

August 2016

Cost Estimation Technical Memorandum

RED ROCK
SOUTHEAST CORRIDOR

Your Ticket to the Southeast Metro.

PREPARED FOR

Red Rock Corridor Commission

PREPARED BY

Kimley»Horn

PARSONS BRINCKERHOFF

Contents

Introduction 1
Capital Costs 2
Capital Cost Methodology 2
Standard Cost Category Clarifications 3
Category 10: Guideway and Track Elements 3
Category 20: Stations, Stops, Terminals, Intermodal 3
Category 30: Support Facilities: Yards, Shops, Administration Buildings 4
Category 40: Sitework and Special Conditions 4
Category 50: Systems 5
Category 60: Right-of-way, Land Costs, and Existing Improvements 5
Category 70: Vehicles 5
Category 80: Professional Services 5
Category 90: Unallocated Contingency 6
Category 100: Finance Charges 6
Capital Costs by Station 7
Gold Line BRT Guideway Connection 7
Lower Afton Park & Ride 8
Newport Transit Station 9
St. Paul Park Station 9
80th Street Station 10
2nd Cottage Grove Station 11
Langdon Village Station 12
Hastings Depot Station 13
Hastings #2 Station 13
Hastings #3 Station 14
Corridor Capital Costs 14
Vehicles and Maintenance Facility Costs 15
Summary of Capital Cost Estimates 15
Operations and Maintenance Costs 16
Introduction 16
Cost Drivers 16
Cost Calculation 17
O&M Cost Discussion 20

Appendix A: Capital Costs by Alternative..... A-1
Appendix B: METRO Gold Line Guideway Connection Design Concepts B-1

Introduction

The Red Rock Corridor is a proposed 30-mile transitway, connecting the Twin Cities' southeastern suburbs to downtown Saint Paul. **Figure 1** shows the general study area for this project. Previous studies have assessed the feasibility of transit service between Minneapolis and Red Wing, but BRT service would be between Saint Paul and Hastings for the purposes of this Implementation Plan. The corridor has national, statewide, and regional significance as a transportation route for automobile, truck, freight, and passenger rail travel.

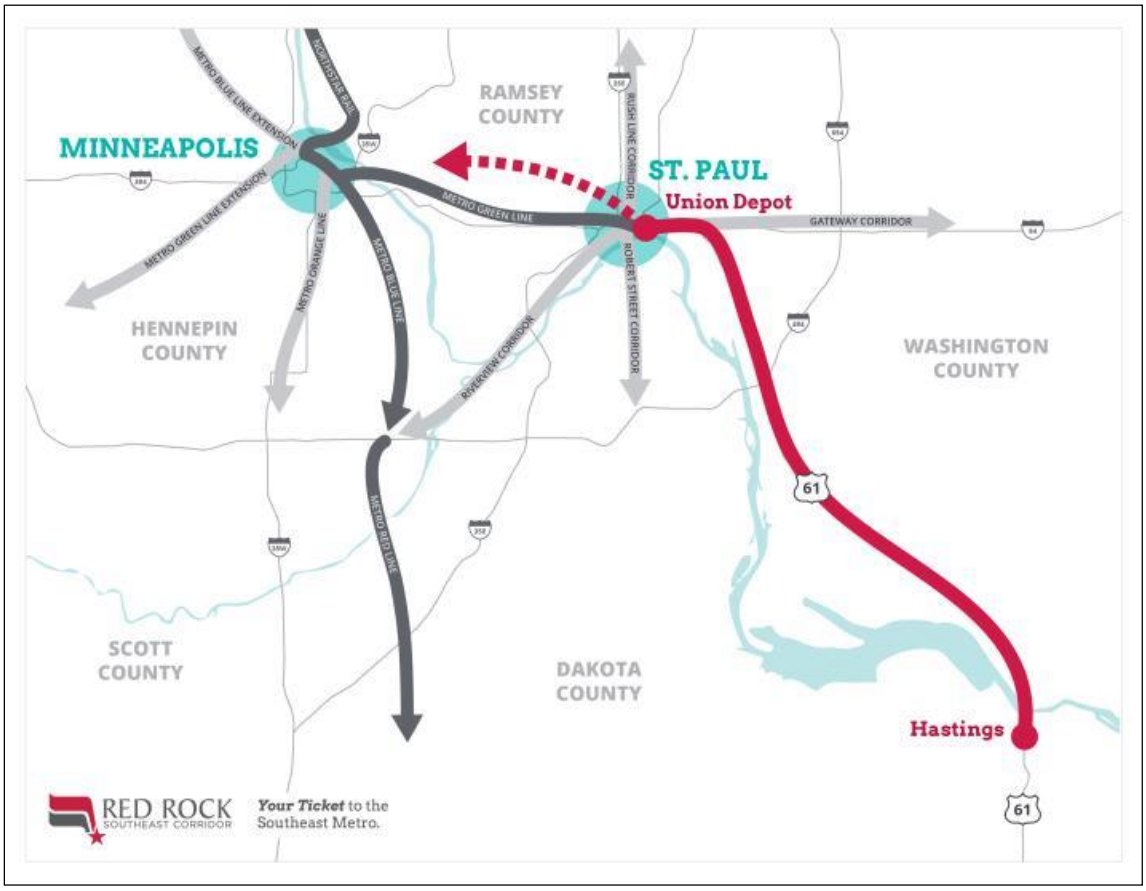


Figure 1: Project Study Area

A single BRT alternative was analyzed as part of the Red Rock Alternatives Analysis Update (AAU). As part of the Implementation Plan process, however, commuter rail was not advanced for further analysis, and the Red Rock Corridor Commission (RRCC) recommended exploring additional BRT alignments within the BRT corridor. For the Implementation Plan, three build alternatives were analyzed in the Red Rock Corridor from Hastings to the Union Depot in St. Paul. These are described as follows:

- **Alternative 1:** BRT with stops at the Union Depot, Lower Afton Park & Ride, Newport Transit Station, 70th Street Station, Langdon Village Station, and the Hastings Depot. Parking is assumed at all stations, with the exception of the 70th Street Station. This is the alternative that resulted from the AAU.
- **Alternative 2A:** BRT via 95th Street with stops at the Union Depot, Mounds Boulevard Station, Earl Street Station, Etna Street Station, Lower Afton Park & Ride, Newport Transit Station, St. Paul Park Station, 80th Street Station, 95th Street Station, the Hastings Depot, Lions Park Station, and the Dakota County Offices Station. The Mounds Boulevard, Earl Street, and Etna Street Stations are shared with the Gateway Corridor and utilize the transit-only guideway being developed for that corridor.

- **Alternative 2B:** BRT via Jamaica Avenue with the same stops as Alternative 2A with two modifications: elimination of the 95th Street Station and alternative routing along the east side of Highway 61 in Cottage Grove to serve a station at Jamaica Avenue.

The purpose of this report is to define and document the methods used to estimate both capital costs and operations and maintenance (O&M) costs associated with the primary alternatives for the Red Rock Implementation Plan.

The costs presented in this Implementation Plan include a number of revised assumptions from those presented in the Alternatives Analysis Update (AAU). Some of the key cost differences between the AAU and this Implementation Plan include:

- O&M Facility: The Implementation Plan includes capital costs associated with sharing the constructions costs of a new BRT maintenance facility (expressed as a constant cost per new bus purchased).
- Gateway Connection: The Implementation Plan includes a capital cost estimate to connect the Red Rock and Gateway Corridors.
- Station Area Costs: The AAU included extensive site redesign and pedestrian overpasses at the Lower Afton and Cottage Grove stations. This Implementation Plan assumes additional stations but minimal station area costs, primarily related to the construction of a BRT platform, with no pedestrian structures or structured parking.

Just as costs shifted between the AAU and this Implementation Plan, the total cost of the Red Rock Corridor is likely to continue to change as more detailed assumptions are developed. As additional information is determined in later phases, specific known project costs may increase while contingencies to account for unknown costs will decrease. This report summarizes the assumptions that were used to develop the capital and O&M costs for the Red Rock Corridor Implementation Plan. The numbers presented in this Technical Memo represent the final Implementation Plan cost estimates that are included in the Final Report and in some cases differ from interim costs presented to the public during the development of the Implementation Plan.

