

# Technical Memorandum

January 17, 2022

Project# 13757.021

To: Gus Burrell, City Administrator  
City of Madras

From: Matt Kittelson, PE and Jacki Gulczynski, PE

CC: Jeff Hurd, Public Works Director

RE: Jefferson County/Madras Transportation  
Equity Project

## PROJECT INTRODUCTION AND PURPOSE

This memorandum summarizes roadway improvement concepts and cost estimates developed for the H Street, Culver Highway, and J Street corridors in Madras. The purpose of these concepts is to clearly define planned improvements and funds needed to implement those improvements.

Once complete, the projects presented herein will provide an improved route parallel to US 97 that will reduce reliance on that highway by providing an expanded local roadway system that connects to improved intersections at J Street and US 97. The projects are consistent with the Madras Transportation System Plan (TSP), which strives to improve local connectivity within south Madras.

## PROJECT LOCATIONS AND BACKGROUND

Figure 1 shows a summary of the improvements planned, potential project improvement packages, and planning level cost estimates for each phase.

As presented, Phase 1: Option 1 would:

- *Construct turn lane improvements at Hall Road/Culver Highway*
- *Construct turn lane improvements at J Street/Culver Highway*
- Complete Hall Road extension between US 97 and Culver Highway.
- Construct an enhanced pedestrian crossing at H Street/Culver Highway
- Install traffic signals at J Street/US 97 Couplet

Alternatively, improvements at Hall Road/Culver Highway and J Street/Culver Highway (*shown in bold and italics*) could be modified to construct their preferred configuration as roundabouts if available funds allow. This would increase the cost of Phase 1 but reduce the overall improvement costs by avoiding rework at these key intersections. These improvements are shown as Phase 1: Option 2:

- *Construct a single lane roundabout at Hall Road/Culver Highway*
- *Construct a single lane roundabout at J Street/Belmont Lane/Culver Highway*

Phase 2 would:

- Construct a local road between Hall Road and Bi-Mart

Similar to Phase 1, Option 2 improvements, Phase 2 improvements could be constructed sooner if available funding allow.

Each improvement, including planning background and purpose, is discussed further below:

- Hall Road Extension between US 97 and Culver Highway
  - Identified connection in TSP
  - Key road to serve priority development area between US 97 and Culver Highway
  - East-west connection provides access to Culver Highway and reduces reliance on US 97
- Hall Road/Culver Highway Intersection
  - Need for intersection improvement identified in the TSP
  - Intersection form (side-street stop-controlled or roundabout) to be determined based on capacity needs.
- H Street/Culver Highway Intersection
  - Need for an enhanced pedestrian crossing is currently under evaluation by the City of Madras and ODOT.
  - Improved walking connection would connect new development to the west with services and amenities to the east.
- J Street/Belmont Lane/Culver Highway
  - Need for intersection improvement identified in the TSP
  - City conducted an intersection evaluation to determine interim and long-term improvement options based on future growth. Near-term option would construct a side-street stop-controlled intersection with turn-lanes. Long-term option would construct a single-lane roundabout.
- US97/J Street Signals
  - Need for traffic signal at these intersections included in the TSP.
  - Capacity enhancement would provide improved access to US 97 by those utilizing Culver Highway as a parallel route for north-south travel.
  - Further coordination with US97 Pavement Rehab project (Earl to Colfax) will be necessary. Specifically, the ongoing ODOT project is expected to provide modifications to the intersections, including ADA ramp upgrades.
  - Both intersections meet traffic signal warrants (shown in Appendix B) based on volumes and population
- Hall Road to Bi-Mart Local Access
  - Provides local access route to key economic area
  - Reduces reliance on state highway

Note: Several projects within this concept plan are identified on or along ODOT facilities. It is important to note that in all such cases further coordination with ODOT will be required, including refinement of design elements through preliminary and final design processes, and are subject to future ODOT approvals by the State Roadway-Traffic Engineer, pursuant with the ODOT Traffic Manual. In addition, any roundabouts considered along ODOT facilities are subject to Highway Directive DES-02, which will require additional coordination and documentation with the trucking industry at multiple steps throughout the planning, design, and construction of such facilities.

## COST ESTIMATE ASSUMPTIONS

The project team worked closely with the City of Madras to develop representative Class 5 planning level cost estimates for the concept plan projects. Cost estimates include:

- Right-of-way cost assumptions based on Real Market Value<sup>1</sup> and assumed flat rate for developing an ODOT ROW application (\$15,000)
- Utility relocation costs

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<sup>1</sup> Based on County Assessor's office

- Assumed 25% Engineering and Construction Management cost
- General 30% contingency factor cost
- Assumption of full depth construction of intersection improvement (i.e. full reconstruction)

Cost estimates are reflected in Figure 1. Documentation spreadsheets are included in Appendix C

## NEXT STEPS






The content within this document is intended to provide planning level cost estimates and concepts for local network improvements in South Madras to improve circulation and reduce US 97 reliance. With this information the City of Madras will work with local partners to identify possible funding sources for project implementation. As each project moves forward, the City should continue to work with ODOT and other stakeholders to refine design concepts and coordinate with applicable standards.

