

## **APPENDIX I**

### Relative Capital Cost Comparison for Division Street Corridor Study Technical Memo

## TECHNICAL MEMORANDUM

DATE: January 11, 2021  
TO: Spokane Transit Authority  
FROM: Patrick Krych  
SUBJECT: Relative Capital Cost Comparison for  
Division Street Corridor Study  
CC: Darby Watson  
Morgan Stumpf  
Alicia McIntire  
PROJECT NUMBER: 374-2941-001  
PROJECT NAME: Division Street Corridor Study

### Cost Estimate Overview

Parametrix has developed a high-level relative cost comparison of the Division Street Corridor Study. Four project concept scenarios were developed for alternative screening. These scenarios include bus rapid transit corridor and roadway improvements. The street configuration varies based on the scenario. These alternative scenarios include:

- Scenario C1 = Center-Running Alternative
- Scenario S1 = Side-Running A Alternative
- Scenario S2 = Side-Running B Alternative
- Scenario S3 = Side-Running C Alternative

The intent of the cost estimate is to compare corridor alternative scenarios using range of magnitude costs. This tech memo summarizes the cost estimate approach and provides backup documentation for the cost estimates. The construction costs along with associated project contingencies and known project costs are described in the below sections. A cost estimate summary is attached, along with a cost estimate backup information for each scenario.

It should be noted the estimates are at a very high level which can lead to wide variations in estimated costs. The estimates were based on alignment information and quantity information is very limited at this early stage of project.

### Construction Cost Estimate:

The basis of the cost estimate is based on the planning level cross-sections. The cross sections were developed to depict the desired lane configurations for the various scenarios and segments of the corridor.

Using these cross sections, costs were assigned to the known construction elements and allowances for some of the unknown construction elements were assigned. In addition to the allowances, a large contingency of 50% was applied due to the early level of development and unknown components of the project. All costs are high level and estimated on a per mile basis.

General Transportation: cross-section items known and included in the cost estimate include:

- Removal items
  - Earthwork (cut/fill)
  - Grind/inlay (per area with depth identified)
  - New roadway construction (per area with section identified)
    - Asphalt concrete pavement
    - Portland cement concrete pavement
    - Aggregate base
  - Curb
  - Sidewalk
  - Multiuse path
  - Drainage/Stormwater and utilities – allowance per mile.
  - Traffic items including Striping/pavement markings – allowance per mile.
  - Traffic Signal(s) – new and modifications – allowance per signalized intersection.
- Transit: discipline items included:
    - Transit Stations

Unit cost pricing for each of the known construction elements were determined using historical bid analysis information and the recent bid tabs for the Central City Line project.

### Right of way Acquisition

For this estimate, it was assumed there was sufficient right of way throughout the corridor for all but one of the alternatives. The estimate includes right of way costs for Scenario C (center running) at each of the transit stations. The ROW cost was estimated at 5000 sf per station (10'x200' each to accommodate left turn pocket and center station platform, plus transition) at \$40/sf based on recent estimates for commercial property on Division Street, using Zillow estimates.

### Professional Services

Professional services include allowances for preliminary engineering, final design, permitting, construction management. These allowances vary based on the scope of work. Suggested allowances are shown below and have been included in the current estimate:

- Preliminary Engineering and Environmental Review - 8%
- Final Design - 10%
- Permitting – 5%
- Construction Management - 10%

## Project Costs

Total project costs for each scenario were developed by combining the construction cost, ROW acquisition, and professional services. For the purpose of the alternative screening, refer to Attachment A Summary cost comparison.

Station programming such as kiss and rides, park and ride lots, operator facilities or fleet vehicles, charging or other technologies were not included in the estimates. In addition, it is known that the existing operations and maintenance base cannot accommodate the additional fleet that would be added to serve this new corridor. These costs are also not included in the cost estimates until additional information is known about the potential base expansion.

## Attachments

Attachment A – Summary Cost Comparison

Attachment B – Backup Cost Estimates per Scenario

**Relative Capital Costs based on Concept level Cross-Sections**

## PROJECT COST COMPARISON SUMMARY

|                        | Scenario C1                | Scenario S1                | Scenario S2                | Scenario S3                |
|------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
|                        | Center-Running Alternative | Side-Running A Alternative | Side-Running B Alternative | Side-Running C Alternative |
| Mainline               | \$ 83,000,000              | \$ 72,000,000              | \$ 73,000,000              | \$ 71,000,000              |
| Ruby/Division couplet  | \$ 48,000,000              | \$ 37,000,000              | \$ 54,000,000              | \$ 49,000,000              |
| Total approximate cost | \$ 131,000,000             | \$ 109,000,000             | \$ 127,000,000             | \$ 120,000,000             |

Assumptions:

This estimate is based on planning level cross sections and 0% design

Mainline: Estimated from Cleveland Ave (north end of couplet section) - to North Division Y, approximately 3.8 miles

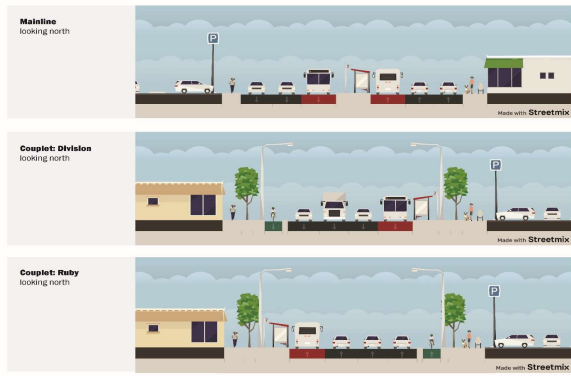
Couplet: River to Cleveland approximately 1.4 miles

Vehicle costs are not included

Maintenance Base upgrades are not included

Technology and Charging costs are not included in the estimate

Center-Running Alternative



|                                      |     |   |
|--------------------------------------|-----|---|
| <b>Ruby/Division Couplet Segment</b> |     | (feet)                                  |
| Existing Pavement width              |     | 50                                      |
| Existing Right of Way width          |     | 100                                     |
| Back of walk to back of walk         |     | 75 estimated                            |
| Existing sidewalk-swale-C&G          |     | 15                                      |
|                                      |     |   |
| Proposed section                     | HMA | Lanes 3 Width (ft) 36 grind and overlay |
|                                      | PCC | 1 12                                    |
| C&G one side                         |     | 2                                       |
| Curb separated Bicycle lane          |     | 6                                       |
| Roadside swale - reconstructed       |     | 8 Approx. existing swale in segment     |
| Sidewalk replaced                    |     | 5                                       |
|                                      |     | <b>84</b>                               |