Capital Costs

Capital Cost Methodology

What is included in Capital costs

Capital cost estimates include the one-time expenditure to build the system and typically include corridor improvements, stations, structures, signalization and communications systems, operations and maintenance facilities, vehicles, and right-of-way (ROW) acquisition. Also included are “soft costs” for items such as engineering, construction services, insurance, and owner’s costs, as well as contingencies for uncertainty in both the estimating process and the scope of the project.

Planning-Level Estimates

At this early study stage, there is not sufficient definition or detail to prepare detailed construction cost estimates for the alternatives under consideration. Rather, the capital cost estimates were developed using representative typical unit costs or allowances on a per-unit basis that is consistent with this level of review. Prior to implementation, the capital cost estimates will need to be refined based upon additional design development work.

The unit costs used in this capital cost estimate are derived from the Arterial Transitway Corridor Study (ATCS) and the Highway Transitway Corridor Study (HTCS), with some unit costs updated to match known A Line figures. These unit costs are then categorized into FTA’s Standard Cost Categories (SCC) for each station. Corridor-level costs by alternative (such as transit signal priority and shoulder improvements) are also categorized into FTA’s Standard Cost Categories (SCC). Each alternative’s total cost is the summation of the individual station costs and corridor improvement costs in that alternative.

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 Red Rock Corridor Implementation Plan capital cost estimates are based upon the following parameters:

- Base Year – Year 2015 is used as the base year for definition of the unit prices and development of the capital cost estimates.
- Unit Prices – Base year unit prices for the various capital cost elements were developed using several references and resources that are similar to the proposed work, including the ATCS, HTCS, the A Line, the West Broadway Transit Study, and the Robert Street Corridor Study.
- Unallocated Contingency – An unallocated contingency of 25%, similar to the West Broadway Transit Study, is included in the capital cost estimates. This contingency is applied to the total estimated capital cost for each alternative, and is in addition to any specific estimating contingencies that are added to the various cost categories.
- 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 allocated contingency assumptions to be included in the capital cost were taken from the West Broadway Transit Study:
  - Category 10, 20, 30, 40, 50 20%
  - Category 60 100%
  - Category 70 5%

Standard Cost Category Clarifications

CATEGORY 10: GUIDEWAY AND TRACK ELEMENTS

New Ramp Connections

This item includes civil site improvements such as slip ramps or new roadways to better connect the corridor or improve circulation. These costs are all station specific.

Transit Signal Priority (TSP) Improvements

The addition of transit signal priority (TSP) has been assumed for all existing traffic signals along the corridor. Because these costs are not station specific the costs are applied at the corridor level and vary by alternative. Further study of the application of TSP to the corridor will need to be completed in future design phases.

Shoulder Improvements

The "Congested Principal Arterials 2040" map in the 2040 TPP indicates that US-61 to Hastings will be congested by 2040. In order to maintain travel times despite this congestion, buses are assumed to operate on US-61 shoulders. The existing shoulders between Interstate 94 and 70th Street will only require minor modifications because they are wide enough to accommodate BRT vehicles today. However, the length of US-61 between 70th Street and Hastings requires full shoulder reconstruction. None of these improvement costs between Interstate 94 and Hastings along US-61 are associated with one station; instead the costs are included in the Corridor Improvement capital costs for each alternative.

CATEGORY 20: STATIONS, STOPS, TERMINALS, INTERMODAL

Category 20 costs include the station shelter itself and the costs associated with platform construction.

Shelters

Station shelters are assumed to be enclosed structures with on-demand heating and include an additional covered waiting area. Shelters would have a recognizable branding style for the BRT corridor. Shelter costs include the installation of two trash receptacles, two bike racks, and a park-style bench. Depending on the station location and surrounding roadway environment, a larger or smaller shelter was estimated.

Station Platforms

Station platforms are assumed to be 80-feet long and 12-feet wide, constructed of special concrete pavement. Platforms are 9-inches high to accommodate near-level boarding. The design also assumes a 2-foot wide detectable warning strip for the entire

length of the platform. The following provides a summary of the assumptions used to develop unit costs for this component of the BRT station cost:

- Station platforms are located at existing park-and-ride locations or near existing sidewalks.
- Costs for the station platform assume modifications of the existing roadway to accommodate the station platforms. Some specific stations require removal of curb and gutter, and traffic control infrastructure. See the "Station Roadway Improvements" section in Category 40 for more information on these modifications.
- Assumes some existing sidewalk reconstruction.
- Station signage (two signs per platform).
- Assumes other miscellaneous removals.

CATEGORY 30: SUPPORT FACILITIES: YARDS, SHOPS, ADMINISTRATION BUILDINGS

Category 30 includes BRT maintenance facility costs. The requirements for BRT support facilities are dependent on the type of vehicle, the size of the fleet, and the system maintenance needs. It is currently unclear whether entirely new facilities would be needed to support the BRT corridor, or whether existing Metro Transit facilities could be modified and expanded to meet the need. For this estimate, a capital cost was included on a per bus basis for a new maintenance facility, or modifications to an existing bus facility. These costs are not station specific and are therefore included in Corridor Improvement costs by alternative.

CATEGORY 40: SITEWORK AND SPECIAL CONDITIONS

Category 40 includes roadway improvements, park-and-ride improvements, utilities and drainage, pedestrian improvements, and traffic control.

Station Roadway Improvements

This includes reconstruction of the roadway at the station location and additional roadway pavement needed to accommodate the station. The following provides a summary of the assumptions used for these improvements:

- New bituminous pavement is provided to widen the roadway to accommodate the station platform and any other lane reconfiguration.
- A concrete pavement slab is provided for the entire length of the platform to accommodate bus movements.
- Concrete sidewalk and pedestrian improvements to connect the station to the existing sidewalks.
- Landscaping improvements, including restoration of grass and minimal trees/shrubbery at the station.

Park-and-Ride Improvements

This assumes new surface park-and-ride lots, or the expansion of existing facilities for the anticipated ridership growth for the Red Rock Corridor. Parking quantities were calculated based on projected boardings from ridership based on park-and-ride access. A cost of $4,000 per required parking stall was used for the park-and-rides, which includes the costs for pavement and other site improvements. The $4,000 cost per parking stall is derived from the HTCS. The number of parking stalls assumed at each station varies based on parking demand for each alternative as well as spare parking capacity.

Utility and Drainage Improvements

Utility and drainage improvements are categorized as either a major or minor improvement and were based on the existing above ground utilities that were located at each station site. Major utility and drainage improvements assume that multiple utilities will need to be relocated as part of the station construction, including fire hydrants, water mains, and catch basins. Minor utility and drainage improvements assume that only one or two utilities require relocation as part of the station construction.

This cost estimate assumes that existing power poles will not require relocation as part of the station construction.

Pedestrian Improvements

Additional pedestrian improvements costs are categorized as either a major or minor improvement based on the existing pedestrian facilities near the proposed stations. These costs assume the removal and/or construction of concrete sidewalks and pedestrian ramps to/from the station areas. Pedestrian improvements were assumed for Lower Afton and Langdon Village due to a lack of

existing pedestrian infrastructure. Additional itemized pedestrian improvements were also assumed for St. Paul Park in order to connect the station to the downtown area.

Traffic Control

Traffic control costs are categorized based on the station platform location and type and have different costs associated with each type. Inline, highway, and arterial BRT stations will require different traffic control measures, with highway stations likely having the most significant impact and cost during construction.

CATEGORY 50: SYSTEMS

Category 50 includes the purchase of electrical systems, such as pedestrian traffic signals and platform system equipment.