# SOUTH MADRAS CONNECTIVITY INFRASTRUCTURE IMPROVEMENTS - COST ESTIMATES AND PHASING



## Legend

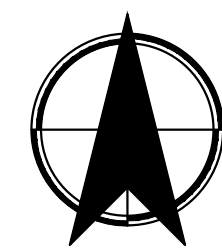
Phase 1 Option 1: \$6.3M  
 Phase 1 Option 2: \$10.7M  
 Phase 2: \$400K

-  Construct Stop Controlled Intersection Improvements
-  Construct Roundabout
-  Install Traffic Signal
-  Construct Roadway
-  Construct Enhanced Pedestrian Crossing

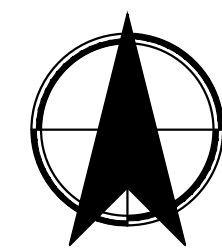


SE Wood 2000 ft

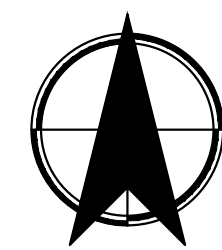
Appendix A  
Concept Figures



Scale: 1" = 100'  
100 50 0 100



Scale: 1" = 100'  
100 50 0 100

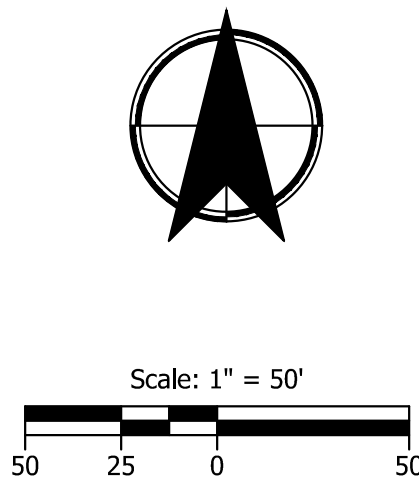


Scale: 1" = 100'  
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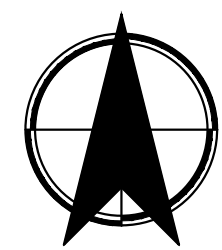
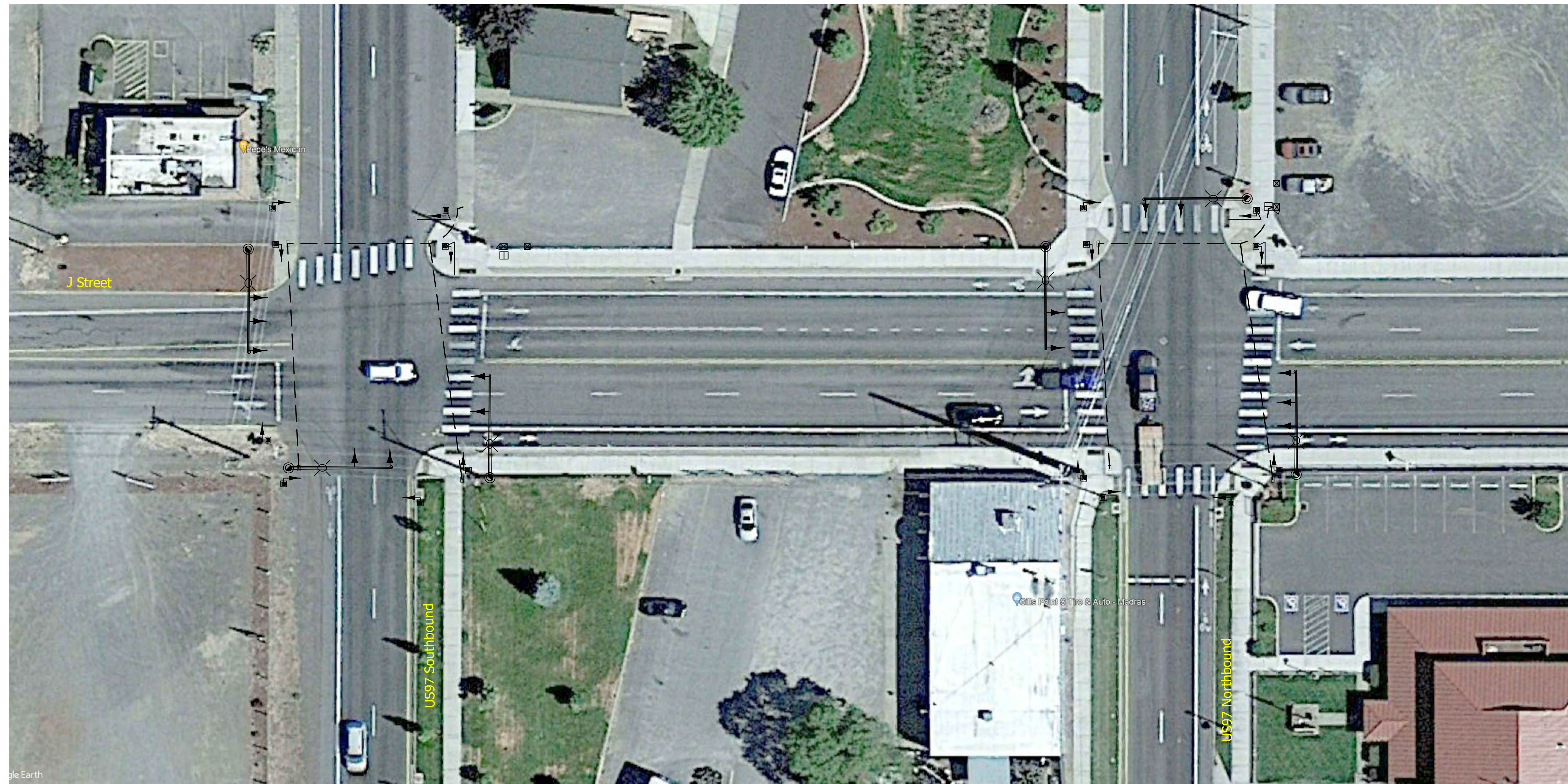




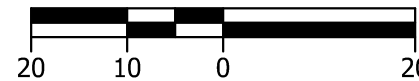
## Culver Hwy/Belmont Lane/J Street Stop Controlled Madras, OR



H:\131377 - Madras Planning On-Call\021 - Culver Hwy and J Street Cost Estimate\design\_XenPR\_CONCEPT\_MAP\_recover.dwg Dec 16, 2021 4:28pm jgulczynski Layout Tab Culver-Belmont RBT



Scale: 1" = 20'





Hall Road/Bimart Local Access Road  
Madras, OR

Appendix B  
Signal Warrant Analysis

## Signal Warrant Assessment

Based on 2009 Edition of the MUTCD

Project #: 13757.021  
 Project Name: US97 J Street Cost Estimates  
 Analyst: JXG  
 Date: 12/16/2021  
 Intersection: US97 NB/J Street  
 Scenario: 2021 Existing

