1.0 | Project Summary Information

1.1 Project Name (35 letters max) Bulldog Boulevard Safety Improvements

1.2 Project Type Road - Reconstruction

1.3 Limits (descriptions should be identifiable. i.e: intersections, place names, landmarks, 35 characters max) Bulldog Blvd (1230 North) - Provo River to Canyon Road

1.4 Project Description (summary of project) The project would reconstruct Bulldog Blvd with a raised landscaped center median as well as a raised landscaped buffer for a dedicated bicycle lane to minimize turning movement conflicts and to increase bicycle safety.

1.5 Sponsor (jurisdiction, agency name) Provo City/UDOT

1.6 Project Manager Brian Torgersen
   Office Phone 801-852-6745   Cell Phone 801-376-2293
   Fax 801-852-6730              Email btorgersen@provo.org

1.7 Total Project Cost (includes local match and additional funds) $4,500,000
   PE Cost $212,239
   ROW Cost $0
   Construction Cost $3,609,000
   Funds already available to project (less local match) $1,500,000
   MPO Federal Funds Request (includes 6.77% local match) $3,000,000

1.8 Local/Regional Significance
   Is project in local general plan? Yes
   Is project in MPO transportation plan? Yes
   Is project on a corridor on the Utah State Functional Class Map? Yes

1.9 Air Quality Benefit (summarize CM/AQ Report, NA for non-CM/AQ eligible projects)
   Air quality analysis indicates a reduction in vehicle miles traveled of 75 miles per day with a reduction in NOX of 90 kg per day.

1.10 Leadership Approval (local=mayor, manager, commissioner; state=dept. head)
Acknowledges knowledge, support and approval to submit project to Mountainland.

Signature  Mayor  3/24/16

Position  Date
2.0 | Project Scope
Enter NA for answers to questions not applicable to your project.

2.1 Describe purpose and need of project.
The purpose of the project is to construct a raised center median to eliminate left turn movements along the Bulldog Blvd corridor which has a crash rate that is 3 times higher than the state average for roadways of similar functional class and traffic volumes. The corridor has a severe crash rate that is 7.5 times higher than the statewide average for roadways of similar functional class and traffic volume. The project will also eliminate one travel lane in each direction in favor of a protected bicycle lane. There is a significant number of bicycle crashes on the corridor given the lack of adequate bicycle facilities on this important gateway into the BYU campus. The project will provide an important bicycle/pedestrian connection from the Provo River Parkway Trail to the BYU campus.

2.2 Describe existing service/conditions
The existing corridor is a 7 lane facility with and AADT as high as 28,000 vehicles per day. The corridor has a large number of driveway accesses to the many businesses and other facilities along the corridor.

2.3 Highway Project Information

SR# or FA#
N/A

Beginning Mile Post
Provo River (625 West)

End Mile Post
Canyon Road (150 East)

Length of project
0.75 miles

Existing number of Travel Lanes
7

Width of facility.
80'

Facility surface type.
Asphalt Concrete with PCCP at intersections of State Street and University Avenue

2.4 Transit / Pedestrian Facility Project Information

Route#
The project will be designed to accommodate transit to assist with increased pedestrian access.

**Length of project**
0.75 miles

**What is the expected use of the facility or program?**
Protected bike lanes, sidewalk, safer general purpose lanes and transit stops along the corridor.

**What services are provided in the operating of this project?**
Buffered bike lanes and transit stops.

2.5 **Describe any equipment to be purchased** (buses, ITS, etc.).
Traffic cameras, upgraded vehicle detection and emergency vehicle preemption.

2.6 **Describe how project is consistent with local plans.**
The project is a significant element of the Provo City Bicycle Master Plan as well and the MAG Core Bicycle Network for Utah County.

2.7 **Describe how project is consistent with Utah County ITS plan.**
This corridor helps provide emergency access to the Utah Valley Regional Medical Center and provides redundancy in our fiberoptic network.

2.8 **If phased or segmented, describe how the phase has logical termini and what will future phases consist of.**
The project is not proposed to be phased at this point in time.

2.9 **Is project being coordinated with or constructed with a larger project?**
Yes. It is an element of Provo City's City-wide Bicycle/Pedestrian Plan.

2.10 **Describe how project will alleviate congestion on this or other facilities.**
By minimizing the number of driveway accesses, traffic flow along the corridor will improve.

2.11 **Describe any traffic improvements**. (i.e. lanes, signal coordination, ITS, turn lanes, bus pullouts, etc.)
Improvements include: Raised median, raised bicycle buffer, signal modifications and optimization, an additional left turn lane will be added at 500 West.