Platform Systems Allowance

The platform systems allowance costs include equipment for the various off-board fare collection, security, and electrical/communications systems on the station platform. The following items are included in the cost:

- Two smaller-scale ticket vending machines, similar to those used on the A Line
- One Go-To Card validator
- One emergency phone and security camera (assumes DVR-recorded, remotely downloadable cameras)
- One real-time sign
- Wireless communication connection, ITS network, and system components
- Electrical service connection

CATEGORY 60: RIGHT-OF-WAY, LAND COSTS, AND EXISTING IMPROVEMENTS

It is anticipated that costs associated with the acquisition of ROW needed for construction and operation of the project will be limited to locations where station platforms do not fit within the existing ROW limits. These costs are station specific. At this level of analysis, it was assumed that no additional ROW will be required to accommodate the proposed BRT stations and corridor improvements, except at the Langdon Village Station and the southbound 80th Street Station. ROW assumptions will need to be refined based upon additional information and design development work that occurs.

CATEGORY 70: VEHICLES

Quantities for BRT vehicles were based on the operating service levels that were developed as part of the operating plan for the corridor. Vehicle quantities include those needed as part of the service plan and spares. Actual capital costs for vehicle types were based on the following:

- Low floor 40-foot BRT buses
- Two on-board validators per vehicle

Separate costs for video screens/ electronic stop displays and annunciator equipment will not be included as part of this estimate, but are assumed to be included as part of the overall bus costs.

CATEGORY 80: PROFESSIONAL SERVICES

Soft costs in Category 80 include 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 and public art. These costs were generated by applying assumed rates to different categories of the estimate. The following table identifies the professional services assumptions that were incorporated into the capital cost estimates.

Table 1: Professional Service Assumptions Incorporated into Capital Cost Estimates

PROFESSIONAL SERVICE	CONSTRUCTION	RIGHT-OF-WAY	VEHICLES
Preliminary Engineering	4%	-	-
Final Design	6%	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%
Public Art	1%	-	-
Total	**34%**	**30%**	**6%**

CATEGORY 90: UNALLOCATED CONTINGENCY

A 25% unallocated contingency is applied on top of the unit estimates.

CATEGORY 100: FINANCE CHARGES

There are no finance charges assumed in this project.

Capital Costs by Station

GOLD LINE BRT GUIDEWAY CONNECTION

Alternative 2 is assumed to connect to the planned Gold Line (Gateway) Corridor at Highway 61 and I-94. A preliminary design concept was developed that allows the Red Rock Corridor to access the Etna Street Station on the dedicated Gold Line guideway. This concept utilizes an on-ramp and off-ramp accessible only by buses and the planned roundabout at the intersection of Highway 61 and Wilson Avenue. This connection also includes the realignment of the westbound off-ramp from I-94. For Alternatives 2A and 2B, civil site improvements to connect TH 61 with the proposed METRO Gold Line BRT guideway were also included in the estimates

Station improvement costs at the METRO Gold Line station areas are not included as part of the Red Rock Implementation Plan. It is assumed that Red Rock BRT service will be able to utilize existing infrastructure at Gold Line stations without needing additional improvements.

Capital costs for this connection to the Gateway Corridor are shown in **Table 2**, and a conceptual design of the METRO Gold Line guideway connection is shown in **Appendix B.**

Table 2: Gold Line Connection Capital Costs by FTA Standard Cost Category

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	N/A	$550,800	$550,800
20	Stations, Stops, Terminals, Intermodal	N/A	$0	$0
30	Support Facilities: Yards, Shops, Admin. Buildings	N/A	$2,617,600	$2,617,600
40	Sitework & Special Conditions	N/A	$21,600	$21,600
50	Systems	N/A	$0	$0
60	ROW, Land, Existing Improvements	N/A	$0	$0
70	Vehicles	N/A	$0	$0
80	Professional Services	N/A	$908,000	$908,000
90	Unallocated Contingency	N/A	$1,025,000	$1,025,000
100	Finance Charges	N/A	$0	$0
	Total Capital Costs	**N/A**	**$5,123,000**	**$5,123,000**

LOWER AFTON PARK & RIDE

The existing 114-stall park-and-ride facility is located on the south side of Lower Afton Road. Due to capacity constraints, potential access and safety issues with the current facility, and neighborhood concerns, the Alternatives Analysis Update considered relocating the park-and-ride to the north side of Lower Afton Road. The facility was also assumed to have structured parking and a pedestrian overpass.

Because the future of the park-and-ride itself is uncertain, the only capital costs assumed in each alternative are improved BRT platforms with larger shelters at the locations of the existing boarding areas. The ongoing discussions between Washington County, the City of Saint Paul, MnDOT, and Metro Transit to decide a transit solution at this site could impact this cost estimate. However, in order to accommodate the projected ridership numbers (from an unconstrained model), Alternative 1 would require the addition of 90 parking stalls, and Alternatives 2A and 2B would require the addition of 80 parking stalls. These parking stall costs are not included in the capital costs estimates because of uncertainty at this station (**Table 3**).

Table 3: Lower Afton Station Capital Costs by FTA Standard Cost Category

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$0	$0	$0
20	Stations, Stops, Terminals, Intermodal	$461,000	$461,000	$461,000
30	Support Facilities: Yards, Shops, Admin. Buildings	$0	$0	$0
40	Sitework & Special Conditions	$286,000	$286,000	$286,000
50	Systems	$528,000	$528,000	$528,000
60	ROW, Land, Existing Improvements	$0	$0	$0
70	Vehicles	$0	$0	$0
80	Professional Services	$363,000	$363,000	$363,000
90	Unallocated Contingency	$410,000	$410,000	$410,000
100	Finance Charges	$0	$0	$0
	Total Capital Costs	**$2,048,000**	**$2,048,000**	**$2,048,000**

NEWPORT TRANSIT STATION

The recently opened transit station includes 150 parking stalls and a turnaround for buses off of Maxwell Avenue. The existing parking is currently not fully utilized, and it is assumed that 100 existing parking stalls can be used for BRT ridership. To accommodate ridership demands, the Newport Transit Station requires the addition of 50 parking stalls to the existing facility in Alternative 1 and 40 parking stalls to the existing facility in Alternatives 2A and 2B. This difference in parking needs is the only difference in capital costs between the alternatives (**Table 4**).

All alternatives assume BRT infrastructure enhancements at the existing transit station, including fare collection equipment and real-time signage. No platform modifications are assumed for any alternative at the Newport Transit Station.

Table 4: Newport Transit Station Capital Costs by FTA Cost Category

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$0	$0	$0
20	Stations, Stops, Terminals, Intermodal	$152,000	$152,000	$152,000
30	Support Facilities: Yards, Shops, Admin. Buildings	$0	$0	$0
40	Sitework & Special Conditions	$395,000	$347,000	$347,000
50	Systems	$264,000	$264,000	$264,000
60	ROW, Land, Existing Improvements	$0	$0	$0
70	Vehicles	$0	$0	$0
80	Professional Services	$233,000	$217,000	$217,000
90	Unallocated Contingency	$261,000	$245,000	$245,000
100	Finance Charges	$0	$0	$0
	Total Capital Costs	**$1,305,000**	**$1,225,000**	**$1,225,000**

ST. PAUL PARK STATION

This station is assumed to be located on Broadway Avenue near the intersection with Summit Avenue in St. Paul Park. The existing ROW on Broadway Avenue is sufficient to construct station platforms for this walk-up station. Additional pedestrian improvements are also assumed to connect the station to the downtown core immediately west of the freight rail crossing on Broadway Avenue.

Table 5: St. Paul Park Station Capital Costs by FTA Cost Category

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$0	$0	$0
20	Stations, Stops, Terminals, Intermodal	$305,000	$305,000	$305,000
30	Support Facilities: Yards, Shops, Admin. Buildings	$0	$0	$0
40	Sitework & Special Conditions	$370,000	$370,000	$370,000
50	Systems	$528,000	$528,000	$528,000
60	ROW, Land, Existing Improvements	$0	$0	$0
70	Vehicles	$0	$0	$0
80	Professional Services	$342,000	$342,000	$342,000
90	Unallocated Contingency	$387,000	$387,000	$387,000
100	Finance Charges	$0	$0	$0
	Total Capital Costs	**$1,932,000**	**$1,932,000**	**$1,932,000**

80TH STREET STATION

Alternative 2 includes a walk-up station at 80th Street. The 80th Street Station in Alternative 2A is located on the west side of US-61 at the intersection of 80th Street and Hadley Avenue. In addition to two arterial shelters and platforms, the capital costs for this location include some ROW acquisition. The 80th Street Station in Alternative 2B is located on the east side of US-61 along East Point Douglas Road. Alternative 2B does not need any ROW acquisition. It includes station platforms, shelters, and minor utility and drainage work in the capital costs.