Volume Adjustment Factor = 1.0  
 North-South Approach = Major  
 East-West Approach = Minor  
 Major Street Thru Lanes = 2  
 Minor Street Thru Lanes = 1  
 Speed > 40 mph? No  
 Population < 10,000? Yes  
 Warrant Factor 70%  
 Peak Hour or Daily Count? Daily

### Warrant Summary

| Warrant | Name          | Analyzed? | Met? |
|---------|---------------|-----------|------|
| #1      | Eight-Highest | Yes       | Yes  |
| #2      | Four-Hour     | Yes       | Yes  |
| #3      | Peak Hour     | Yes       | Yes  |

*\*This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.*

| Hour     |          | Traffic Volumes |    |              |     | Hourly Rank |
|----------|----------|-----------------|----|--------------|-----|-------------|
| Begin    | End      | Major Street    |    | Minor Street |     |             |
|          |          | NB              | SB | EB           | WB  |             |
| 12:00 AM | 1:00 AM  | 0               |    |              |     | 17          |
| 1:00 AM  | 2:00 AM  | 0               |    |              |     | 17          |
| 2:00 AM  | 3:00 AM  | 0               |    |              |     | 17          |
| 3:00 AM  | 4:00 AM  | 0               |    |              |     | 17          |
| 4:00 AM  | 5:00 AM  | 0               |    |              |     | 17          |
| 5:00 AM  | 6:00 AM  | 243             |    | 25           | 49  | 16          |
| 6:00 AM  | 7:00 AM  | 397             |    | 36           | 75  | 14          |
| 7:00 AM  | 8:00 AM  | 678             |    | 156          | 159 | 8           |
| 8:00 AM  | 9:00 AM  | 607             |    | 83           | 83  | 12          |
| 9:00 AM  | 10:00 AM | 627             |    | 103          | 97  | 11          |
| 10:00 AM | 11:00 AM | 678             |    | 82           | 89  | 9           |
| 11:00 AM | 12:00 PM | 800             |    | 112          | 109 | 7           |
| 12:00 PM | 1:00 PM  | 776             |    | 140          | 130 | 6           |
| 1:00 PM  | 2:00 PM  | 808             |    | 133          | 105 | 4           |
| 2:00 PM  | 3:00 PM  | 765             |    | 157          | 97  | 5           |
| 3:00 PM  | 4:00 PM  | 875             |    | 148          | 165 | 2           |
| 4:00 PM  | 5:00 PM  | 911             |    | 174          | 146 | 1           |
| 5:00 PM  | 6:00 PM  | 813             |    | 164          | 144 | 3           |
| 6:00 PM  | 7:00 PM  | 625             |    | 89           | 113 | 10          |
| 7:00 PM  | 8:00 PM  | 415             |    | 80           | 54  | 13          |
| 8:00 PM  | 9:00 PM  | 335             |    | 60           | 25  | 15          |
| 9:00 PM  | 10:00 PM | 0               |    |              |     | 17          |
| 10:00 PM | 11:00 PM | 0               |    |              |     | 17          |
| 11:00 PM | 12:00 AM | 0               |    |              |     | 17          |

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| Hour     |          | Traffic Volumes |    |              |     | Hourly Rank |
|----------|----------|-----------------|----|--------------|-----|-------------|
| Begin    | End      | Major Street    |    | Minor Street |     |             |
|          |          | NB              | SB | EB           | WB  |             |
| 12:00 AM | 1:00 AM  | 0               |    |              |     | 17          |
| 1:00 AM  | 2:00 AM  | 0               |    |              |     | 17          |
| 2:00 AM  | 3:00 AM  | 0               |    |              |     | 17          |
| 3:00 AM  | 4:00 AM  | 0               |    |              |     | 17          |
| 4:00 AM  | 5:00 AM  | 0               |    |              |     | 17          |
| 5:00 AM  | 6:00 AM  | 220             |    | 40           | 8   | 16          |
| 6:00 AM  | 7:00 AM  | 309             |    | 34           | 13  | 15          |
| 7:00 AM  | 8:00 AM  | 479             |    | 145          | 51  | 11          |
| 8:00 AM  | 9:00 AM  | 495             |    | 69           | 18  | 12          |
| 9:00 AM  | 10:00 AM | 673             |    | 84           | 17  | 10          |
| 10:00 AM | 11:00 AM | 708             |    | 71           | 14  | 9           |
| 11:00 AM | 12:00 PM | 826             |    | 111          | 40  | 7           |
| 12:00 PM | 1:00 PM  | 903             |    | 104          | 309 | 3           |
| 1:00 PM  | 2:00 PM  | 896             |    | 110          | 35  | 6           |
| 2:00 PM  | 3:00 PM  | 912             |    | 118          | 30  | 5           |
| 3:00 PM  | 4:00 PM  | 1188            |    | 97           | 64  | 1           |
| 4:00 PM  | 5:00 PM  | 1123            |    | 111          | 62  | 2           |
| 5:00 PM  | 6:00 PM  | 994             |    | 113          | 52  | 4           |
| 6:00 PM  | 7:00 PM  | 715             |    | 71           | 40  | 8           |
| 7:00 PM  | 8:00 PM  | 475             |    | 64           | 23  | 13          |
| 8:00 PM  | 9:00 PM  | 376             |    | 31           | 14  | 14          |
| 9:00 PM  | 10:00 PM | 0               |    |              |     | 17          |
| 10:00 PM | 11:00 PM | 0               |    |              |     | 17          |
| 11:00 PM | 12:00 AM | 0               |    |              |     | 17          |

