01	Purchase or lease of real estate		AC	\$	-	\$	-	\$	-	\$	-
71	60.02	Relocation of existing households and businesses		AC	\$	-	\$	-	\$	-	\$	-
<b>70 VEHICLES</b>							\$	49,700	5%	\$	52,200	
72	70.05	Modern Streetcar		EA	\$	4,500,000.00	\$	-	\$	-	\$	-
73	70.06	Vehicles: Non-revenue Vehicle Allowance	4,970	RF	\$	10.00	\$	49,700	\$	2,500	\$	52,200
74	70.07	Vehicles: Spare Parts Allowance		EA	\$	100,000.00	\$	-	\$	-	\$	-

**West Broadway Transit Study**

Streetcar - North Loop Option 2 (One way couplet)

Estimate Basics

Start Sta	End Sta	Length (ft)	Length (mi)	# of Stations	# TSP Intersect.
169+73	216+72	4699	0.89	3	11
Couplet length		9130			

FTA SCC Code	Description	Quantity	Unit	Unit Cost	Extension	Allocated Contingency	Total (2015\$)
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>					\$ 12,632,300	20%	\$ 13,978,700
1	10.01		RF	\$ -	\$ -	\$ -	\$ -
2	10.02		LF	\$ 25.00	\$ -	\$ -	\$ -
3	10.03	9,330	TF	\$ 100.00	\$ 933,000	\$ 186,600	\$ 1,119,600
4	10.04		RF	\$ 7,000.00	\$ -	\$ -	\$ -
5	10.04	1	LS	\$ 4,000,000.00	\$ 4,000,000	\$ -	\$ 4,000,000
6	10.04	1	LS	\$ 1,900,000.00	\$ 1,900,000	\$ -	\$ 1,900,000
7	10.09	274	TF	\$ 150.00	\$ 41,100	\$ 8,200	\$ 49,300
8	10.10	9,056	TF	\$ 415.00	\$ 3,758,200	\$ 751,600	\$ 4,509,800
9	10.11		TF	\$ 225.00	\$ -	\$ -	\$ -
10	10.12	3	EA	\$ 250,000.00	\$ 750,000	\$ 150,000	\$ 900,000
11	10.12	5	EA	\$ 250,000.00	\$ 1,250,000	\$ 250,000	\$ 1,500,000
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>					\$ 520,000	20%	\$ 624,000
12	20.01		EA	\$ 40,000.00	\$ -	\$ -	\$ -
13	20.01	2	EA	\$ 65,000.00	\$ 130,000	\$ 26,000	\$ 156,000
14	20.01	4	EA	\$ 90,000.00	\$ 360,000	\$ 72,000	\$ 432,000
15	20.01		EA	\$ 10,000.00	\$ -	\$ -	\$ -
16	20.01	1	LS	\$ 30,000.00	\$ 30,000	\$ 6,000	\$ 36,000
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>					\$ -	20%	\$ -
17	30.02		EA	\$ 5,000,000.00	\$ -	\$ -	\$ -
18	30.03		Per Bus	\$ 250,000.00	\$ -	\$ -	\$ -
19	30.05		EA	\$ 4,000,000.00	\$ -	\$ -	\$ -
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>					\$ 6,519,000	20%	\$ 7,822,800
20	40.01	5,200	CY	\$ 15.00	\$ 78,000	\$ 15,600	\$ 93,600
21	40.01	10,400	SY	\$ 3.00	\$ 31,200	\$ 6,200	\$ 37,400
22	40.01		RF	\$ 50.00	\$ -	\$ -	\$ -