Table 6: 80th Street Station Capital Costs by FTA Standard Cost Category

STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10 Guideway & Track Elements	N/A	$0	$0
20 Stations, Stops, Terminals, Intermodal	N/A	$305,000	$305,000
30 Support Facilities: Yards, Shops, Admin. Buildings	N/A	$0	$0
40 Sitework & Special Conditions	N/A	$280,000	$280,000
50 Systems	N/A	$528,000	$528,000
60 ROW, Land, Existing Improvements	N/A	$88,000	$0
70 Vehicles	N/A	$0	$0
80 Professional Services	N/A	$330,000	$318,000
90 Unallocated Contingency	N/A	$383,000	$358,000
100 Finance Charges	N/A	$0	$0
Total Capital Costs	**N/A**	**$1,914,000**	**$1,789,000**

2ND COTTAGE GROVE STATION

Alternative 2 includes a second station in Cottage Grove. Alignment 2A on the west side of US-61 stops at a 95th Street Station. Alignment 2B on the east side of US-61 stops at a Jamaica Avenue Station.

Alignment 2A: 95th Street Station

This station is located on 95th Street near Hemingway Avenue South. Existing ROW is adequate for placement of the curbside station platforms. This intersection does not currently have a pedestrian crossing on 95th Street, and the capital cost estimate assumes the addition of a signalized pedestrian crossing and ADA ramp improvements at this location.

Alignment 2B: Jamaica Avenue Station

This station is assumed to be located on East Point Douglas Road immediately north of Jamaica Avenue within existing road ROW. In addition to the typical station shelter and platform construction costs, this station's capital costs include:

- 84 parking stalls in order to accommodate the parking demand projected in the ridership model
- Pavement removal and roadway realignment and reconstruction in order to reconfigure parking and transit operations

Table 7: 95th Street Station/Jamaica Avenue Station Capital Costs by FTA Standard Cost Category

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	N/A	$0	$0
20	Stations, Stops, Terminals, Intermodal	N/A	$305,000	$305,000
30	Support Facilities: Yards, Shops, Admin. Buildings	N/A	$0	$0
40	Sitework & Special Conditions	N/A	$280,000	$1,196,000
50	Systems	N/A	$618,000	$528,000
60	ROW, Land, Existing Improvements	N/A	$0	$0
70	Vehicles	N/A	$0	$0
80	Professional Services	N/A	$342,000	$578,000
90	Unallocated Contingency	N/A	$387,000	$652,000
100	Finance Charges	N/A	$0	$0
	Total Capital Costs	**N/A**	**$1,932,000**	**$3,259,000**

LANGDON VILLAGE STATION

The Langdon Village Station, which is only assumed in Alternative 1, consists of a park-and-ride with 30 parking stalls, split boarding platforms for northbound and southbound buses, and an internal bus turnaround for northbound buses. Northbound buses are assumed to use Jamaica Avenue to access the station, and will return on Point Douglas Road to Jamaica Avenue in order to return to Highway 61. Southbound buses will utilize a new bus only slip ramp from Point Douglas Road in order to reduce the travel time for buses.

This station will be located within planned redevelopment that will include mixed-use and residential uses. One acre of ROW acquisition has been assumed in the capital costs for this park-and-ride station.

Table 8: Langdon Village Capital Cost Estimate

SCC	DESCRIPTION	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$ 108,000	N/A	N/A
20	Stations, Stops, Terminals, Intermodal	$ 350,000	N/A	N/A
30	Support Facilities: Yards, Shops, Admin. Buildings	$ 0	N/A	N/A
40	Sitework & Special Conditions	$ 210,000	N/A	N/A
50	Systems	$ 264,000	N/A	N/A
60	ROW, Land, Existing Improvements	$ 264,000	N/A	N/A
70	Vehicles	$ -	N/A	N/A
80	Professional Services	$ 304,000	N/A	N/A
90	Unallocated Contingency	$ 375,000	N/A	N/A
100	Finance Charges	$ -	N/A	N/A
	Total Capital Costs	**$ 1,875,000**	**N/A**	**N/A**

HASTINGS DEPOT STATION

The Hastings Depot station is located at the city-owned existing parking facility near the renovated train depot at Tyler Street and 2nd Street East in Hastings. Because the city owns the parcel on which the park-and-ride and Hastings Depot are located, there is no assumed ROW cost for station placement. A BRT station platform with an enhanced shelter is included in the capital cost estimate. It is assumed that the existing parking is sufficient to meet the parking demands for BRT service, and a shared use agreement will allow riders to use the municipal lot as a transit park-and-ride. The Hastings Depot Station is the terminus station for Alternative 1; it is assumed that drivers will have the ability to use the existing facilities that the Central Pacific employees use at the depot (or nearby businesses) during layovers.

Table 9: Hastings Depot Station Capital Cost by FTA Standard Cost Category

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$0	$0	$0
20	Stations, Stops, Terminals, Intermodal	$230,000	$230,000	$230,000
30	Support Facilities: Yards, Shops, Admin. Buildings	$0	$0	$0
40	Sitework & Special Conditions	$155,000	$155,000	$155,000
50	Systems	$264,000	$264,000	$264,000
60	ROW, Land, Existing Improvements	$0	$0	$0
70	Vehicles	$0	$0	$0
80	Professional Services	$184,000	$184,000	$184,000
90	Unallocated Contingency	$209,000	$209,000	$209,000
100	Finance Charges	$0	$0	$0
	Total Capital Costs	**$1,042,000**	**$1,042,000**	**$1,042,000**

HASTINGS #2 STATION

This station is assumed to be located on Highway 55 near the intersection of Pine Street within existing road ROW. The exact station location was not determined. Existing pedestrian facilities would likely not require significant improvements.

Table 10: Hastings #2 Station Capital Costs by FTA Standard Cost Categories

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	N/A	$0	$0
20	Stations, Stops, Terminals, Intermodal	N/A	$305,000	$305,000
30	Support Facilities: Yards, Shops, Admin. Buildings	N/A	$0	$0
40	Sitework & Special Conditions	N/A	$318,000	$318,000
50	Systems	N/A	$528,000	$528,000
60	ROW, Land, Existing Improvements	N/A	$0	$0
70	Vehicles	N/A	$0	$0
80	Professional Services	N/A	$329,000	$329,000
90	Unallocated Contingency	N/A	$370,000	$370,000
100	Finance Charges	N/A	$0	$0
	Total Capital Costs	**N/A**	**$1,850,000**	**$1,850,000**

HASTINGS #3 STATION

The terminus station for Alternative 2 is located at the existing Dakota County Offices. It is assumed that buses will utilize the existing drive aisle and parking area for turnaround and layover. A BRT station platform with an enhanced shelter is included in the capital cost estimate. It is assumed that a shared use agreement will allow for a limited number of park-and-ride users to use the existing county offices parking lot. Driver layover facilities are not included in the estimate, as it is assumed that the existing facilities in the county offices will be used by drivers.

Table 11: Hastings #3 Capital Costs by FTA Standard Cost Category

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	N/A	$0	$0
20	Stations, Stops, Terminals, Intermodal	N/A	$152,000	$152,000
30	Support Facilities: Yards, Shops, Admin. Buildings	N/A	$0	$0
40	Sitework & Special Conditions	N/A	$155,000	$155,000
50	Systems	N/A	$264,000	$264,000
60	ROW, Land, Existing Improvements	N/A	$0	$0
70	Vehicles	N/A	$0	$0
80	Professional Services	N/A	$165,000	$165,000
90	Unallocated Contingency	N/A	$184,000	$184,000
100	Finance Charges	N/A	$0	$0
	Total Capital Costs	**N/A**	**$920,000**	**$920,000**

Corridor Capital Costs

Transit signal priority and shoulder improvements are corridor costs that are unspecific to one station. These capital costs are shown by alternative in **Table 12** and vary according to the number of intersections that alternative passes through.