Opinion of Project Cost - Planning 0% complete

**COUPLER RUBY/DIVISION - SCENARIO C1**

EACH DIRECTION OF COUPLER

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount            | Notes  |
|--|-----------------|----------|---------------|----------------------|--|
| <b>PREPARATION</b>   |                 |          |               |                      |  |
| PLANNING BITUMINOUS PAVEMENT (3" THICK)                                      | SY              | 21120    | \$ 5          | \$ 105,600           |  |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280     | \$ 20         | \$ 105,600           |  |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 2933     | \$ 20         | \$ 58,667            |  |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 5280     | \$ 5          | \$ 26,400            |  |
| <b>GRADING</b>   |                 |          |               | \$ -                 |  |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 6600     | \$ 60         | \$ 396,000           |  |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |                      |  |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 7040     | \$ 120        | \$ 844,800           |  |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 2441     | \$ 225        | \$ 549,120           |  |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |                      |  |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 7040     | \$ 2          | \$ 14,080            |  |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 1955     | \$ 65         | \$ 127,060           |  |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 323      | \$ 65         | \$ 20,973            |  |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 3608     | \$ 75         | \$ 270,600           |  |
| <b>TRAFFIC</b>   |                 |          |               |                      |  |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -                 | No islands in this segment                             |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280     | \$ 30         | \$ 158,400           | one side estimated                                     |
| GENERIC STRIPING, INCL. MARKINGS   | LF              | 5280     | \$ 20         | \$ 105,600           |  |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000            |  |
| <b>OTHER</b>   |                 |          |               |                      |  |
| CEMENT CONCRETE SIDEWALK   | SY              | 2933     | \$ 90         | \$ 264,000           |  |
|  |                 |          |               | \$ -                 |  |
|  |                 |          |               | \$ -                 |  |
| <b>UTILITIES</b>   |                 |          |               |                      |  |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000           | estimated based on sample mile on Division City GIS    |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000            |  |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 4693     | \$ 35         | \$ 164,267           |  |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               | <b>\$ 3,511,167</b>  |  |
|  |                 |          |               |                      |  |
| LENGTH OF SEGMENT EACH SIDE (RUBY/DIVISION)                                  | MI              | 1.4      |               | \$ 4,915,634         |  |
| MULTIPLY X2 (FOR EACH SIDE OF COUPLER)                                       |                 |          |               | <b>\$ 9,831,267</b>  |  |
| <b>FIXED NUMBER ITEMS</b>  |                 |          |               |                      |  |
| <b>STATION</b>   |                 |          |               |                      |  |
| TRAFFIC SIGNAL SYSTEM  | EACH            | 14       | \$ 250,000    | \$ 3,500,000         | 14 signalized intersections within the coupler segment |
| MAJOR STATION AT SIGNALIZED INTERSECTION                                     | EACH            | 14       | \$ 500,000    | \$ 7,000,000         | Side station   |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 20,331,267</b> |  |
| MOBILIZATION (10%)   |                 | 10%      |               | \$ 2,033,127         |  |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 22,364,394</b> |  |
| PLANNING CONTINGENCY (50%)   |                 | 50%      |               | \$ 11,182,197        |  |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 33,546,591</b> |  |
| <b>PROFESSIONAL SERVICES</b>   |                 |          |               |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW                             |                 | 8%       |               | \$ 2,683,727         |  |
| FINAL DESIGN   |                 | 10%      |               | \$ 3,354,659         |  |
| PERMITTING   |                 | 5%       |               | \$ 1,677,330         |  |
| CONSTRUCTION MANAGEMENT  |                 | 10%      |               | \$ 3,354,659         |  |
| RIGHT OF WAY (5000 SF/STATION)   | SF              | 70000    | \$ 40.00      | \$ 2,800,000         | Assume 10'x200'+Transitions=5000sf per station         |
| <b>TOTAL COST</b>  |                 |          |               | <b>\$ 47,416,966</b> |  |

Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay of GP lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Bicycle lane to be curb separated from traffic on right
6. Swale on Ruby will be reconstructed.

Center-Running Alternative



| Center-Left Division segment                  |     |   |     | (feet)  |  |
|---|-----|---|-----|---|--|
| Existing Pavment width                        |     |   | 80  |   |  |
| Existing Right of Way width                   |     |   | 100 | estimated avg   |  |
| Back of walk to back of walk                  |     |   | 88  | estimated avg   |  |
| Existing sidewalk-swale-C&G                   |     |   | 0   |   |  |
| Proposed section                              | HMA | 4 | 44  | grind and overlay   |  |
|   | PCC | 2 | 24  |   |  |
| C&G   |     |   | 4   | both sides  |  |
| Curb separated Bicycle lane                   |     |   | 0   |   |  |
| Roadside swale                                |     |   | 8   | Does not currently exist, but added as a costing measure for storm, may not be feasible |  |
| Cement Conc sidewalk (center channelizations) |     |   | 12  | will either be station sidewalk or turn lanes etc.                                      |  |
| Cement Conc. Sidewalk                         |     |   | 10  |   |  |
|   |     |   | 102 |   |  |