23	40.01		EA	\$ 16,000.00	\$ -	\$ -	\$ -
24	40.01		EA	\$ 14,000.00	\$ -	\$ -	\$ -
25	40.01		EA	\$ 8,000.00	\$ -	\$ -	\$ -
26	40.01		EA	\$ 7,000.00	\$ -	\$ -	\$ -
27	40.01	5	EA	\$ 18,000.00	\$ 90,000	\$ 18,000	\$ 108,000
28	40.01	1	EA	\$ 17,000.00	\$ 17,000	\$ 3,400	\$ 20,400
29	40.01		EA	\$ 16,000.00	\$ -	\$ -	\$ -
30	40.01		LS	\$ 42,000.00	\$ -	\$ -	\$ -
31	40.01		LS	\$ 275,000.00	\$ -	\$ -	\$ -
32	40.02	9,330	TF	\$ 300.00	\$ 2,799,000	\$ 559,800	\$ 3,358,800
33	40.02		EA	\$ 4,000.00	\$ -	\$ -	\$ -
34	40.02		EA	\$ 21,000.00	\$ -	\$ -	\$ -
35	40.03	1	LS	\$ 130,000.00	\$ 130,000	\$ 26,000	\$ 156,000
36	40.05		SF	\$ 150.00	\$ -	\$ -	\$ -
37	40.06		EA	\$ 44,000.00	\$ -	\$ -	\$ -
38	40.06		EA	\$ 38,000.00	\$ -	\$ -	\$ -
39	40.06		EA	\$ 19,000.00	\$ -	\$ -	\$ -
40	40.06		EA	\$ 15,000.00	\$ -	\$ -	\$ -
41	40.06	5	EA	\$ 54,000.00	\$ 270,000	\$ 54,000	\$ 324,000
42	40.06	1	EA	\$ 50,000.00	\$ 50,000	\$ 10,000	\$ 60,000
43	40.06		EA	\$ 46,000.00	\$ -	\$ -	\$ -
44	40.06	9,330	TF	\$ 20.00	\$ 186,600	\$ 37,300	\$ 223,900
45	40.06	44	EA	\$ 1,200.00	\$ 52,800	\$ 10,600	\$ 63,400
46	40.07		EA	\$ 28,000.00	\$ -	\$ -	\$ -
47	40.07		EA	\$ 24,000.00	\$ -	\$ -	\$ -
48	40.07		EA	\$ 22,000.00	\$ -	\$ -	\$ -
49	40.07		EA	\$ 17,000.00	\$ -	\$ -	\$ -
50	40.07	5	EA	\$ 34,000.00	\$ 170,000	\$ 34,000	\$ 204,000
51	40.07	1	EA	\$ 32,000.00	\$ 32,000	\$ 6,400	\$ 38,400
52	40.07		EA	\$ 29,000.00	\$ -	\$ -	\$ -
53	40.07	9,330	RF	\$ 230	\$ 2,145,900	\$ 429,200	\$ 2,575,100
54	40.08	9,330	TF	\$ 50.00	\$ 466,500	\$ 93,300	\$ 559,800
<b>50 SYSTEMS</b>					\$ 7,435,700	20%	\$ 8,922,900
55	50.01		EA	\$ 500,000	\$ -	\$ -	\$ -
56	50.01	9,330	TF	\$ 30	\$ 279,900	\$ 56,000	\$ 335,900
57	50.02		EA	\$ 75,000	\$ -	\$ -	\$ -
58	50.02		EA	\$ 250,000	\$ -	\$ -	\$ -
59	50.02	11	EA	\$ 150,000	\$ 1,650,000	\$ 330,000	\$ 1,980,000
60	50.02	3	EA	\$ 15,000	\$ 45,000	\$ 9,000	\$ 54,000
61	50.02	8	EA	\$ 10,000	\$ 80,000	\$ 16,000	\$ 96,000
62	50.02		LS	\$ 100,000	\$ -	\$ -	\$ -
63	50.03	1	EA	\$ 1,500,000	\$ 1,500,000	\$ 300,000	\$ 1,800,000
64	50.04	2,283	RF	\$ 100	\$ 228,300	\$ 45,700	\$ 274,000
65	50.04	9,330	TF	\$ 250	\$ 2,332,500	\$ 466,500	\$ 2,799,000
66	50.05		LS	\$ 50,000	\$ -	\$ -	\$ -