Data Input

Appendix C  
Cost Estimate Worksheets



**Madras Planning On-Call**  
**Hal Road Extension Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

| Prepared By: Daniel Bowers                             |      |                | Date: December 2, 2021                    |              |                  |
|--|------|----------------|---|--------------|------------------|
| Reviewed By: Darren Hippenstiel                        |      |                |   |              |                  |
| This Estimate has a Rating of:                         |      |                | <b>3C</b> (See rating scale guide below.) |              |                  |
| ITEM   | UNIT | TOTAL QUANTITY | UNIT PRICE                                | TOTAL COST   |                  |
| Mobilization   | LS   | ALL            | \$93,000.00                               | \$93,000.00  |                  |
| Traffic Control  | LS   | ALL            | \$48,000.00                               | \$48,000.00  |                  |
| Erosion Control  | LS   | ALL            | \$14,000.00                               | \$14,000.00  |                  |
| Removal of Structures and Obstructions                 | LS   | ALL            | \$21,000.00                               | \$21,000.00  |                  |
| Clearing and Grubbing                                  | LS   | ALL            | \$18,000.00                               | \$18,000.00  |                  |
| General Earthworks                                     | CY   | 3,600          | \$25.00                                   | \$90,000.00  |                  |
| Asphalt Roadway - Full Depth                           | SF   | 38,615         | \$8.70                                    | \$335,950.50 |                  |
| Subgrade Geotextile                                    | SY   | 4,291          | \$1.00                                    | \$4,291.00   |                  |
| Concrete Curbs - Standard Curb & Gutter                | LF   | 1,563          | \$30.90                                   | \$48,298.86  |                  |
| Concrete Walks   | SF   | 9,378          | \$7.90                                    | \$74,089.52  |                  |
| Detectable Warnings                                    | EA   | 4              | \$500.00                                  | \$2,000.00   |                  |
| Extra for Pedestrian Ramps                             | EA   | 4              | \$1,000.00                                | \$4,000.00   |                  |
| Storm Water System & Water Quality Treatment, Complete | LS   | ALL            | \$196,000.00                              | \$196,000.00 |                  |
| Permanent Landscaping                                  | SF   | 8,597          | \$3.70                                    | \$31,808.47  |                  |
| Irrigation, Complete                                   | SF   | 8,597          | \$2.50                                    | \$21,492.21  |                  |
| Pavement Markings, Complete                            | LS   | ALL            | \$12,000.00                               | \$12,000.00  |                  |
| Signage, Complete                                      | LS   | ALL            | \$9,000.00                                | \$9,000.00   |                  |
| North Unit Canal Pipe Relocation                       | LS   | ALL            | \$60,000.00                               | \$60,000.00  |                  |
| <b>TOTAL CONSTRUCTION COST</b>                         |      |                |   | <b>\$</b>    | <b>1,082,931</b> |
| <b>ENGINEERING SUPPORT</b>                             |      |                |   |              |                  |
| Engineering & Construction Management                  | LS   | ALL            | \$271,000.00                              | \$271,000.00 |                  |
| <b>ENGINEERING SUPPORT SUBTOTAL</b>                    |      |                |   | <b>\$</b>    | <b>271,000</b>   |
| <b>ADDITIONAL COSTS</b>                                |      |                |   |              |                  |
| Right-Of-Way   | LS   | ALL            | \$0.00                                    | \$0.00       |                  |
| Utility Relocation                                     | LS   | ALL            | \$75,000.00                               | \$75,000.00  |                  |
| <b>ADDITIONAL COST SUBTOTAL</b>                        |      |                |   | <b>\$</b>    | <b>75,000</b>    |
| <b>TOTAL PROJECT SUBTOTAL</b>                          |      |                |   | <b>\$</b>    | <b>1,428,931</b> |
| <b>30% Contingency</b>                                 |      |                |   | <b>\$</b>    | <b>428,680</b>   |
| <b>TOTAL ESTIMATED PROJECT COST</b>                    |      |                |   | <b>\$</b>    | <b>1,857,611</b> |

**Assumptions:**

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

**Madras Planning On-Call**  
**Culver Hwy and Hall Rd Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

Prepared By: Daniel Bowers Date: December 2, 2021

Reviewed By: Darren Hippenstiel

This Estimate has a Rating of: **3C** (See rating scale guide below.)

| ITEM   | UNIT | TOTAL QUANTITY | UNIT PRICE   | TOTAL COST          |
|--|------|----------------|--------------|---------------------|
| Mobilization   | LS   | ALL            | \$81,000.00  | \$81,000.00         |
| Traffic Control  | LS   | ALL            | \$41,000.00  | \$41,000.00         |
| Erosion Control  | LS   | ALL            | \$9,000.00   | \$9,000.00          |
| Removal of Structures and Obstructions                 | LS   | ALL            | \$18,000.00  | \$18,000.00         |
| Clearing and Grubbing                                  | LS   | ALL            | \$16,000.00  | \$16,000.00         |
| General Earthworks                                     | CY   | 2,181          | \$25.00      | \$54,525.81         |
| Asphalt Roadway - Full Depth                           | SF   | 9,223          | \$8.70       | \$80,243.23         |
| Asphalt Roadway - Grind & Inlay (2" Depth)             | SF   | 78,067         | \$4.10       | \$320,075.60        |
| Subgrade Geotextile                                    | SY   | 1,025          | \$1.00       | \$1,025.00          |
| Concrete Curbs - Standard Curb & Gutter                | LF   | 395            | \$30.90      | \$12,214.46         |
| Concrete Walks   | SF   | 2,372          | \$7.90       | \$18,736.75         |
| Detectable Warnings                                    | EA   | 6              | \$500.00     | \$3,000.00          |
| Extra for Pedestrian Ramps                             | EA   | 6              | \$1,000.00   | \$6,000.00          |
| Storm Water System & Water Quality Treatment, Complete | LS   | ALL            | \$174,000.00 | \$174,000.00        |
| Permanent Landscaping                                  | SF   | 2,174          | \$3.70       | \$8,044.15          |
| Irrigation, Complete                                   | SF   | 2,174          | \$2.50       | \$5,435.24          |
| Pavement Markings, Complete                            | LS   | ALL            | \$10,000.00  | \$10,000.00         |
| Signage, Complete                                      | LS   | ALL            | \$8,000.00   | \$8,000.00          |
| Illumination System, Complete                          | LS   | ALL            | \$69,500.00  | \$69,500.00         |
| <b>TOTAL CONSTRUCTION COST</b>                         |      |                |              | <b>\$ 935,800</b>   |
| <b>ENGINEERING SUPPORT</b>                             |      |                |              |                     |
| Engineering & Construction Management                  | LS   | ALL            | \$234,000.00 | \$234,000.00        |
| <b>ENGINEERING SUPPORT SUBTOTAL</b>                    |      |                |              | <b>\$ 234,000</b>   |
| <b>ADDITIONAL COSTS</b>                                |      |                |              |                     |
| Right-Of-Way   | LS   | ALL            | \$0.00       | \$0.00              |
| Utility Relocation                                     | LS   | ALL            | \$75,000.00  | \$75,000.00         |
| <b>ADDITIONAL COST SUBTOTAL</b>                        |      |                |              | <b>\$ 75,000</b>    |
| <b>TOTAL PROJECT SUBTOTAL</b>                          |      |                |              | <b>\$ 1,244,800</b> |
| <b>30% Contingency</b>                                 |      |                |              | <b>\$ 373,450</b>   |
| <b>TOTAL ESTIMATED PROJECT COST</b>                    |      |                |              | <b>\$ 1,618,250</b> |