Opinion of Project Cost - Planning 0% complete

**MAINLINE - SCENARIO C1**  
Cleveland to the "Y"

| Standard Item Description  | Unit of Measure | Qty/MILE    | Unit Price \$ | \$ Amount            | Notes  |
|--|-----------------|-------------|---------------|----------------------|--|
| <b>PREPARATION</b>   |                 |             |               |                      |  |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 25813.33333 | \$ 5          | \$ 129,067           |  |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 8560        | \$ 20         | \$ 171,200           | both sides   |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 9511        | \$ 20         | \$ 190,222           |  |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 10560       | \$ 5          | \$ 52,800            | adjacent to two bus lanes  |
| <b>GRADING</b>   |                 |             |               |                      |  |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 12027       | \$ 60         | \$ 721,600           |  |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |             |               |                      |  |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 14080       | \$ 120        | \$ 1,689,600         |  |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 4881        | \$ 225        | \$ 1,098,240         |  |
| <b>HOT MIX ASPHALT</b>   |                 |             |               |                      |  |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 14080       | \$ 2          | \$ 28,160            |  |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 3910        | \$ 65         | \$ 254,121           |  |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 645         | \$ 65         | \$ 41,947            |  |
| HMA CL 1/2 IN. PG 70-28, 3 INCH THICK  | TON             | 4410        | \$ 75         | \$ 330,733           |  |
| <b>TRAFFIC</b>   |                 |             |               |                      |  |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 9960        | \$ 30         | \$ 298,800           | Channelization islands for entire length (minus 100' @major intersecti |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 8560        | \$ 30         | \$ 256,800           |  |
| GENERIC STRIPING, INCL MARKINGS  | LF              | 5280        | \$ 40         | \$ 211,200           |  |
| <b>OTHER</b>   |                 |             |               |                      |  |
| CEMENT CONCRETE SIDEWALK   | SY              | 9511        | \$ 90         | \$ 856,000           |  |
|  |                 |             |               | \$ -                 |  |
|  |                 |             |               | \$ -                 |  |
| <b>UTILITIES</b>   |                 |             |               |                      |  |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100         | \$ 2,000      | \$ 200,000           | estimated based on sample mile on Division City GIS                    |
| UTILITY ALLOWANCES   | LS              | 1           | \$ 50,000     | \$ 50,000            |  |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 4693        | \$ 35         | \$ 164,267           |  |
| <b>PER MILE SUB-TOTAL</b>  |                 |             |               | <b>\$ 6,744,756</b>  |  |
| <b>LENGTH OF SEGMENT CLEVELAND TO Y</b>                                      |                 | MI          | 3.8           | <b>\$ 25,630,073</b> |  |
| <b>FIXED NUMBER ITEMS</b>  |                 |             |               |                      |  |
| <b>STATION</b>   |                 |             |               |                      |  |
| TRAFFIC SIGNAL SYSTEM  | EACH            | 14          | \$ 250,000    | \$ 3,500,000         | 14 signalized intersections north of couplet segment                   |
| MAJOR STATION AT SIGNALIZED INTERSECTION                                     | EACH            | 14          | \$ 500,000    | \$ 7,000,000         | One center left side boarding station accomodates both directions.     |
| <b>SUB-TOTAL</b>   |                 |             |               | <b>\$ 36,130,073</b> |  |
| MOBILIZATION (10 %)  |                 | 10%         |               | \$ 3,613,007         |  |
| <b>SUB-TOTAL</b>   |                 |             |               | <b>\$ 39,743,080</b> |  |
| PLANNING CONTINGENCY (50%)   |                 | 50%         |               | \$ 19,871,540        |  |
| <b>SUB-TOTAL</b>   |                 |             |               | <b>\$ 59,614,621</b> |  |
| <b>PROFESSIONAL SERVICES</b>   |                 |             |               |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW                             |                 | 8%          |               | \$ 4,769,170         |  |
| FINAL DESIGN   |                 | 10%         |               | \$ 5,961,462         |  |
| PERMITTING   |                 | 5%          |               | \$ 2,980,731         |  |
| CONSTRUCTION MANAGEMENT  |                 | 10%         |               | \$ 5,961,462         |  |
| RIGHT OF WAY (5000 SF/STATION)   | SF              | 70000       | \$ 40.00      | \$ 2,800,000         | Assume 10'x200'+Transitions=5000sf per station                         |
| <b>TOTAL COST</b>  |                 |             |               | <b>\$ 82,087,446</b> |  |

Assumptions:

1. Curb, gutter & sidewalk on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay of GP lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Swale not shown, but used only for stormwater estimate

Side-Running A Alternative



|                                      |       |        |           |
|--------------------------------------|-------|--------|-----------|
| <b>Ruby/Division Couplet Segment</b> |       | (feet) |           |
| Existing Pavement width              |       | 50     |           |
| Existing Right of Way width          |       | 100    |           |
| Back of walk to back of walk         |       | 75     | estimated |
| Existing sidewalk-swale-C&G          |       | 15     |           |
|                                      |       |        |           |
|                                      | Lanes |        |           |
| Proposed section                     | HMA   | 3      | 36        |
|                                      | PCC   | 2      | 12        |
| C&G one side                         |       |        | 2         |
| Curb separated Bicycle lane          |       |        | 6         |
| Roadside swale - reconstructed       |       |        | 8         |
| Sidewalk replaced this side          |       |        | 5         |
|                                      |       |        | <hr/> 84  |

Opinion of Project Cost - Planning 0% complete

**COUPLER RUBY/DIVISION - SCENARIO S1**

EACH DIRECTION OF COUPLER

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount            | Notes  |
|--|-----------------|----------|---------------|----------------------|--|
| <b>PREPARATION</b>   |                 |          |               |                      |  |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 21120    | \$ 5          | \$ 105,600           |  |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280     | \$ 20         | \$ 105,600           |  |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 2933     | \$ 20         | \$ 58,667            |  |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 5280     | \$ 5          | \$ 26,400            |  |
| <b>GRADING</b>   |                 |          |               |                      |  |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 6600     | \$ 60         | \$ 396,000           |  |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |                      |  |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 7040     | \$ 120        | \$ 844,800           |  |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 2441     | \$ 225        | \$ 549,120           |  |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |                      |  |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 7040     | \$ 2          | \$ 14,080            |  |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 1955     | \$ 65         | \$ 127,060           |  |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 323      | \$ 65         | \$ 20,973            |  |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 3608     | \$ 75         | \$ 270,600           |  |
| <b>TRAFFIC</b>   |                 |          |               |                      |  |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -                 | No islands in this segment                             |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280     | \$ 30         | \$ 158,400           | one side   |
| GENERIC STRIPING, INCL. MARKINGS   | LF              | 5280     | \$ 20         | \$ 105,600           |  |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000            |  |
| <b>OTHER</b>   |                 |          |               |                      |  |
| CEMENT CONCRETE SIDEWALK   | SY              | 2933     | \$ 90         | \$ 264,000           |  |
|  |                 |          |               | \$ -                 |  |
|  |                 |          |               | \$ -                 |  |
| <b>UTILITIES</b>   |                 |          |               |                      |  |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000           | estimated based on sample mile on Division City GIS    |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000            |  |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 4693     | \$ 35         | \$ 164,267           |  |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               | <b>\$ 3,511,167</b>  |  |
|  |                 |          |               |                      |  |
| <i>LENGTH OF SEGMENT EACH SIDE (RUBY/DIVISION)</i>                           | MI              | 1.4      |               | \$ 4,915,634         |  |
| <i>MULTIPLY X2 (FOR EACH SIDE OF COUPLER)</i>                                |                 |          |               | <b>\$ 9,831,267</b>  |  |
| <b>FIXED NUMBER ITEMS</b>  |                 |          |               |                      |  |
| <b>STATION</b>   |                 |          |               |                      |  |
| TRAFFIC SIGNAL SYSTEM  | EACH            | 14       | \$ 250,000    | \$ 3,500,000         | 14 signalized intersections within the coupler segment |
| MAJOR STATION AT SIGNALIZED INTERSECTION                                     | EACH            | 14       | \$ 250,000    | \$ 3,500,000         | Side station   |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 16,831,267</b> |  |
| MOBILIZATION (10 %)  |                 | 10%      |               | \$ 1,683,127         |  |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 18,514,394</b> |  |
| PLANNING CONTINGENCY (50%)   |                 | 50%      |               | \$ 9,257,197         |  |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 27,771,591</b> |  |
| <b>PROFESSIONAL SERVICES</b>   |                 |          |               |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW                             |                 | 8%       |               | \$ 2,221,727         |  |
| FINAL DESIGN   |                 | 10%      |               | \$ 2,777,159         |  |
| PERMITTING   |                 | 5%       |               | \$ 1,388,580         |  |
| CONSTRUCTION MANAGEMENT  |                 | 10%      |               | \$ 2,777,159         |  |
| RIGHT OF WAY (5000 SF/STATION)   | SF              | 0        | \$ 40.00      | \$ -                 | Assume no R/W for right side stations                  |
| <b>TOTAL COST</b>  |                 |          |               | <b>\$ 36,936,216</b> |  |

Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Bicycle lane to be curb separated from traffic on right
6. No R/W for right side stations & no other R/W estimated
7. Swale not shown, but used only for stormwater estimate



Side-Running A Alternative



|                                    |        |               |
|------------------------------------|--------|---------------|
| <b>Side Right Division Section</b> | (feet) |               |
| Existing Pavement width            | 80     |               |
| Existing Right of Way width        | 100    | estimated avg |
| Back of walk to back of walk       | 88     | estimated avg |
| Existing sidewalk-swale-C&G        | 0      |               |

|                                |       |   |   |
|--------------------------------|-------|---|---|
|                                | Lanes |   |   |
| Proposed section               | HMA   | 5 | 55 2-PCC, 4 HMA, 1 center HMA lane  |
|                                | PCC   | 2 | 24  |
| C&G                            |       |   | 4   |
| Curb separated Bicycle lane    |       |   | 0   |
| Roadside swale - reconstructed |       |   | 8 Does not currently exist, but added as a costing measure for storm, may not be feasible |
| Cement Conc. Sidewalk          |       |   | 5   |
|                                |       |   | <hr/> 96  |

Opinion of Project Cost - Planning 0% complete  
**MAINLINE - SCENARIO S1**  
 Cleveland to the "Y"

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount     | Notes   |
|--|-----------------|----------|---------------|---------------|---|
| <b>PREPARATION</b>   |                 |          |               |               |   |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 32267    | \$ 5          | \$ 161,333    |   |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 8560     | \$ 20         | \$ 171,200    |   |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 4756     | \$ 20         | \$ 95,111     |   |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 10560    | \$ 5          | \$ 52,800     |   |
| <b>GRADING</b>   |                 |          |               |               |   |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 10120    | \$ 60         | \$ 607,200    |   |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |               |   |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 14080    | \$ 120        | \$ 1,689,600  |   |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 4881     | \$ 225        | \$ 1,098,240  |   |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |               |   |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 14080    | \$ 2          | \$ 28,160     |   |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 3910     | \$ 65         | \$ 254,121    |   |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 323      | \$ 65         | \$ 20,973     |   |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 5512     | \$ 75         | \$ 413,417    |   |
| <b>TRAFFIC</b>   |                 |          |               |               |   |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -          | - Center turn lane , no curbed channelization       |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 8560     | \$ 30         | \$ 256,800    | Assume between the curbs                            |
| GENERIC STRIPING, INCL. MARKINGS   | LF              | 5280     | \$ 40         | \$ 211,200    |   |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000     |   |
| <b>OTHER</b>   |                 |          |               |               |   |
| CEMENT CONCRETE SIDEWALK   | SY              | 2933     | \$ 105        | \$ 308,000    |   |
|  |                 |          |               | \$ -          |   |
|  |                 |          |               | \$ -          |   |
| <b>UTILITIES</b>   |                 |          |               |               |   |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000    | estimated based on sample mile on Division City GIS |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000     |   |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 4693     | \$ 35         | \$ 164,267    |   |
|  |                 |          |               | \$ 5,832,422  |   |
|  |                 |          |               |               |   |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               |               |   |
|  |                 |          |               |               |   |
| <i>LENGTH OF SEGMENT CLEVELAND TO Y</i>                                      | MI              | 3.8      |               | \$ 22,163,202 |   |

**FIXED NUMBER ITEMS**

| <b>STATION</b>                                   |      |     |            |               |  |
|--|------|-----|------------|---------------|--|
| TRAFFIC SIGNAL SYSTEM                            | EACH | 14  | \$ 250,000 | \$ 3,500,000  | 14 signalized intersections north of couplet segment |
| MAJOR STATION AT SIGNALIZED INTERSECTION         | EACH | 28  | \$ 250,000 | \$ 7,000,000  | Two side stations per intersection                   |
|  |      |     |            | \$ 32,663,202 |  |
|  |      |     |            | \$ 3,266,320  |  |
| MOBILIZATION (10 %)                              |      |     |            | \$ 35,929,522 |  |
|  |      |     |            | \$ 17,964,761 |  |
| PLANNING CONTINGENCY (50%)                       |      |     |            | \$ 53,894,284 |  |
| <b>PROFESSIONAL SERVICES</b>                     |      |     |            |               |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW |      | 8%  |            | \$ 4,311,543  |  |
| FINAL DESIGN                                     |      | 10% |            | \$ 5,389,428  |  |
| PERMITTING                                       |      | 5%  |            | \$ 2,694,714  |  |
| CONSTRUCTION MANAGEMENT                          |      | 10% |            | \$ 5,389,428  |  |
| RIGHT OF WAY (5000 SF/STATION)                   | SF   | 0   | \$ 40.00   | \$ -          | - Assume no R/W for right side stations              |
| <b>TOTAL COST</b>                                |      |     |            | \$ 71,679,397 |  |

Notes:

1. Assume Curb, gutter & sidewalk on one side will be preserved.
2. The other side C&G will be removed and replaced at wider limit.
3. Assume pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Bicycle lane to be curb separated from traffic on right
6. No R/W for right side stations & no other R/W estimated
7. Swale not shown, but used only for stormwater estimate

Side-Running B Alternative



|                              |     |       |           |                  |
|------------------------------|-----|-------|-----------|------------------|
| <b>Ruby Couplet Segment</b>  |     |       | (feet)    |                  |
| Existing Pavement width      |     |       | 50        |                  |
| Existing Right of Way width  |     |       | 100       |                  |
| Back of walk to back of walk |     |       | 75        | estimated        |
| Existing sidewalk-swale-C&G  |     |       | 15        |                  |
|                              |     |       |           |                  |
| Proposed section             | HMA | Lanes | 3         | 36               |
|                              | PCC |       | 2         | 24               |
| C&G                          |     |       |           | 4                |
| Curb separated Bicycle lane  |     |       |           | 12               |
| Roadside swale               |     |       |           | 8                |
| Sidewalk replaced this side  |     |       | 5         | replace one side |
|                              |     |       | <u>89</u> |                  |