67	50.05	Station Communication/Electrical Allowance (Emergency Phone, Readerboards, Cameras)	6	EA	\$	140,000	\$	840,000	\$	168,000	\$	1,008,000
68	50.06	Fare Collection Allowance (per station)	6	EA	\$	80,000	\$	480,000	\$	96,000	\$	576,000
69	50.06	Fare Enforcement Equipment (per enforcement officer)		EA	\$	4,000	\$	-	\$	-	\$	-
70	50.07	Central Control Allowance (Two Workstations)		LS	\$	100,000	\$	-	\$	-	\$	-
<b>SUBTOTAL - INFRASTRUCTURE</b>							<b>Subtotal</b>	<b>\$ 27,107,000</b>			<b>\$ 31,348,400</b>	

<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>							\$	-	100%	\$	-	
71	60.01	Purchase or lease of real estate		AC	\$	-	\$	-	\$	-	\$	-
72	60.02	Relocation of existing households and businesses		AC	\$	-	\$	-	\$	-	\$	-
<b>70 VEHICLES</b>							\$	45,700	5%	\$	48,000	
73	70.05	Modern Streetcar		EA	\$	4,500,000.00	\$	-	\$	-	\$	-
74	70.06	Vehicles: Non-revenue Vehicle Allowance	4,565	RF	\$	10.00	\$	45,700	\$	2,300	\$	48,000
75	70.07	Vehicles: Spare Parts Allowance		EA	\$	100,000.00	\$	-	\$	-	\$	-

**West Broadway Transit Study**

Streetcar - Nicollet-Central Segment from Washington Ave. to 14th St.  
(Costs from Nicollet-Central team)

Estimate Basics

Start Sta	End Sta	Length (ft)	Length (mi)	# of Stations
216+72	270+32	5360	1.02	6

FTA SCC Code	Description	Quantity	Unit	Unit Cost	Extension	Allocated Contingency	Total (2015\$)
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>							
1	10.10	Embedded Track in Roadway	10,720	TF	\$ 420.00	\$ 4,502,400	\$ 5,177,800
					\$ 4,502,400	15%	\$ 675,400
					\$ 4,502,400		\$ 5,177,800
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>							
					\$ 1,000,000	20%	\$ 200,000
2	20.01	Modern Streetcar Stop on Nicollet Mall - Center Loading	1	EA	\$ 150,000.00	\$ 150,000	\$ 180,000
3	20.01	Modern Streetcar Stop on Nicollet Mall - Side Loading	10	EA	\$ 100,000.00	\$ 1,000,000	\$ 1,200,000
					\$ -	20%	\$ -
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>							
					\$ 5,242,000	30%	\$ 1,572,600
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>							
4	40.02	Utility Allowance	10,720	TF	\$ 250.00	\$ 2,680,000	\$ 3,484,000
5	40.02	Track drainage allowance	10,720	TF	\$ 25.00	\$ 268,000	\$ 348,400
6	40.02	Street lighting modification allowance	10,720	TF	\$ 25.00	\$ 268,000	\$ 348,400
7	40.06	Urban improvement & landscaping allowance	10,720	TF	\$ 25.00	\$ 268,000	\$ 348,400
8	40.06	ADA upgrade allowance per intersection	5	EA	\$ 30,000.00	\$ 150,000	\$ 195,000
9	40.07	Roadway construction allowance	10,720	TF	\$ 150.00	\$ 1,608,000	\$ 2,090,400
<b>50 SYSTEMS</b>							
					\$ 3,349,600	30%	\$ 1,004,880
10	50.02	Traffic Signal - Modify existing	12	EA	\$ 10,000	\$ 120,000	\$ 156,000
11	50.02	TSP Upgrade	10,720	TF	\$ 20	\$ 214,400	\$ 278,700
12	50.03	Traction power substation	1	EA	\$ 550,000	\$ 550,000	\$ 715,000
13	50.04	Traction power distribution allowance	10,720	TF	\$ 180	\$ 1,929,600	\$ 2,508,500
14	50.05	Fiber optic trunk allowance	5760	RF	\$ 40	\$ 230,400	\$ 299,500
15	50.06	Fare collection system and equipment	11	EA	\$ 18,000	\$ 198,000	\$ 257,400
16	50.07	Central control allowance	10,720	TF	\$ 10	\$ 107,200	\$ 139,400
<b>SUBTOTAL - INFRASTRUCTURE</b>					<b>Subtotal</b>	<b>\$ 14,094,000</b>	<b>\$ 17,546,900</b>
<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>							
					\$ -	100%	\$ -
<b>70 VEHICLES</b>							
					\$ -	5%	\$ -