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

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**Madras Planning On-Call**  
**Culver Hwy/Belmont Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

Prepared By: Daniel Bowers Date: December 2, 2021

Reviewed By: Darren Hippenstiel

This Estimate has a Rating of: **3C** (See rating scale guide below.)

| ITEM   | UNIT | TOTAL QUANTITY | UNIT PRICE   | TOTAL COST       |
|--|------|----------------|--------------|------------------|
| Mobilization   | LS   | ALL            | \$204,000.00 | \$204,000.00     |
| Traffic Control  | LS   | ALL            | \$103,000.00 | \$103,000.00     |
| Erosion Control  | LS   | ALL            | \$23,000.00  | \$23,000.00      |
| Removal of Structures and Obstructions                 | LS   | ALL            | \$44,000.00  | \$44,000.00      |
| Clearing and Grubbing                                  | LS   | ALL            | \$39,000.00  | \$39,000.00      |
| General Earthworks                                     | CY   | 5,900          | \$25.00      | \$147,500.00     |
| Asphalt Roadway - Full Depth                           | SF   | 62,219         | \$8.70       | \$541,303.39     |
| Subgrade Geotextile                                    | SY   | 6,914          | \$1.00       | \$6,914.00       |
| Concrete Curbs - Standard Curb                         | LF   | 3,026          | \$25.50      | \$77,167.85      |
| Raised Concrete Island                                 | SF   | 14,866         | \$10.90      | \$162,039.51     |
| Truck Apron (Concrete)                                 | SF   | 4,477          | \$16.70      | \$74,762.06      |
| Concrete Walks   | SF   | 18,311         | \$7.90       | \$144,656.82     |
| Detectable Warnings                                    | EA   | 16             | \$500.00     | \$8,000.00       |
| Pedestrian Ramps                                       | EA   | 8              | \$5,000.00   | \$40,000.00      |
| Bike Ramps   | EA   | 8              | \$2,500.00   | \$20,000.00      |
| Storm Water System & Water Quality Treatment, Complete | LS   | ALL            | \$428,000.00 | \$428,000.00     |
| Permanent Landscaping                                  | SF   | 13,187         | \$3.70       | \$48,790.27      |
| Irrigation, Complete                                   | SF   | 13,187         | \$2.50       | \$32,966.40      |
| Pavement Markings, Complete                            | LS   | ALL            | \$25,000.00  | \$25,000.00      |
| Signage, Complete                                      | LS   | ALL            | \$19,000.00  | \$19,000.00      |
| Illumination System, Complete                          | LS   | ALL            | \$172,000.00 | \$172,000.00     |
| <b>TOTAL CONSTRUCTION COST \$</b>                      |      |                |              | <b>2,361,100</b> |
| <b>ENGINEERING SUPPORT</b>                             |      |                |              |                  |
| Engineering & Construction Management                  | LS   | ALL            | \$591,000.00 | \$591,000.00     |
| <b>ENGINEERING SUPPORT SUBTOTAL \$</b>                 |      |                |              | <b>591,000</b>   |
| <b>ENGINEERING PERMITS</b>                             |      |                |              |                  |
| Right-Of-Way   | LS   | ALL            | \$22,000.00  | \$22,000.00      |
| Utility Relocation                                     | LS   | ALL            | \$75,000.00  | \$75,000.00      |
| <b>ENGINEERING PERMITS SUBTOTAL \$</b>                 |      |                |              | <b>97,000</b>    |
| <b>TOTAL PROJECT SUBTOTAL \$</b>                       |      |                |              | <b>2,952,100</b> |
| <b>30% Contingency \$</b>                              |      |                |              | <b>885,640</b>   |
| <b>TOTAL ESTIMATED PROJECT COST \$</b>                 |      |                |              | <b>3,837,740</b> |

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

**Madras Planning On-Call**  
**Culver Hwy/Belmont Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

Prepared By: Daniel Bowers Date: December 2, 2021

Reviewed By: Darren Hippenstiel

This Estimate has a Rating of: **3C** (See rating scale guide below.)