Opinion of Project Cost - Planning 0% complete

**COUplet - SCENARIO S2**

**RUBY**

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount            | Notes  |
|--|-----------------|----------|---------------|----------------------|--|
| <b>PREPARATION</b>   |                 |          |               |                      |  |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 21120    | \$ 5          | \$ 105,600           |  |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280     | \$ 20         | \$ 105,600           |  |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 2933     | \$ 20         | \$ 58,667            |  |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 5280     | \$ 5          | \$ 26,400            |  |
| <b>GRADING</b>   |                 |          |               |                      |  |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 10120    | \$ 60         | \$ 607,200           |  |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |                      |  |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 14080    | \$ 120        | \$ 1,689,600         |  |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 4881     | \$ 225        | \$ 1,098,240         |  |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |                      |  |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 14080    | \$ 2          | \$ 28,160            |  |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 3910     | \$ 65         | \$ 254,121           |  |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 323      | \$ 65         | \$ 20,973            |  |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 4811     | \$ 75         | \$ 360,800           |  |
| <b>TRAFFIC</b>   |                 |          |               |                      |  |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -                 | No islands in this segment   |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280     | \$ 30         | \$ 158,400           | one side   |
| GENERIC STRIPING, INCL. MARKINGS   | LF              | 5280     | \$ 20         | \$ 105,600           |  |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000            |  |
| <b>OTHER</b>   |                 |          |               |                      |  |
| CEMENT CONCRETE SIDEWALK   | SY              | 2933     | \$ 90         | \$ 264,000           |  |
|  |                 |          | \$            | \$ -                 |  |
|  |                 |          | \$            | \$ -                 |  |
| <b>UTILITIES</b>   |                 |          |               |                      |  |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000           | estimated based on sample mile on Division City GIS                |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000            |  |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 4693     | \$ 35         | \$ 164,267           |  |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               | <b>\$ 5,347,627</b>  |  |
| <b>LENGTH OF SEGMENT (RUBY)</b>  |                 | MI       | 1.4           | <b>\$ 7,486,678</b>  |  |
| <b>FIXED NUMBER ITEMS</b>  |                 |          |               |                      |  |
| <b>STATION</b>   |                 |          |               |                      |  |
| TRAFFIC SIGNAL SYSTEM  | EACH            | 7        | \$ 500,000    | \$ 3,500,000         | 7 signalized intersections on Ruby segment premium for two way con |
| MAJOR STATION AT SIGNALIZED INTERSECTION                                     | EACH            | 14       | \$ 250,000    | \$ 3,500,000         | Side station - two per stop  |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 14,486,678</b> |  |
| MOBILIZATION (10%)   |                 | 10%      |               | \$ 1,448,668         |  |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 15,935,346</b> |  |
| PLANNING CONTINGENCY (50%)   |                 | 50%      |               | \$ 7,967,673         |  |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 23,903,019</b> |  |
| <b>PROFESSIONAL SERVICES</b>   |                 |          |               |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW                             |                 | 8%       |               | \$ 1,912,242         |  |
| FINAL DESIGN   |                 | 10%      |               | \$ 2,390,302         |  |
| PERMITTING   |                 | 5%       |               | \$ 1,195,151         |  |
| CONSTRUCTION MANAGEMENT  |                 | 10%      |               | \$ 2,390,302         |  |
| RIGHT OF WAY (5000 SF/STATION)   | SF              | 0        | \$ 40.00      | \$ -                 | Assume no R/W for right side stations                              |
| <b>TOTAL COST</b>  |                 |          |               | <b>\$ 31,791,015</b> |  |

Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Bicycle lane to be curb separated from traffic on left
6. Swale not shown, but used only for stormwater estimate

Side-Running B Alternative



|                                 |     |            |       |           |           |
|---------------------------------|-----|------------|-------|-----------|-----------|
| <b>Division Couplet Segment</b> |     |            |       | (feet)    |           |
| Existing Pavement width         |     |            |       | 50        |           |
| Existing Right of Way width     |     |            |       | 100       |           |
| Back of walk to back of walk    |     |            |       | 75        | estimated |
| Existing sidewalk-swale-C&G     |     |            |       | 15        |           |
| <b>Proposed section</b>         |     |            | Lanes |           |           |
|                                 | HMA | 5+2parking |       | 76        |           |
|                                 | PCC | 0          |       | 0         |           |
| C&G                             |     |            |       | 4         |           |
| Curb separated Bicycle lane     |     |            |       | 0         |           |
| Roadside swale - reconstructed  |     |            |       | 8         |           |
| Sidewalk replaced this side     |     |            |       | 5         | one side  |
|                                 |     |            |       | <u>93</u> |           |

Opinion of Project Cost - Planning 0% complete

**COUPLLET - SCENARIO S2**

**DIVISION**

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount           | Notes   |
|--|-----------------|----------|---------------|---------------------|---|
| <b>PREPARATION</b>   |                 |          |               |                     |   |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 44587    | \$ 5          | \$ 222,933          |   |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280     | \$ 20         | \$ 105,600          |   |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 2933     | \$ 20         | \$ 58,667           |   |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 0        | \$ 5          | \$ -                |   |
| <b>GRADING</b>   |                 |          |               |                     |   |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 3080     | \$ 60         | \$ 184,800          |   |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |                     |   |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 0        | \$ 120        | \$ -                |   |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 0        | \$ 225        | \$ -                |   |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |                     |   |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 0        | \$ 2          | \$ -                |   |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 0        | \$ 65         | \$ -                |   |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 323      | \$ 65         | \$ 20,973           |   |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 7617     | \$ 75         | \$ 571,267          |   |
| <b>TRAFFIC</b>   |                 |          |               |                     |   |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -                |   |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280     | \$ 30         | \$ 158,400          |   |
| GENERIC STRIPING, INCL. MARKINGS   | LF              | 5280     | \$ 20         | \$ 105,600          |   |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000           |   |
| <b>OTHER</b>   |                 |          |               |                     |   |
| CEMENT CONCRETE SIDEWALK   | SY              | 2933     | \$ 105        | \$ 308,000          |   |
|  |                 |          |               | \$ -                |   |
|  |                 |          |               | \$ -                |   |
| <b>UTILITIES</b>   |                 |          |               |                     |   |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000          | estimated based on sample mile on Division City GIS |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000           |   |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 4693     | \$ 35         | \$ 164,267          |   |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               | <b>\$ 2,200,507</b> |   |

LENGTH OF SEGMENT (DIVISION) MI 1.4 \$ 3,080,709

**FIXED NUMBER ITEMS**

**STATION**

|  |      |    |            |                      |  |
|--|------|----|------------|----------------------|--|
| TRAFFIC SIGNAL SYSTEM                            | EACH | 7  | \$ 500,000 | \$ 3,500,000         | 7 signalized intersections on Ruby segment premium for two way con |
| MAJOR STATION AT SIGNALIZED INTERSECTION         | EACH | 14 | \$ 250,000 | \$ 3,500,000         | Side station - two per stop  |
| <b>SUB-TOTAL</b>                                 |      |    |            | \$ 10,080,709        |  |
| MOBILIZATION (10%)                               | 10%  |    |            | \$ 1,008,071         |  |
| <b>SUB-TOTAL</b>                                 |      |    |            | \$ 11,088,780        |  |
| PLANNING CONTINGENCY (50%)                       | 50%  |    |            | \$ 5,544,390         |  |
| <b>SUB-TOTAL</b>                                 |      |    |            | \$ 16,633,170        |  |
| <b>PROFESSIONAL SERVICES</b>                     |      |    |            |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW | 8%   |    |            | \$ 1,330,654         |  |
| FINAL DESIGN                                     | 10%  |    |            | \$ 1,663,317         |  |
| PERMITTING                                       | 5%   |    |            | \$ 831,659           |  |
| CONSTRUCTION MANAGEMENT                          | 10%  |    |            | \$ 1,663,317         |  |
| RIGHT OF WAY (5000 SF/STATION)                   | SF   | 0  | \$ 40.00   | \$ -                 | Assume no R/W for right side stations                              |
| <b>TOTAL COST</b>                                |      |    |            | <b>\$ 22,122,117</b> |  |

Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Swale not shown, but used only for stormwater estimate

## Side-Running B Alternative



| Side Right Division segment  |       | (feet) |                  |
|------------------------------|-------|--------|------------------|
| Existing Pavment width       |       | 80     |                  |
| Existing Right of Way width  |       | 100    | estimated avg    |
| Back of walk to back of walk |       | 88     | estimated avg    |
| Existing sidewalk-swale-C&G  |       | 0      |                  |
|                              | Lanes |        |                  |
| Proposed section             | HMA   | 5      | 60               |
|                              | PCC   | 2      | 24               |
| C&G                          |       |        | 4                |
| Curb separated Bicycle lane  |       |        | 0                |
| Roadside swale               |       |        | 8                |
| Cement Conc. Sidewalk        |       |        | 5                |
|                              |       |        | replace one side |
|                              |       |        | 101              |

Opinion of Project Cost - Planning 0% complete

## MAINLINE - SCENARIO S2

Cleveland to the "Y"

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount            | Notes   |
|--|-----------------|----------|---------------|----------------------|---|
| <b>PREPARATION</b>   |                 |          |               |                      |   |
| PLANNING BITUMINOUS PAVEMENT (3" THICK)                                      | SY              | 35200    | \$ 5          | \$ 176,000           |   |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280     | \$ 20         | \$ 105,600           |   |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 2933     | \$ 20         | \$ 58,667            |   |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 10560    | \$ 5          | \$ 52,800            |   |
| <b>GRADING</b>   |                 |          |               | \$ -                 |   |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 10120    | \$ 60         | \$ 607,200           |   |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |                      |   |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 14080    | \$ 120        | \$ 1,689,600         |   |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 4881     | \$ 225        | \$ 1,098,240         |   |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |                      |   |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 14080    | \$ 2          | \$ 28,160            |   |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 7819     | \$ 65         | \$ 508,241           |   |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 323      | \$ 65         | \$ 20,973            |   |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 6013     | \$ 75         | \$ 451,000           |   |
| <b>TRAFFIC</b>   |                 |          |               |                      |   |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -                 | Center turn lane, no curbed channelization          |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280     | \$ 30         | \$ 158,400           | Assume between the curbs                            |
| GENERIC STRIPING, INCL MARKINGS  | LF              | 5280     | \$ 40         | \$ 211,200           |   |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000            |   |
| <b>OTHER</b>   |                 |          |               |                      |   |
| CEMENT CONCRETE SIDEWALK   | SY              | 2933     | \$ 90         | \$ 264,000           |   |
|  |                 |          |               | \$ -                 |   |
|  |                 |          |               | \$ -                 |   |
| <b>UTILITIES</b>   |                 |          |               |                      |   |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000           | estimated based on sample mile on Division City GIS |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000            |   |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 4693     | \$ 35         | \$ 164,267           |   |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               | <b>\$ 5,894,348</b>  |   |
| <b>LENGTH OF SEGMENT CLEVELAND TO Y</b>                                      | MI              | 3.8      |               | <b>\$ 22,398,521</b> |   |

## FIXED NUMBER ITEMS

## STATION

|  |      |     |            |                      |  |
|--|------|-----|------------|----------------------|--|
| TRAFFIC SIGNAL SYSTEM                            | EACH | 14  | \$ 250,000 | \$ 3,500,000         | 14 signalized intersections north of couplet segment |
| MAJOR STATION AT SIGNALIZED INTERSECTION         | EACH | 28  | \$ 250,000 | \$ 7,000,000         | Two side stations per intersection                   |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 32,898,521</b> |  |
| MOBILIZATION (10%)                               |      | 10% |            | \$ 3,289,852         |  |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 36,188,374</b> |  |
| PLANNING CONTINGENCY (50%)                       |      | 50% |            | \$ 18,094,187        |  |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 54,282,560</b> |  |
| <b>PROFESSIONAL SERVICES</b>                     |      |     |            |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW |      | 8%  |            | \$ 4,342,605         |  |
| FINAL DESIGN                                     |      | 10% |            | \$ 5,428,256         |  |
| PERMITTING                                       |      | 5%  |            | \$ 2,714,128         |  |
| CONSTRUCTION MANAGEMENT                          |      | 10% |            | \$ 5,428,256         |  |
| RIGHT OF WAY (5000 SF/STATION)                   | SF   | 0   | \$ 40.00   | \$ -                 | Assume no R/W for right side stations                |
| <b>TOTAL COST</b>                                |      |     |            | <b>\$ 72,195,805</b> |  |

## Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Swale not shown, but used only for stormwater estimate

Side-Running C Alternative



Side-Running C Alternative

|                                | HMA | PCC | Lanes |          |
|--------------------------------|-----|-----|-------|----------|
| Proposed section               |     |     | 3     | 36       |
|                                |     |     | 2     | 12       |
| C&G                            |     |     |       | 4        |
| Curb separated Bicycle lane    |     |     |       | 12       |
| Roadside swale - reconstructed |     |     |       | 10       |
| Sidewalk replaced this side    |     |     |       | 10       |
|                                |     |     |       | <hr/> 84 |