Table 12: Corridor Capital Costs by FTA Standard Cost Categories

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$3,577,000	$3,004,000	$3,040,000
20	Stations, Stops, Terminals, Intermodal	$0	$0	$0
30	Support Facilities: Yards, Shops, Admin. Buildings	$0	$0	$0
40	Sitework & Special Conditions	$0	$0	$0
50	Systems	$0	$0	$0
60	ROW, Land, Existing Improvements	$0	$0	$0
70	Vehicles	$0	$0	$0
80	Professional Services	$75,000	$1,010,000	$1,020,000
90	Unallocated Contingency	$913,000	$1,004,000	$1,015,000
100	Finance Charges	$0	$0	$0
	Total Capital Costs	**$4,565,000**	**$5,018,000**	**$5,075,000**

Vehicles and Maintenance Facility Costs

Vehicles and costs to construct an operation and maintenance facility by alternative are shown in **Table 13**. Nine (9) vehicles are assumed for Alternative 1 and twelve (12) vehicles are assumed for Alternative 2A and 2B.

Table 13: Vehicles and Maintenance Facility Capital Costs by FTA Standard Cost Categories

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$0	$0	$0
20	Stations, Stops, Terminals, Intermodal	$0	$0	$0
30	Support Facilities: Yards, Shops, Admin. Buildings	$5,400,000	$7,200,000	$7,200,000
40	Sitework & Special Conditions	$0	$0	$0
50	Systems	$0	$0	$0
60	ROW, Land, Existing Improvements	$0	$0	$0
70	Vehicles	$4,801,000	$6,401,000	$6,401,000
80	Professional Services	$1,813,000	$2,418,000	$2,418,000
90	Unallocated Contingency	$3,004,000	$4,005,000	$4,005,000
100	Finance Charges	$0	$0	$0
	Total Capital Costs	**$15,018,000**	**$20,024,000**	**$20,024,000**

Summary of Capital Cost Estimates

A summary of capital costs by alignment alternative is shown in **Table 14**.

Table 14: Total Capital Costs by Alternative

	STANDARD COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
10	Guideway & Track Elements	$3,685,000	$3,555,000	$3,590,800
20	Stations, Stops, Terminals, Intermodal	$1,378,000	$2,215,000	$2,215,000
30	Support Facilities: Yards, Shops, Admin. Buildings	$5,400,000	$7,200,000	$7,200,000
40	Sitework & Special Conditions	$1,536,000	$4,808,000	$5,724,600
50	Systems	$1,848,000	$3,543,000	$3,453,600
60	ROW, Land, Existing Improvements	$264,000	$88,000	$0
70	Vehicles	$4,801,000	$6,401,000	$6,401,000
80	Professional Services	$3,314,000	$6,608,000	$6,842,000
90	Unallocated Contingency	$5,559,000	$8,610,000	$8,860,000
100	Finance Charges	$0	$0	$0
	Total Capital Costs	**$27,785,000**	**$43,028,000**	**$44,287,000**

Operations and Maintenance Costs

Introduction

This section documents the Operations and Maintenance (O&M) cost calculation for each of the alternatives under consideration in the Red Rock Implementation Plan. Unit costs are multiplied by cost drivers in order to determine the total O&M cost of each alternative. **Figure 2** depicts the equation.



Figure 2: O&M Cost Calculation

This document includes three main sections: cost drivers, the cost calculation, and a discussion of the results.

Cost Drivers

Cost drivers are the statistics that determine the O&M cost of each individual cost category that make up the total O&M cost of the alternative. The O&M cost drivers are primarily derived from the **Service Plan Technical Memo**, including statistics such as revenue hours, revenue miles, and the number of peak vehicles required in maximum service. The operating frequency, travel time, and service span of the proposed service(s) are used to generate each of these statistics. Costs are incremental, so they reflect costs that are additional to conditions prior to construction. The summary of net cost drivers by Alternative is shown in **Table 15.**

Table 15: Net O&M Cost Driver Summary by Alternative

COST DRIVER	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
BRT Annual Revenue Hours	32,453	47,702	49,266
BRT Annual Revenue Miles	957,950	1,043,970	1,047,880
BRT Peak Buses	7	10	10
Net BRT Stations[1]	5	8	8
New Ticket Vending Machines	7	13	13
Validators	25	37	37
TSP Intersections	12	17	20
Total Fleet	9	12	12

[1] Net BRT stations refers to those in the corridor that are additional to those that will already be operating and maintained due to Gateway (the METRO Gold Line).

Cost Calculation

Unit costs are derived primarily from Metro Transit's Arterial Transitways Corridor Study[2]. Because the costs in this study were in 2010 dollars, the unit costs were inflated from 2010 to 2015 dollars (multiplied by 1.087 based on the consumer price index). **Tables 16** through **18** show the cost calculation of each of the build alternatives.

Table 16: Red Rock Alternative 1 O&M Cost Calculation (2015$)

COST	COST DRIVER	DRIVER	UNIT COST (2010$)	TOTAL COST (2010$)	TOTAL COST (2015$)
BRT Service	BRT Revenue Hours	32,453	$62.14	$2,017,000	$2,193,000
BRT Service	BRT Revenue Miles	957,950	$2.99	$2,864,000	$3,114,000
BRT Service	BRT Peak Buses	7	$36,498	$255,000	$278,000
BRT Service Subtotal					**$5,585,000**
Farebox O&M Reduction	Fleet Buses	9	$(2,000)	$(18,000)	$(20,000)
Station Maintenance	Stations	5	$2,000	$10,000	$11,000
Snow Removal	Stations	5	$3,500	$18,000	$19,000
Real-Time Signage O&M	Stations	5	$4,000	$20,000	$22,000
TVM O&M	Ticket Validating Machines	7	$10,000	$70,000	$76,000
Validator O&M	Validators	25	$150	$4,000	$4,000
TSP O&M	TSP Intersections	12	$2,800	$34,000	$37,000
Fare Enforcement	BRT Revenue Hours	32,453	$8.75	$284,000	$309,000
Transit Control Center/Street Ops	Stations	5	$8,000	$40,000	$43,000
Facility and Fare Collection Subtotal					**$501,000**
Total					**$6,086,000**

[2] http://www.metrotransit.org/Data/Sites/1/media/pdfs/atcs/conceptdevelopment.pdf; revised assumptions for real-time signage O&M and additional allowance for transit control center/street ops.

Table 17: Red Rock Alternative 2A O&M Cost Calculation (2015$)

COST	COST DRIVER	DRIVER	UNIT COST (2010$)	TOTAL COST (2010$)	TOTAL COST (2015$)
BRT Service	BRT Revenue Hours	47,702	$62.14	$2,964,000	$3,223,000
BRT Service	BRT Revenue Miles	1,043,970	$2.99	$3,121,000	$3,394,000
BRT Service	BRT Peak Buses	10	$36,498	$365,000	$397,000
BRT Service Subtotal					**$7,014,000**
Farebox O&M Reduction	Fleet Buses	12	$(2,000)	$(24,000)	$(26,000)
Station Maintenance	Stations	8	$2,000	$16,000	$17,000
Snow Removal	Stations	8	$3,500	$28,000	$30,000
Real-Time Signage O&M	Stations	8	$4,000	$32,000	$35,000
TVM O&M	Ticket Validating Machines	13	$10,000	$130,000	$141,000
Validator O&M	Validators	37	$150	$6,000	$6,000
TSP O&M	TSP Intersections	17	$2,800	$48,000	$52,000
Fare Enforcement	BRT Revenue Hours	47,702	$8.75	$417,000	$454,000
Transit Control Center/Street Ops	Stations	8	$8,000	$64,000	$70,000
Facility and Fare Collection Subtotal					**$779,000**
Total					**$7,793,000**

Table 18: Red Rock Alternative 2B O&M Cost Calculation (2015$)