| ITEM   | UNIT | TOTAL QUANTITY | UNIT PRICE   | TOTAL COST          |
|--|------|----------------|--------------|---------------------|
| Mobilization   | LS   | ALL            | \$86,000.00  | \$86,000.00         |
| Traffic Control  | LS   | ALL            | \$44,000.00  | \$44,000.00         |
| Erosion Control  | LS   | ALL            | \$9,000.00   | \$9,000.00          |
| Removal of Structures and Obstructions                 | LS   | ALL            | \$19,000.00  | \$19,000.00         |
| Clearing and Grubbing                                  | LS   | ALL            | \$17,000.00  | \$17,000.00         |
| General Earthworks                                     | CY   | 2,300          | \$25.00      | \$57,500.00         |
| Asphalt Roadway - Full Depth                           | SF   | 20,436         | \$8.70       | \$177,793.64        |
| Asphalt Roadway - Grind & Inlay (2" Depth)             | SF   | 36,125         | \$4.10       | \$148,111.11        |
| Subgrade Geotextile                                    | SY   | 2,271          | \$1.00       | \$2,271.00          |
| Concrete Curbs - Standard Curb                         | LF   | 2,047          | \$25.50      | \$52,200.54         |
| Raised Concrete Island                                 | SF   | 425            | \$10.90      | \$4,629.23          |
| Concrete Walks   | SF   | 12,148         | \$7.90       | \$95,972.99         |
| Detectable Warnings                                    | EA   | 10             | \$500.00     | \$5,000.00          |
| Extra for Pedestrian Ramps                             | EA   | 10             | \$1,000.00   | \$10,000.00         |
| Storm Water System & Water Quality Treatment, Complete | LS   | ALL            | \$111,000.00 | \$111,000.00        |
| Permanent Landscaping                                  | SF   | 8,623          | \$3.70       | \$31,904.95         |
| Irrigation, Complete                                   | SF   | 8,623          | \$2.50       | \$21,557.40         |
| Pavement Markings, Complete                            | LS   | ALL            | \$12,000.00  | \$12,000.00         |
| Signage, Complete                                      | LS   | ALL            | \$9,000.00   | \$9,000.00          |
| Illumination System, Complete                          | LS   | ALL            | \$77,500.00  | \$77,500.00         |
| <b>TOTAL CONSTRUCTION COST</b>                         |      |                |              | <b>\$ 991,441</b>   |
| <b>ENGINEERING SUPPORT</b>                             |      |                |              |                     |
| Engineering & Construction Management                  | LS   | ALL            | \$248,000.00 | \$248,000.00        |
| <b>ENGINEERING SUPPORT SUBTOTAL</b>                    |      |                |              | <b>\$ 248,000</b>   |
| <b>ADDITIONAL COSTS</b>                                |      |                |              |                     |
| Right-Of-Way   | LS   | ALL            | \$105,000.00 | \$105,000.00        |
| Utility Relocation                                     | LS   | ALL            | \$150,000.00 | \$150,000.00        |
| <b>ADDITIONAL COST SUBTOTAL</b>                        |      |                |              | <b>\$ 255,000</b>   |
| <b>TOTAL PROJECT SUBTOTAL</b>                          |      |                |              | <b>\$ 1,494,441</b> |
| <b>30% Contingency</b>                                 |      |                |              | <b>\$ 448,340</b>   |
| <b>TOTAL ESTIMATED PROJECT COST</b>                    |      |                |              | <b>\$ 1,942,781</b> |

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

**Madras Planning On-Call**  
**Culver Hwy/Belmont Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

| Prepared By: Daniel Bowers                             |      |                | Date: December 2, 2021                    |                     |
|--|------|----------------|---|---------------------|
| Reviewed By: Darren Hippenstiel                        |      |                |   |                     |
| This Estimate has a Rating of:                         |      |                | <b>3C</b> (See rating scale guide below.) |                     |
| ITEM   | UNIT | TOTAL QUANTITY | UNIT PRICE                                | TOTAL COST          |
| Mobilization   | LS   | ALL            | \$196,000.00                              | \$196,000.00        |
| Traffic Control  | LS   | ALL            | \$100,000.00                              | \$100,000.00        |
| Erosion Control  | LS   | ALL            | \$22,000.00                               | \$22,000.00         |
| Removal of Structures and Obstructions                 | LS   | ALL            | \$43,000.00                               | \$43,000.00         |
| Clearing and Grubbing                                  | LS   | ALL            | \$38,000.00                               | \$38,000.00         |
| General Earthworks                                     | CY   | 5,700          | \$25.00                                   | \$142,500.00        |
| Asphalt Roadway - Full Depth                           | SF   | 58,500         | \$8.70                                    | \$508,950.00        |
| Subgrade Geotextile                                    | SY   | 6,500          | \$1.00                                    | \$6,500.00          |
| Concrete Curbs - Standard Curb                         | LF   | 2,946          | \$25.50                                   | \$75,134.48         |
| Raised Concrete Island                                 | SF   | 11,405         | \$10.90                                   | \$124,312.54        |
| Truck Apron (Concrete)                                 | SF   | 6,600          | \$16.70                                   | \$110,220.00        |
| Concrete Walks   | SF   | 20,185         | \$7.90                                    | \$159,458.18        |
| Detectable Warnings                                    | EA   | 16             | \$500.00                                  | \$8,000.00          |
| Pedestrian Ramps                                       | EA   | 8              | \$5,000.00                                | \$40,000.00         |
| Bike Ramps   | EA   | 8              | \$2,500.00                                | \$20,000.00         |
| Storm Water System & Water Quality Treatment, Complete | LS   | ALL            | \$419,000.00                              | \$419,000.00        |
| Permanent Landscaping                                  | SF   | 7,975          | \$3.70                                    | \$29,506.69         |
| Irrigation, Complete                                   | SF   | 7,975          | \$2.50                                    | \$19,936.95         |
| Pavement Markings, Complete                            | LS   | ALL            | \$25,000.00                               | \$25,000.00         |
| Signage, Complete                                      | LS   | ALL            | \$19,000.00                               | \$19,000.00         |
| Illumination System, Complete                          | LS   | ALL            | \$169,600.00                              | \$169,600.00        |
| <b>TOTAL CONSTRUCTION COST</b>                         |      |                |   | <b>\$ 2,276,119</b> |
| <b>ENGINEERING SUPPORT</b>                             |      |                |   |                     |
| Engineering & Construction Management                  | LS   | ALL            | \$570,000.00                              | \$570,000.00        |
| <b>ENGINEERING SUPPORT SUBTOTAL</b>                    |      |                |   | <b>\$ 570,000</b>   |
| <b>ADDITIONAL COSTS</b>                                |      |                |   |                     |
| Right-Of-Way   | LS   | ALL            | \$153,000.00                              | \$153,000.00        |
| Utility Relocation                                     | LS   | ALL            | \$150,000.00                              | \$150,000.00        |
| <b>ADDITIONAL COST SUBTOTAL</b>                        |      |                |   | <b>\$ 303,000</b>   |
| <b>TOTAL PROJECT SUBTOTAL</b>                          |      |                |   | <b>\$ 3,149,119</b> |
| <b>30% Contingency</b>                                 |      |                |   | <b>\$ 944,740</b>   |
| <b>TOTAL ESTIMATED PROJECT COST</b>                    |      |                |   | <b>\$ 4,093,859</b> |