**West Broadway Transit Study**

Streetcar - Nicollet-Central Segment from 2nd St. N to 14th St.  
(Costs from Nicollet-Central team)

Estimate Basics

Start Sta	End Sta	Length (ft)	Length (mi)	# of Stations
216+72	274+32	5760	1.09	6

FTA SCC Code	Description	Quantity	Unit	Unit Cost	Extension	Allocated Contingency	Total (2015\$)	
<b>10 GUIDEWAY &amp; TRACK ELEMENTS</b>					\$ 4,838,400	15%	\$ 5,564,200	
1	10.10	Embedded Track in Roadway	11,520	TF	\$ 420.00	\$ 4,838,400	\$ 725,800	\$ 5,564,200
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL</b>					\$ 1,000,000	20%	\$ 1,200,000	
2	20.01	Modern Streetcar Stop on Nicollet Mall - Center Loading	1	EA	\$ 150,000.00	\$ 150,000	\$ 30,000	\$ 180,000
3	20.01	Modern Streetcar Stop on Nicollet Mall - Side Loading	10	EA	\$ 100,000.00	\$ 1,000,000	\$ 200,000	\$ 1,200,000
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>					\$ -	20%	\$ -	
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>					\$ 5,622,000	30%	\$ 7,308,600	
4	40.02	Utility Allowance	11,520	TF	\$ 250.00	\$ 2,880,000	\$ 864,000	\$ 3,744,000
5	40.02	Track drainage allowance	11,520	TF	\$ 25.00	\$ 288,000	\$ 86,400	\$ 374,400
6	40.02	Street lighting modification allowance	11,520	TF	\$ 25.00	\$ 288,000	\$ 86,400	\$ 374,400
7	40.06	Urban improvement & landscaping allowance	11,520	TF	\$ 25.00	\$ 288,000	\$ 86,400	\$ 374,400
8	40.06	ADA upgrade allowance per intersection	5	EA	\$ 30,000.00	\$ 150,000	\$ 45,000	\$ 195,000
9	40.07	Roadway construction allowance	11,520	TF	\$ 150.00	\$ 1,728,000	\$ 518,400	\$ 2,246,400
<b>50 SYSTEMS</b>					\$ 3,517,600	30%	\$ 4,572,900	
10	50.02	Traffic Signal - Modify existing	12	EA	\$ 10,000	\$ 120,000	\$ 36,000	\$ 156,000
11	50.02	TSP Upgrade	11,520	TF	\$ 20	\$ 230,400	\$ 69,100	\$ 299,500
12	50.03	Traction power substation	1	EA	\$ 550,000	\$ 550,000	\$ 165,000	\$ 715,000
13	50.04	Traction power distribution allowance	11,520	TF	\$ 180	\$ 2,073,600	\$ 622,100	\$ 2,695,700
14	50.05	Fiber optic trunk allowance	5760	RF	\$ 40	\$ 230,400	\$ 69,100	\$ 299,500
15	50.06	Fare collection system and equipment	11	EA	\$ 18,000	\$ 198,000	\$ 59,400	\$ 257,400
16	50.07	Central control allowance	11,520	TF	\$ 10	\$ 115,200	\$ 34,600	\$ 149,800
<b>SUBTOTAL - INFRASTRUCTURE</b>					<b>Subtotal</b>	<b>\$ 14,978,000</b>		<b>\$ 18,645,700</b>
<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>					\$ -	100%	\$ -	
<b>70 VEHICLES</b>					\$ -	5%	\$ -	