COST	COST DRIVER	DRIVER	UNIT COST (2010$)	TOTAL COST (2010$)	TOTAL COST (2015$)
BRT Service	BRT Revenue Hours	49,266	$62.14	$3,061,000	$3,329,000
BRT Service	BRT Revenue Miles	1,047,880	$2.99	$3,133,000	$3,406,000
BRT Service	BRT Peak Buses	10	$36,498	$365,000	$397,000
BRT Service Subtotal					$7,132,000
Farebox O&M Reduction	Fleet Buses	12	$(2,000)	$(24,000)	$(26,000)
Station Maintenance	Stations	8	$2,000	$16,000	$17,000
Snow Removal	Stations	8	$3,500	$28,000	$30,000
Real-Time Signage O&M	Stations	8	$4,000	$32,000	$35,000
TVM O&M	Ticket Validating Machines	13	$10,000	$130,000	$141,000
Validator O&M	Validators	37	$150	$6,000	$6,000
TSP O&M	TSP Intersections	20	$2,800	$56,000	$61,000
Fare Enforcement	BRT Revenue Hours	49,266	$8.75	$431,000	$469,000
Transit Control Center/Street Ops	Stations	8	$8,000	$64,000	$70,000
Facility and Fare Collection Subtotal					**$803,000**
Total					**$7,935,000**

O&M Cost Discussion

The cost summary is shown in **Table 19.**

The total O&M cost ranges from a low of $6,086,000 for Alternative 1 to $7,935,000 for Alternative 2B. The lower cost of Alternative 1 on Highway 61 has to do with two main factors. First, it serves fewer stations than Alternative 2A and Alternative 2B. Second, this route operates almost exclusively on Highway 61, so the number of revenue hours is lower than the Alternative 2 with community-focused deviations.

Another important point is that Alternative 1 bypasses the Gateway Corridor and stations between the Union Depot and Highway 61, while Alternative 2 serves these stations.

Table 19: O&M Cost Summary (2015$)

COST CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B
BRT Service Cost	$5,585,000	$7,014,000	$7,132,000
Facility Maintenance and Fare Collection Cost	$501,000	$779,000	$803,000
Total O&M Cost (2015$)	**$6,086,000**	**$7,793,000**	**$7,935,000**

Appendix A: Capital Costs by Alternative

Red Rock Corridor - Alternative 1	
Length (mi)	24.5
No. of Stations	5

Item No.	SCC	Item Description	Quantity	Unit	Unit Cost (2015$)	Cost (2015$)	Allocated	Final Cost (2015$)
		Corridor Improvement				**$210,000**	**20%**	**$3,685,000**
1	10	Slip Ramp	450	LF	$200	$90,000	$18,000	$108,000
2	10	Earthwork(Import/Excavation & Embankment)	0	CY	$15	$0	$0	$0
3	10	Transit Signal Priority (TSP) Upgrades	12	EA	$10,000	$120,000	$24,000	$144,000
4	10	Retaining Wall	0	SF	$150	$0	$0	$0
5	10	Highway Bus Shoulder Improvements	1	LS	$3,433,000	$3,433,000		$3,433,000
		BRT Station				**$3,968,000**	**20%**	**$4,762,000**
6	20	Highway Station (Shelter and Amenities)	4	EA	$130,000	$520,000	$104,000	$624,000
7	20	Arterial Station (Enhanced Shelter)	3	EA	$65,000	$195,000	$39,000	$234,000
8	20	Station Platform	7	EA	$62,000	$434,000	$87,000	$520,000
9	40	Station Roadway Improvements	7	EA	$100,000	$700,000	$140,000	$840,000
10	40	Surface Park and Ride Lot	80	STALL	$4,000	$320,000	$64,000	$384,000
11	40	Utilities and Drainage Improvements (Major)	0	EA	$20,000	$0	$0	$0
12	40	Utilities and Drainage Improvements (Minor)	7	EA	$4,000	$28,000	$7,000	$35,000
13	40	Pedestrian Improvements (Major)	1	EA	$36,000	$36,000	$7,000	$43,000
14	40	Pedestrian Improvements (Minor)	2	EA	$10,000	$20,000	$4,000	$24,000
15	40	Pedestrian Improvements (Saint Paul Park)	1	EA	$85,000	$85,000	$17,000	$102,000
16	40	Traffic Control (Inline/Online)	1	EA	$30,000	$30,000	$6,000	$36,000
17	40	Traffic Control (Offline)	4	EA	$15,000	$60,000	$12,000	$72,000
18	50	Platform Systems Allowance	7	EA	$220,000	$1,540,000	$308,000	$1,848,000
		BRT Maintenance Facility				**$4,500,000**	**20%**	**$5,400,000**
19	30	BRT Maintenance Facility	1	EA	$4,500,000	$4,500,000	$900,000	$5,400,000
		Right of Way				**$132,000**	**100%**	**$264,000**
20	60	Commercial/Industrial	0.6	ACRE	$220,000	$132,000	$132,000	$264,000
21	60	Residential		ACRE	$0	$0	$0	$0
		Vehicles				**$4,572,000**	**5%**	**$4,801,000**
22	70	Low Floor 40-foot BRT Buses	9	EA	$500,000	$4,500,000	$225,000	$4,725,000
23	70	On-Board Go To Validator (per bus door)	18	EA	$4,000	$72,000	$4,000	$76,000
		Soft Costs						**$3,316,000**
24	80	Preliminary Engineering						$347,000
25	80	Final Design						$569,000
26	80	Project Management for Design and Construction						$268,000
27	80	Construction Administration and Management						$696,000
28	80	Insurance						$347,000

Item No.	SCC	Item Description	Quantity	Unit	Unit Cost (2015$)	Cost (2015$)	Allocated	Final Cost (2015$)
29	80	Legal; Permits; Review Fees by Other Agencies						$93,000
30	80	Surveys, Testing, Investigation, Inspection						$278,000
31	80	Agency Force Account Work						$580,000
32	80	Public Art						$138,000
	90	**25% Contingency**						**$5,557,000**
		Alternative 1 Total Cost						**$27,785,000**

Red Rock Corridor - Alternative 2A	
Length (mi)	26.7
No. of Stations	8

Item No.	SCC	Item Description	Quantity	Unit	Unit Cost ($2015)	Cost (2015$)	Allocated	Final Cost (2015$)
		Corridor Improvement				**$2,970,000**	**20%**	**$3,004,000**
1	10	Slip Ramp	0	LF	$200	$0	$0	$0
2	10	Earthwork(Import/Excavation & Embankment)	0	CY	$15	$0	$0	$0
3	10	Transit Signal Priority (TSP) Upgrades	17	EA	$10,000	$170,000	$34,000	$204,000
4	10	Retaining Wall	0	SF	$150	$0	$0	$0
5	10	Highway Bus Shoulder Improvements	1	LS	$2,800,000	$2,800,000	$0	$2,800,000
		BRT Station				**$6,605,000**	**20%**	**$7,928,000**
6	20	Highway Station (Shelter and Amenities)	3	EA	$130,000	$390,000	$78,000	$468,000
7	20	Arterial Station (Enhanced Shelter)	10	EA	$65,000	$650,000	$130,000	$780,000
8	20	Station Platform	13	EA	$62,000	$806,000	$161,000	$967,000
9	40	Station Roadway Improvements	13	EA	$100,000	$1,300,000	$260,000	$1,560,000
10	40	Surface Park and Ride Lot	40	STALL	$4,000	$160,000	$32,000	$192,000
11	40	Utilities and Drainage Improvements (Major)	2	EA	$20,000	$40,000	$8,000	$48,000
12	40	Utilities and Drainage Improvements (Minor)	11	EA	$4,000	$44,000	$11,000	$55,000
13	40	Pedestrian Improvements (Major)	0	EA	$36,000	$0	$0	$0
14	40	Pedestrian Improvements (Minor)	6	EA	$10,000	$60,000	$12,000	$72,000
15	40	Pedestrian Improvements (Saint Paul Park)	1	EA	$85,000	$85,000	$17,000	$102,000
16	50	Pedestrian Traffic Signal (95th Street Station)	1	EA	$75,000	$75,000	$15,000	$90,000
17	40	Traffic Control (Inline/Online)	1	EA	$30,000	$30,000	$6,000	$36,000
18	40	Traffic Control (Offline)	7	EA	$15,000	$105,000	$21,000	$126,000
19	50	Platform Systems Allowance	13	EA	$220,000	$2,860,000	$572,000	$3,432,000
		BRT Maintenance Facility				**$6,000,000**	**20%**	**$7,200,000**
20	30	BRT Maintenance Facility	1	EA	$6,000,000	$6,000,000	$1,200,000	$7,200,000
		Right of Way				**$44,000**	**100%**	**$88,000**
21	60	Commercial/Industrial	0.2	ACRE	$220,000	$44,000	$44,000	$88,000
22	60	Residential	0	ACRE	$0	$0	$0	$0
		Vehicles				**$6,096,000**	**5%**	**$6,401,000**