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

**Madras Planning On-Call**  
**US97 and J Street Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

| Prepared By: Ryan McFadden   |      | Date: December 2, 2021                    |              |                  |
|--|------|---|--------------|------------------|
| Reviewed By: Darren Hippenstiel  |      |   |              |                  |
| This Estimate has a Rating of:   |      | <b>3C</b> (See rating scale guide below.) |              |                  |
| ITEM   | UNIT | TOTAL QUANTITY                            | UNIT PRICE   | TOTAL COST       |
| ODOT Mast Arm Pole (SM4L) with <u>40' arm</u> + Luminaire Arm + Anchor Bolts | EA   | 3   | \$ 24,321.00 | \$ 72,963.00     |
| Signal Pole Foundation (ODOT)  | EA   | 3   | \$ 10,000.00 | \$ 30,000.00     |
| Pedestrian Pedestal + Foundation   | EA   | 8   | \$ 1,069.00  | \$ 8,552.00      |
| 332 Cabinet + Foundation + 2070E Controller                                  | EA   | 1   | \$ 15,000.00 | \$ 15,000.00     |
| Service + Cabinet + Foundation (BMCL)  | EA   | 1   | \$ 5,000.00  | \$ 5,000.00      |
| Standard Vehicle Signal Display (3-section)                                  | EA   | 6   | \$ 750.00    | \$ 4,500.00      |
| Standard Vehicle Signal Display (3-section w/ bimodal bottom lens)           | EA   | 1   | \$ 1,250.00  | \$ 1,250.00      |
| Pedestrian Signal Display (Countdown)  | EA   | 8   | \$ 600.00    | \$ 4,800.00      |
| APS Push Button Assembly (Polera)  | EA   | 8   | \$ 1,000.00  | \$ 8,000.00      |
| Aluminum Regulatory Sign   | EA   | 1   | \$ 500.00    | \$ 500.00        |
| Aluminum Street Name Sign  | EA   | 3   | \$ 750.00    | \$ 2,250.00      |
| Conduit Push/Jack Under Road + Conduit + Wiring                              | LF   | 250                                       | \$ 40.00     | \$ 10,000.00     |
| Conduit Trench + Conduit + Wiring  | LF   | 75  | \$ 20.00     | \$ 1,500.00      |
| Type 2 Junction Box  | EA   | 4   | \$ 350.00    | \$ 1,400.00      |
| Type 3 Junction Box  | EA   | 2   | \$ 450.00    | \$ 900.00        |
| Wavetronix Matrix Stop Bar Detection Assembly (4 units/approaches)           | INT  | 1   | \$ 32,000.00 | \$ 32,000.00     |
| Wavetronix Smart Sensor Advance Detection Assembly (two units/approaches)    | INT  | 1   | \$ 13,000.00 | \$ 13,000.00     |
| RuggedCom RSG 2200 Ethernet Switch   | EA   | 1   | \$ 10,000.00 | \$ 10,000.00     |
| VDSL Modem   | EA   | 1   | \$ 1,500.00  | \$ 1,500.00      |
| GTT Model 711/721 Opticom Detector (One Channel, 1 or 2 directions)          | EA   | 3   | \$ 750.00    | \$ 2,250.00      |
| LED Luminaire + Lamp + Ballast   | EA   | 3   | \$ 600.00    | \$ 1,800.00      |
| Anticipated Items  | EA   | 1   | \$ 7,500.00  | \$ 7,500.00      |
| <b>TOTAL CONSTRUCTION COST \$</b>  |      |   |              | <b>234,665</b>   |
| <b>ENGINEERING SUPPORT</b>   |      |   |              |                  |
| Engineering & Construction Management  | LS   | ALL                                       | \$59,000.00  | \$59,000.00      |
| <b>ENGINEERING SUPPORT SUBTOTAL</b>  |      |   |              | <b>\$ 59,000</b> |
| <b>ADDITIONAL COSTS</b>  |      |   |              |                  |
| Right-Of-Way   | LS   | ALL                                       | \$0.00       | \$0.00           |
| Utility Relocation   | LS   | ALL                                       | \$0.00       | \$0.00           |
| <b>ADDITIONAL COST SUBTOTAL</b>  |      |   |              | <b>\$ -</b>      |
| <b>TOTAL PROJECT SUBTOTAL \$</b>   |      |   |              | <b>293,665</b>   |
| <b>30% Contingency \$</b>  |      |   |              | <b>88,100</b>    |
| <b>TOTAL ESTIMATED PROJECT COST \$</b>                                       |      |   |              | <b>381,765</b>   |

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the

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**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

**Madras Planning On-Call**  
**US97 and J Street Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

|                                   |                               |
|-----------------------------------|-------------------------------|
| <i>Prepared By: Ryan McFadden</i> | <i>Date: December 2, 2021</i> |
|-----------------------------------|-------------------------------|

|  |  |
|--|--|
| <i>Reviewed By: Darren Hippenstiel</i> |  |
|--|--|

|                                       |  |
|---------------------------------------|--|
| <i>This Estimate has a Rating of:</i> | <b>3C</b> <i>(See rating scale guide below.)</i> |
|---------------------------------------|--|

| ITEM | UNIT | TOTAL QUANTITY | UNIT PRICE | TOTAL COST |
|------|------|----------------|------------|------------|
|------|------|----------------|------------|------------|