Opinion of Project Cost - Planning 0% complete

COUPLET - SCENARIO S3

RUBY

| Standard Item Description  | Unit of Measure | Qty/MILE  | Unit Price \$ | \$ Amount           | Notes   |
|--|-----------------|-----------|---------------|---------------------|---|
| <b>PREPARATION</b>   |                 |           |               |                     |   |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 21120     | \$ 5          | \$ 105,600          |   |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280      | \$ 20         | \$ 105,600          |   |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 2933      | \$ 20         | \$ 58,667           |   |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 5280      | \$ 5          | \$ 26,400           |   |
| <b>GRADING</b>   |                 |           |               |                     |   |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 11440     | \$ 60         | \$ 686,400          |   |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |           |               |                     |   |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 7040      | \$ 120        | \$ 844,800          |   |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 2441      | \$ 225        | \$ 549,120          |   |
| <b>HOT MIX ASPHALT</b>   |                 |           |               |                     |   |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 7040      | \$ 2          | \$ 14,080           |   |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 1955      | \$ 65         | \$ 127,060          |   |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 645       | \$ 65         | \$ 41,947           |   |
| HMA CL 1/2 IN. PG 70-28, 3 INCH THICK  | TON             | 3608      | \$ 75         | \$ 270,600          |   |
| <b>TRAFFIC</b>   |                 |           |               |                     |   |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0         | \$ 30         | \$ -                |   |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280      | \$ 30         | \$ 158,400          |   |
| GENERIC STRIPING, INCL MARKINGS  | LF              | 5280      | \$ 20         | \$ 105,600          |   |
| TRAFFIC ALLOWANCE  | LS              | 1         | \$ 50,000     | \$ 50,000           |   |
| <b>OTHER</b>   |                 |           |               |                     |   |
| CEMENT CONCRETE SIDEWALK   | SY              | 5867      | \$ 105        | \$ 616,000          |   |
|  |                 |           |               | \$ -                |   |
|  |                 |           |               | \$ -                |   |
| <b>UTILITIES</b>   |                 |           |               |                     |   |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100       | \$ 2,000      | \$ 200,000          | estimated based on sample mile on Division City GIS |
| UTILITY ALLOWANCES   | LS              | 1         | \$ 50,000     | \$ 50,000           |   |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 5867      | \$ 35         | \$ 205,333          |   |
| <b>PER MILE SUB-TOTAL</b>  |                 |           |               | <b>\$ 4,215,607</b> |   |
| <b>LENGTH OF SEGMENT (RUBY)</b>  |                 | <b>MI</b> | <b>1.4</b>    | <b>\$ 5,901,850</b> |   |

FIXED NUMBER ITEMS

STATION

|  |      |     |            |                      |  |
|--|------|-----|------------|----------------------|--|
| TRAFFIC SIGNAL SYSTEM                            | EACH | 7   | \$ 250,000 | \$ 1,750,000         | 7 signalized intersections on Ruby segment |
| MAJOR STATION AT SIGNALIZED INTERSECTION         | EACH | 14  | \$ 250,000 | \$ 3,500,000         | Side station - two per stop                |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 11,151,850</b> |  |
| MOBILIZATION (10 %)                              |      | 10% |            | \$ 1,115,185         |  |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 12,267,035</b> |  |
| PLANNING CONTINGENCY (50%)                       |      | 50% |            | \$ 6,133,517         |  |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 18,400,552</b> |  |
| <b>PROFESSIONAL SERVICES</b>                     |      |     |            |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW |      | 8%  |            | \$ 1,472,044         |  |
| FINAL DESIGN                                     |      | 10% |            | \$ 1,840,055         |  |
| PERMITTING                                       |      | 5%  |            | \$ 920,028           |  |
| CONSTRUCTION MANAGEMENT                          |      | 10% |            | \$ 1,840,055         |  |
| RIGHT OF WAY (5000 SF/STATION)                   | SF   | 0   | \$ 40.00   | \$ -                 | - Assume no R/W for right side stations    |
| <b>TOTAL COST</b>                                |      |     |            | <b>\$ 24,472,734</b> |  |

Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Bicycle lane to be curb separated from traffic on right
6. Swale not shown, but used only for stormwater estimate

Side-Running C Alternative



| Proposed section               | HMA | Lanes | 36        |
|--------------------------------|-----|-------|-----------|
|                                | PCC | 2     | 12        |
| C&G                            |     |       | 4         |
| Curb separated Bicycle lane    |     |       | 0         |
| Roadside swale - reconstructed |     |       | 10        |
| Sidewalk replaced this side    |     |       | 10        |
|                                |     |       | <u>72</u> |

Opinion of Project Cost - Planning 0% complete

COUPLET - SCENARIO S3

DIVISION

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount            | Notes   |
|--|-----------------|----------|---------------|----------------------|---|
| <b>PREPARATION</b>   |                 |          |               |                      |   |
| <b>MOBILIZATION</b>  |                 |          |               |                      |   |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 21120    | \$ 5          | \$ 105,600           |   |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280     | \$ 20         | \$ 105,600           |   |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 5867     | \$ 20         | \$ 117,333           |   |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 5280     | \$ 5          | \$ 26,400            |   |
| <b>GRADING</b>   |                 |          |               |                      |   |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 7920     | \$ 60         | \$ 475,200           |   |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |                      |   |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 7040     | \$ 120        | \$ 844,800           |   |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 2441     | \$ 225        | \$ 549,120           |   |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |                      |   |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 7040     | \$ 2          | \$ 14,080            |   |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 1955     | \$ 65         | \$ 127,060           |   |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 645      | \$ 65         | \$ 41,947            |   |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 3608     | \$ 75         | \$ 270,600           |   |
| <b>TRAFFIC</b>   |                 |          |               |                      |   |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -                 |   |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280     | \$ 30         | \$ 158,400           | Betweencurbs  |
| GENERIC STRIPING, INCL. MARKINGS   | LF              | 5280     | \$ 20         | \$ 105,600           |   |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000            |   |
| <b>OTHER</b>   |                 |          |               |                      |   |
| CEMENT CONCRETE SIDEWALK   | SY              | 5867     | \$ 105        | \$ 616,000           |   |
|  |                 |          |               | \$ -                 |   |
|  |                 |          |               | \$ -                 |   |
| <b>UTILITIES</b>   |                 |          |               |                      |   |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000           | estimated based on sample mile on Division City GIS |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000            |   |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 5867     | \$ 35         | \$ 205,333           |   |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               | <b>\$ 4,063,074</b>  |   |
| <i>LENGTH OF SEGMENT (DIVISION)</i>  |                 | MI       | 1.4           | <b>\$ 5,688,303</b>  |   |
| <b>FIXED NUMBER ITEMS</b>  |                 |          |               |                      |   |
| <b>STATION</b>   |                 |          |               |                      |   |
| TRAFFIC SIGNAL SYSTEM  | EACH            | 7        | \$ 250,000    | \$ 1,750,000         | 7 signalized intersections on Ruby segment          |
| MAJOR STATION AT SIGNALIZED INTERSECTION                                     | EACH            | 14       | \$ 250,000    | \$ 3,500,000         | Side station - two per stop                         |
| <b>SUB-TOTAL</b>   |                 |          |               | <b>\$ 10,938,303</b> |   |
| MOBILIZATION (10%)   | SUB-TOTAL       |          | 10%           | \$ 1,093,830         |   |
| SUB-TOTAL  |                 |          |               | \$ 12,032,133        |   |
| PLANNING CONTINGENCY (50%)   | SUB-TOTAL       |          | 50%           | \$ 6,016,067         |   |
| SUB-TOTAL  |                 |          |               | \$ 18,048,200        |   |
| <b>PROFESSIONAL SERVICES</b>   |                 |          |               |                      |   |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW                             |                 |          | 8%            | \$ 1,443,856         |   |
| FINAL DESIGN   |                 |          | 10%           | \$ 1,804,820         |   |
| PERMITTING   |                 |          | 5%            | \$ 902,410           |   |
| CONSTRUCTION MANAGEMENT  |                 |          | 10%           | \$ 1,804,820         |   |
| RIGHT OF WAY (5000 SF/STATION)   | SF              | 0        | \$ 40.00      | \$ -                 | - Assume no R/W for right side stations             |
| <b>TOTAL COST</b>  |                 |          |               | <b>\$ 24,004,106</b> |   |

Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Swale not shown, but used only for stormwater estimate

Side-Running C Alternative



Side-Running C Alternative

|                                |     |   |            |                  |
|--------------------------------|-----|---|------------|------------------|
| Proposed section               | HMA | 5 | 60         |                  |
|                                | PCC | 2 | 24         |                  |
| C&G                            |     |   | 4          | one side         |
| Curb separated Bicycle lane    |     |   | 0          |                  |
| Roadside swale - reconstructed |     |   | 10         |                  |
| Cement Conc. Sidewalk          |     |   | 5          | replace one side |
|                                |     |   | <u>103</u> |                  |

Opinion of Project Cost - Planning 0% complete

MAINLINE - SCENARIO S3

Cleveland to the "Y"

| Standard Item Description  | Unit of Measure | Qty/MILE | Unit Price \$ | \$ Amount           | Notes   |
|--|-----------------|----------|---------------|---------------------|---|
| <b>PREPARATION</b>   |                 |          |               |                     |   |
| PLANING BITUMINOUS PAVEMENT (3" THICK)                                       | SY              | 35200    | \$ 5          | \$ 176,000          |   |
| REMOVING CEMENT CONC. CURB AND GUTTER  | LF              | 5280     | \$ 20         | \$ 105,600          |   |
| REMOVING CEMENT CONC. SIDEWALK   | SY              | 2933     | \$ 20         | \$ 58,667           |   |
| SAWCUTTING FLEXIBLE PAVEMENT   | LF              | 10560    | \$ 5          | \$ 52,800           |   |
| <b>GRADING</b>   |                 |          |               | \$ -                |   |
| ROADWAY EXCAVATION INCL. HAUL (FOR PCC LANE, SW, AND SWALE)                  | CY              | 9973     | \$ 60         | \$ 598,400          |   |
| <b>CEMENT CONCRETE PAVEMENT</b>  |                 |          |               |                     |   |
| CEMENT CONCRETE PAVEMENT 12.5 INCH THICK                                     | SY              | 14080    | \$ 120        | \$ 1,689,600        |   |
| FURNISHING CONCRETE FOR CEMENT CONCRETE PAVEMENT                             | CY              | 4881     | \$ 225        | \$ 1,098,240        |   |
| <b>HOT MIX ASPHALT</b>   |                 |          |               |                     |   |
| PREPARATION OF UNTREATED ROADWAY   | SY              | 14080    | \$ 2          | \$ 28,160           |   |
| CRUSHED SURFACING TOP COURSE (10" BELOW PCC)                                 | CY              | 3910     | \$ 65         | \$ 254,121          |   |
| CSTC FOR SIDEWALK AND DRIVEWAYS  | CY              | 323      | \$ 65         | \$ 20,973           |   |
| HMA CL. 1/2 IN. PG 70-28, 3 INCH THICK                                       | TON             | 6013     | \$ 75         | \$ 451,000          |   |
| <b>TRAFFIC</b>   |                 |          |               |                     |   |
| CEMENT CONCRETE TRAFFIC CURB   | LF              | 0        | \$ 30         | \$ -                |   |
| CEMENT CONCRETE CURB AND GUTTER  | LF              | 5280     | \$ 30         | \$ 158,400          | Assume between the curbs                            |
| GENERIC STRIPING, INCL MARKINGS  | LF              | 5280     | \$ 40         | \$ 211,200          |   |
| TRAFFIC ALLOWANCE  | LS              | 1        | \$ 50,000     | \$ 50,000           |   |
| <b>OTHER</b>   |                 |          |               |                     |   |
| CEMENT CONCRETE SIDEWALK   | SY              | 2933     | \$ 105        | \$ 308,000          |   |
|  |                 |          |               | \$ -                |   |
|  |                 |          |               | \$ -                |   |
| <b>UTILITIES</b>   |                 |          |               |                     |   |
| ADJUST MANHOLE (INCLUDES DRAINAGE STRUCTURE, VALVE BOX)                      | EACH            | 100      | \$ 2,000      | \$ 200,000          | estimated based on sample mile on Division City GIS |
| UTILITY ALLOWANCES   | LS              | 1        | \$ 50,000     | \$ 50,000           |   |
| STORMWATER ALLOWANCE (Based on Swale construction which may not be feasible) | SY              | 5867     | \$ 35         | \$ 205,333          |   |
| <b>PER MILE SUB-TOTAL</b>  |                 |          |               | <b>\$ 5,716,494</b> |   |

LENGTH OF SEGMENT CLEVELAND TO "Y" MI 3.8 \$ 21,722,677

STATION

|  |      |     |            |                      |  |
|--|------|-----|------------|----------------------|--|
| TRAFFIC SIGNAL SYSTEM                            | EACH | 14  | \$ 250,000 | \$ 3,500,000         | 14 signalized intersections north of couplet segment |
| MAJOR STATION AT SIGNALIZED INTERSECTION         | EACH | 28  | \$ 250,000 | \$ 7,000,000         | Two side stations per intersection                   |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 32,222,677</b> |  |
| MOBILIZATION (10%)                               |      | 10% |            | \$ 3,222,268         |  |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 35,444,944</b> |  |
| PLANNING CONTINGENCY (50%)                       |      | 50% |            | \$ 17,722,472        |  |
| <b>SUB-TOTAL</b>                                 |      |     |            | <b>\$ 53,167,417</b> |  |
| <b>PROFESSIONAL SERVICES</b>                     |      |     |            |                      |  |
| PRELIMINARY ENGINEERING AND ENVIRONMENTAL REVIEW |      | 8%  |            | \$ 4,253,393         |  |
| FINAL DESIGN                                     |      | 10% |            | \$ 5,316,742         |  |
| PERMITTING                                       |      | 5%  |            | \$ 2,658,371         |  |
| CONSTRUCTION MANAGEMENT                          |      | 10% |            | \$ 5,316,742         |  |
| RIGHT OF WAY (5000 SF/STATION)                   | SF   | 0   | \$ 40.00   | \$ -                 | Assume no R/W for right side stations                |
| <b>TOTAL COST</b>                                |      |     |            | <b>\$ 70,712,664</b> |  |

Assumptions:

1. Curb, gutter & sidewalk - swale on one side will be preserved.
2. Other side C&G will be removed and replaced at wider limit.
3. Pavement section is suitable for grind and overlay for vehicle lanes
4. Bus (BST) lanes to be reconstructed with PCC pavement. Assume 12.5" PCC over 10" CSBC
5. Swale not shown, but used only for stormwater estimate