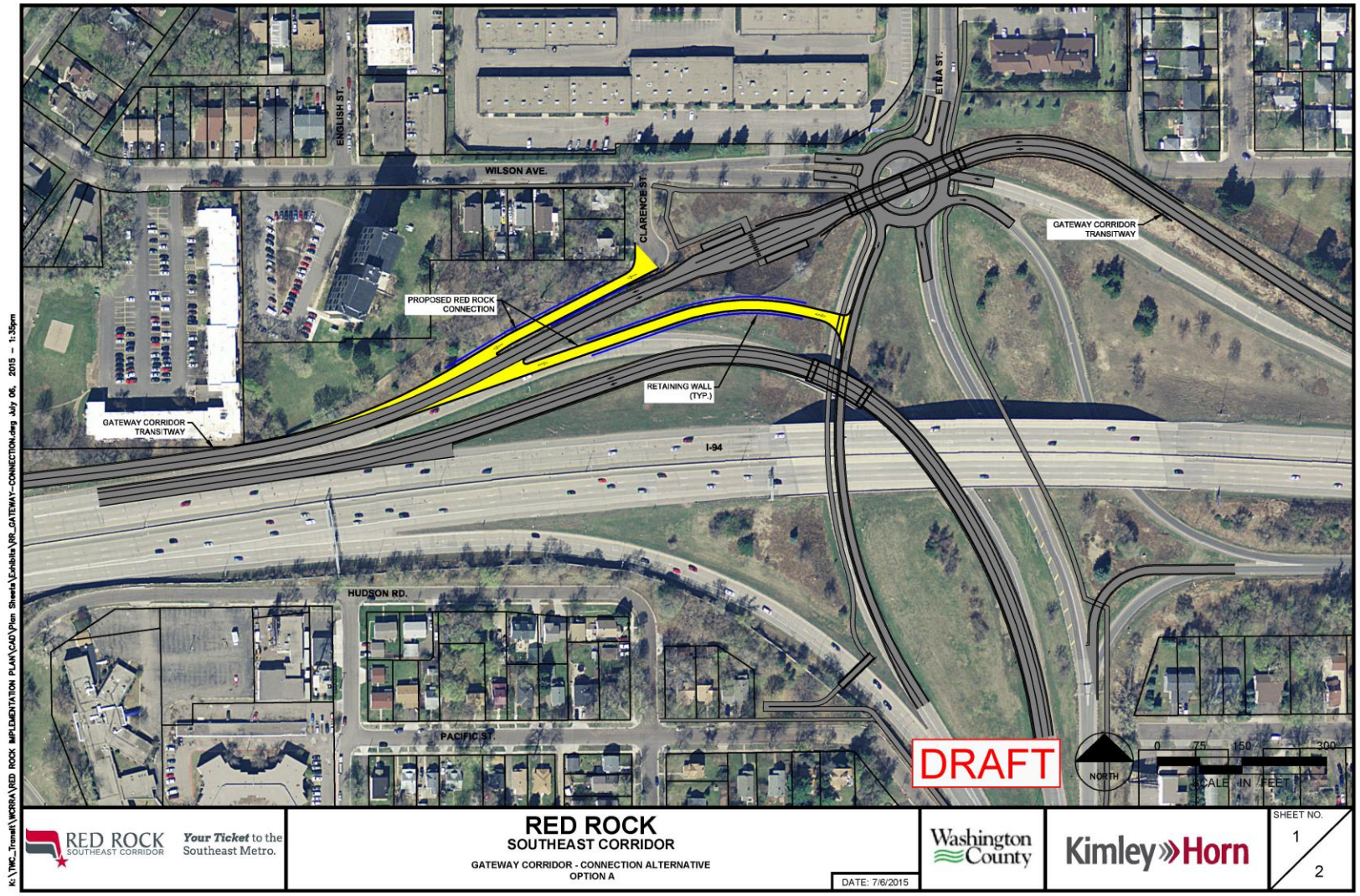
Item No.	SCC	Item Description	Quantity	Unit	Unit Cost ($2015)	Cost (2015$)	Allocated	Final Cost (2015$)
23	70	Low Floor 40-foot BRT Buses	12	EA	$500,000	$6,000,000	$300,000	$6,300,000
24	70	On-Board Go To Validator (per bus door)	24	EA	$4,000	$96,000	$5,000	$101,000
		Soft Costs						**$5,699,000**
25	80	Preliminary Engineering						$623,000
26	80	Final Design						$996,000
27	80	Project Management for Design and Construction						$434,000
28	80	Construction Administration & Management						$1,246,000
29	80	Insurance						$623,000
30	80	Legal; Permits; Review Fees by Other Agencies						$158,000
31	80	Surveys, Testing, Investigation, Inspection						$438,000
32	80	Agency Force Account Work						$1,000,000
33	80	Public Art						$181,000
		Gateway Corridor Connection Costs						**$5,123,000**
34	10	Guideway and track elements						$550,800
35	40	Site work & special conditions						$2,617,600
36	50	Systems						$21,600
37	80	Professional Services						$908,000
38	90	Unallocated Contingency						$1,025,000
	90	**25% Contingency**						**$7,580,000**
		Alternative 2A Total Cost						**$43,023,000**

Red Rock Corridor - Alternative 2B	
Length (mi)	26.8
No. of Stations	8

Item No.	SCC	Item Description			Unit Cost (2015$)	Cost (2015$)	Allocated	Final Cost (2015$)
		Corridor Improvement				**$3,000,000**	**20%**	**$3,040,000**
1	10	Slip Ramp	0	LF	$200	$0	$0	$0
2	10	Earthwork(Import/Excavation & Embankment)	0	CY	$15	$0	$0	$0
3	10	Transit Signal Priority (TSP) Upgrades	20	EA	$10,000	$200,000	$40,000	$240,000
4	10	Retaining Wall	0	SF	$150	$0	$0	$0
5	10	Highway Bus Shoulder Improvements	1	LS	$2,800,000	$2,800,000		$2,800,000
		BRT Station				**$7,291,925**	**20%**	**$8,754,000**
6	20	Highway Station (Shelter and Amenities)	3	EA	$130,000	$390,000	$78,000	$468,000
7	20	Arterial Station (Enhanced Shelter)	10	EA	$65,000	$650,000	$130,000	$780,000
8	20	Station Platform	13	EA	$62,000	$806,000	$161,000	$967,000
9	40	Station Roadway Improvements	13	EA	$100,000	$1,300,000	$260,000	$1,560,000
10	40	Surface Park and Ride Lot	124	STALL	$4,000	$496,000	$99,000	$595,000
11	40	Remove Bituminous Pavement	5,800	SY	$5	$29,000	$6,000	$35,000
12	40	Bituminous Pavement	30,700	SF	$7	$207,225	$41,000	$249,000
13	40	Common Excavation	10,400	CY	$8	$83,200	$17,000	$101,000
14	40	Common Embankment	2,500	CY	$6	$15,000	$3,000	$18,000
15	40	Concrete Curb & Gutter	1,400	LF	$15	$21,000	$4,000	$25,000
16	40	Storm Sewer Pipe	700	LF	$75	$52,500	$11,000	$64,000
17	40	Utilities and Drainage Improvements (Major)	2	EA	$20,000	$40,000	$8,000	$48,000
18	40	Utilities and Drainage Improvements (Minor)	9	EA	$4,000	$36,000	$9,000	$45,000
19	40	Pedestrian Improvements (Major)	1	EA	$36,000	$36,000	$7,000	$43,000
20	40	Pedestrian Improvements (Minor)	5	EA	$10,000	$50,000	$10,000	$60,000
21	40	Pedestrian Improvements (Saint Paul Park)	1	EA	$85,000	$85,000	$17,000	$102,000
22	50	Relocate Traffic Signal (80th Street SB Station)	0	EA	$25,000	$0	$0	$0
23	40	Traffic Control (Inline/Online)	1	EA	$30,000	$30,000	$6,000	$36,000
24	40	Traffic Control (Offline)	7	EA	$15,000	$105,000	$21,000	$126,000
25	50	Platform Systems Allowance	13	EA	$220,000	$2,860,000	$572,000	$3,432,000
		BRT Maintenance Facility				**$6,000,000**	**20%**	**$7,200,000**
26	30	BRT Maintenance Facility	1	EA	$6,000,000	$6,000,000	$1,200,000	$7,200,000
		Right of Way				**$0**	**100%**	**$0**