**Madras Planning On-Call**  
**Hal Road Extension Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

| Prepared By: Jacki Gulczynski                          |      |                | Date: November 29, 2021                   |                   |
|--|------|----------------|---|-------------------|
| Reviewed By: Darren Hippenstiel                        |      |                |   |                   |
| This Estimate has a Rating of:                         |      |                | <b>3C</b> (See rating scale guide below.) |                   |
| ITEM   | UNIT | TOTAL QUANTITY | UNIT PRICE                                | TOTAL COST        |
| Mobilization   | LS   | ALL            | \$13,000.00                               | \$13,000.00       |
| Traffic Control  | LS   | ALL            | \$7,000.00                                | \$7,000.00        |
| Erosion Control  | LS   | ALL            | \$2,000.00                                | \$2,000.00        |
| Removal of Structures and Obstructions                 | LS   | ALL            | \$3,000.00                                | \$3,000.00        |
| Clearing and Grubbing                                  | LS   | ALL            | \$3,000.00                                | \$3,000.00        |
| General Earthworks                                     | CY   | 400            | \$25.00                                   | \$10,000.00       |
| Asphalt Roadway - Full Depth                           | SF   | 9,340          | \$4.00                                    | \$37,360.00       |
| Subgrade Geotextile                                    | SY   | 1,038          | \$1.00                                    | \$1,038.00        |
| Concrete Curbs - Standard Curb & Gutter                | LF   | 625            | \$22.50                                   | \$14,062.50       |
| Concrete Walks   | SF   | 1,820          | \$7.90                                    | \$14,378.00       |
| Detectable Warnings                                    | EA   | 3              | \$500.00                                  | \$1,500.00        |
| Extra for Pedestrian Ramps                             | EA   | 3              | \$1,000.00                                | \$3,000.00        |
| Storm Water System & Water Quality Treatment, Complete | LS   | ALL            | \$29,000.00                               | \$29,000.00       |
| Pavement Markings, Complete                            | LS   | ALL            | \$2,000.00                                | \$2,000.00        |
| Signage, Complete                                      | LS   | ALL            | \$2,000.00                                | \$2,000.00        |
| <b>TOTAL CONSTRUCTION COST</b>                         |      |                |   | <b>\$ 142,339</b> |
| <b>ENGINEERING SUPPORT</b>                             |      |                |   |                   |
| Engineering & Construction Management                  | LS   | ALL            | \$36,000.00                               | \$36,000.00       |
| <b>ENGINEERING SUPPORT SUBTOTAL</b>                    |      |                |   | <b>\$ 36,000</b>  |
| <b>ADDITIONAL COSTS</b>                                |      |                |   |                   |
| Right-Of-Way   | LS   | ALL            | \$93,000.00                               | \$93,000.00       |
| Utility Relocation                                     | LS   | ALL            | \$50,000.00                               | \$50,000.00       |
| <b>ADDITIONAL COST SUBTOTAL</b>                        |      |                |   | <b>\$ 143,000</b> |
| <b>TOTAL PROJECT SUBTOTAL</b>                          |      |                |   | <b>\$ 321,339</b> |
| <b>30% Contingency</b>                                 |      |                |   | <b>\$ 96,410</b>  |
| <b>TOTAL ESTIMATED PROJECT COST</b>                    |      |                |   | <b>\$ 417,749</b> |

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

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**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.



**Madras Planning On-Call**  
**Culver Hwy & H Street Crossing Cost Estimates**  
 City of Madras



**Engineer's Conceptual Estimate**

| Prepared By: Ryan McFadden                      |      | Date: January 10, 2022                    |             |              |
|---|------|---|-------------|--------------|
| Reviewed By: Jacki Gulczynski                   |      |   |             |              |
| This Estimate has a Rating of:                  |      | <b>3C</b> (See rating scale guide below.) |             |              |
| ITEM  | UNIT | TOTAL QUANTITY                            | UNIT PRICE  | TOTAL COST   |
| Vehicle Pedestal + Foundation                   | EA   | 4   | \$ 2,509.00 | \$ 10,036.00 |
| Push Button Post + Foundation                   | EA   | 1   | \$ 950.00   | \$ 950.00    |
| Service + Cabinet + Foundation (BMCL)           | EA   | 1   | \$ 5,000.00 | \$ 5,000.00  |
| APS Push Button Assembly (Polera)               | EA   | 2   | \$ 1,000.00 | \$ 2,000.00  |
| Aluminum Regulatory Sign                        | EA   | 12  | \$ 500.00   | \$ 6,000.00  |
| Conduit Push/Jack Under Road + Conduit + Wiring | LF   | 40  | \$ 200.00   | \$ 8,000.00  |
| Conduit Trench + Conduit + Wiring               | LF   | 1100                                      | \$ 20.00    | \$ 22,000.00 |
| Type 1 Junction Box                             | EA   | 6   | \$ 250.00   | \$ 1,500.00  |
| Type 2 Junction Box                             | EA   | 1   | \$ 350.00   | \$ 350.00    |
| Utility connections/coordinations               | EA   | 1   | \$ 5,000.00 | \$ 5,000.00  |
| Luminaire Pole + Luminaire Arm                  | LF   | 2   | \$ 5,000.00 | \$ 10,000.00 |
| Conduit + Wiring Only (No Trenching)            | LF   | 15  | \$ 200.00   | \$ 3,000.00  |
| LED Luminaire + Lamp + Ballast                  | EA   | 2   | \$ 600.00   | \$ 1,200.00  |
| TOTAL CONSTRUCTION COST                         |      |   |             | \$ 75,036    |
| TOTAL PROJECT SUBTOTAL                          |      |   |             | \$ 75,036    |
| 30% Contingency                                 |      |   |             | \$ 22,520    |
| TOTAL ESTIMATED PROJECT COST                    |      |   |             | \$ 97,556    |

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

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