Item No.	SCC	Item Description			Unit Cost (2015$)	Cost (2015$)	Allocated	Final Cost (2015$)
27	60	Commercial/Industrial	0	ACRE	$220,000	$0	$0	$0
28	60	Residential	0	ACRE	$0	$0	$0	$0
		Vehicles				**$6,096,000**	**5%**	**$6,401,000**
29	70	Low Floor 40-foot BRT Buses	12	EA	$500,000	$6,000,000	$300,000	$6,300,000
30	70	On-Board Go To Validator (per bus door)	24	EA	$4,000	$96,000	$5,000	$101,000
		Soft Costs						**$5,932,000**
31	80	Preliminary Engineering						$652,000
32	80	Final Design						$1,038,000
33	80	Project Management for Design & Construction						$448,000
34	80	Construction Administration & Management						$1,303,000
35	80	Insurance						$652,000
36	80	Legal; Permits; Review Fees by Other Agencies						$163,000
37	80	Surveys, Testing, Investigation, Inspection						$448,000
38	80	Agency Force Account Work						$1,038,000
39	80	Public Art						$190,000
		Gateway Corridor Connection Costs						**$5,123,000**
40	10	Guideway and track elements						$550,800
41	40	Site work & special conditions						$2,617,600
42	50	Systems						$21,600
43	80	Professional Services						$908,000
44	90	Unallocated Contingency						$1,025,000
	90	**Unallocated 25% Contingency**						**$7,840,000**
		Alternative 2B Total Cost						**$44,290,000**

Appendix B: METRO Gold Line Guideway Connection Design Concepts


ENGLISH ST.
WILSON AVE.
CLARENCE ST.
ETNA ST.
GATEWAY CORRIDOR TRANSITWAY
PROPOSED RED ROCK CONNECTION
RETAINING WALL (TYP.)
GATEWAY CORRIDOR TRANSITWAY
I-94
HUDSON RD.
PACIFIC ST.
DRAFT
NORTH
0 75 150 300
SCALE IN FEET
RED ROCK SOUTHEAST CORRIDOR
Your Ticket to the Southeast Metro.
RED ROCK
SOUTHEAST CORRIDOR
GATEWAY CORRIDOR - CONNECTION ALTERNATIVE
OPTION A
DATE: 7/6/2015
Washington County
Kimley»Horn
SHEET NO.
1
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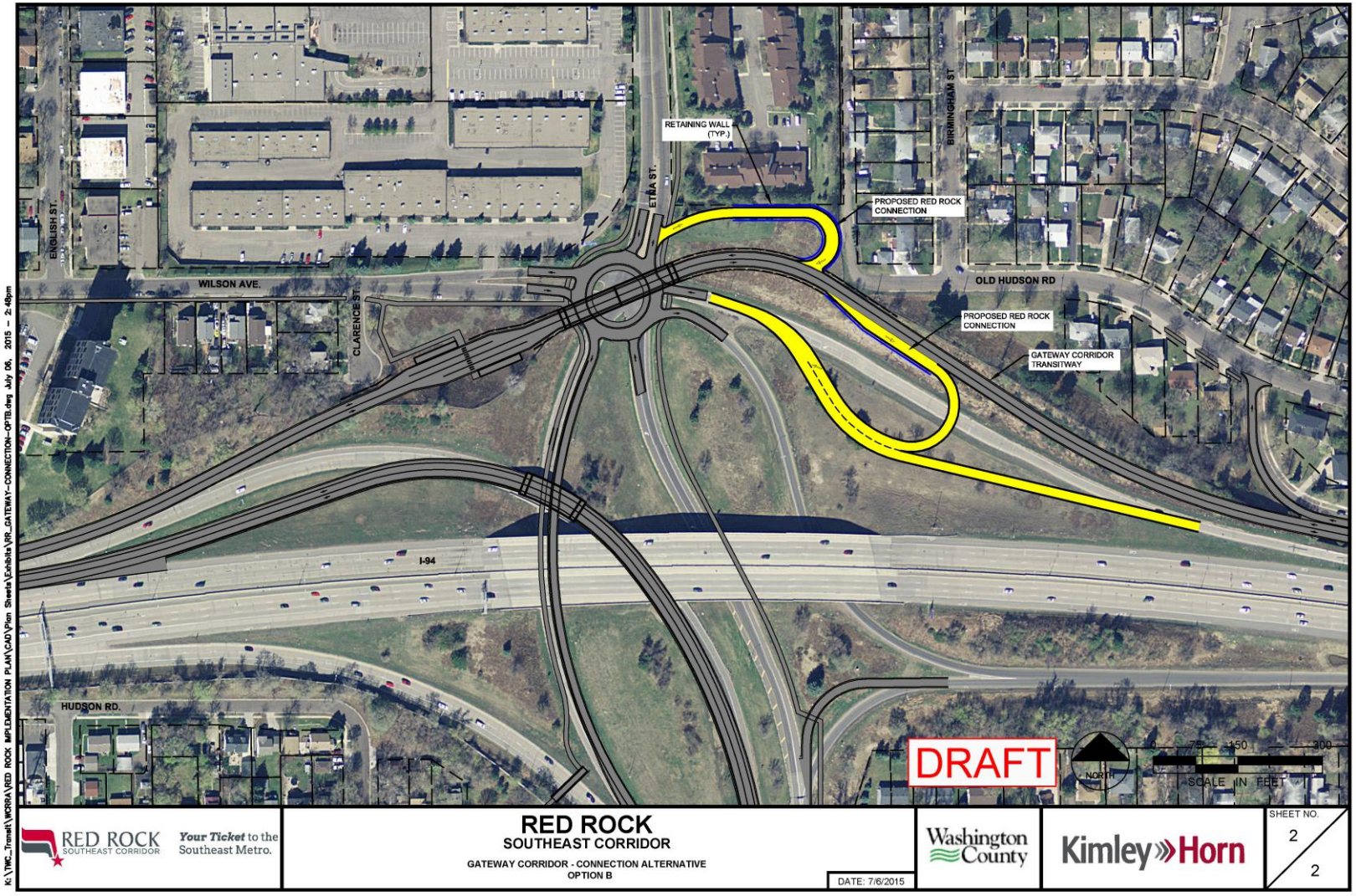
RETAINING WALL (TYP.)
ETNA ST.
BIRMINGHAM ST
ENGLISH ST.
WILSON AVE.
CLARENCE ST.
PROPOSED RED ROCK CONNECTION
OLD HUDSON RD
PROPOSED RED ROCK CONNECTION
GATEWAY CORRIDOR TRANSITWAY
I-94
HUDSON RD.
DRAFT
NORTH
0 75 150 300
SCALE IN FEET
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RED ROCK SOUTHEAST CORRIDOR
Your Ticket to the Southeast Metro.
RED ROCK
SOUTHEAST CORRIDOR
GATEWAY CORRIDOR - CONNECTION ALTERNATIVE
OPTION B
DATE: 7/6/2015
Washington County
Kimley»Horn
SHEET NO.
2
2