2.12 **Describe any safety improvements for vehicular and pedestrian traffic**. (i.e. raised median, channelization of turn movements, barriers, parkway strips, etc.)
The project will add a raised center median to control left turn movements. Additionally, a raised bike lane buffer will be added to minimize conflicts between bikes and vehicles.

2.13 **How are complete streets addressed with this project?** (plan for pedestrians, bikes, transit, trails,
The project is adding a buffered bike lanes in each direction which will provide for a dedicated space for bicycles and will allow for sidewalks to be used for pedestrians only.

2.14 Describe traffic control changes at intersections. (Include info to warrant changes)
An additional left turn lane will be added at the intersection of Bulldog and 500 West. Minor improvement to other signalized intersections will be made to accommodate turn lanes as well as the protected bike lanes.

2.15 What right-of-way is already secured?
The additional right-of-way needed for the project has been dedicated by adjacent property owners as part of redevelopment projects along the corridor (UVRMC, Provo High School).

2.16 What additional right-of-way is needed?
No additional right-of-way is needed.

2.17 Describe utility work to be performed and indicate who will do the work.
The overhead power line that runs along the north side of Bulldog Blvd will be buried underground. The installation of conduit will be performed by the contractor on the project and the conductor work will be provided by Provo City Power. Other utility work should be only incidental and can likely be avoided through the design process.

2.18 What type of environmental work will most likely be needed?
Categorical Exclusion

2.19 Facility Design

<table>
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<th>Design Year w/o Improvements</th>
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MPO Concept Report 6
3.0 | Project Ranking

The following categories will be used by MPO staff to score each project. The points associated with each category show what total points MPO staff can give. MPO staff’s recommendations will be made available to the MPO TAC Committee for their use in making final project selection recommendations. MPO staff ranking is a tool to aid the MPO TAC Committee in their final selection. The committee is not required to pick projects solely on MPO staff ranks. Please note, if questions pertinent to the project are not answered, zero points will be given.

3.1 Congestion Relief (25 Points)

Explain if the project...

a) Provides an alternate transportation facility that corrects an identified congested problem?

The project minimizes the number of driveway accesses and eliminates left turn access, thereby improving capacity and traffic flow along the corridor. Additionally, a second left turn lane will be added at 500 West which will minimize delay and allow the for more efficient operation of the intersection.

b) Reduces congestion by reducing the number of vehicles.

The project will provide for a safe environment for bikes and pedestrians, which will entice increased active transportation along the corridor. The demand for personal vehicles will be reduced as bikers and recreational users are accomodated with a protected bike facility. In addition, accommodations from transit stops along the corridor will be constructed with the project.

c) Reduces the need for additional highway lanes for peak hour capacity.

Bikes help reduce vehicle trips and help reduce peak hour traffic; therefore, reducing the need for additional highway capacity. Additionally, the capacity on Bulldog Blvd is facilitated by improved signal timing along the corridor. Intersection improvements will increase intersection efficiency and reduce peak hour congestion.

d) Increases the efficiency of transportation system through traffic management measures.

The project eliminates left turn movements except at intersections where these movements are signalized. The project also provides a well-delineated space for bicycles which minimizes conflicts and driver confusion, thereby increasing efficiency.

e) Adds turning movements to relieve a congested intersection.

The project will add an additional left turn lane at 500 West, which will improve efficiency at this congested intersection.

f) Design year number of users. Users include the average AADT for highways and users per day for transit, trails, and other projects.

The AADT for Bulldog is expected to range from 20,000 to 32,900 by the year 2040 along the corridor. The segment between 500 West and 300 West carries the most vehicles while the section between Freedom Blvd and University Avenue carries fewer vehicles. The bicycle use is expected to continue to rise given that the corridor is the
gateway to the BYU Campus.

g) 2020 V/C data (computed by MPO staff)
2024 V/C range of 0.57 to 0.90 and AWDT range of 14,000 to 23,500 (5 lane road)

3.2 Mode Choice (25 points)
Explain if the project...

a) Benefits multiple transportation systems (transit and highway, pedestrian and transit). The benefits of the project reach across all modes of transportation. Providing a protected space for bicycles will increase bike ridership significantly. The project also has transit areas planned all along the corridor. These improvements will significantly increase the number of pedestrians, bicycles and transit users on the corridor.

b) Promotes alternative transportation solution to SOV use.

The project will be designed in a manner to encourage a reduction in the operation of SOV. Current SOV use will be reduced given the bicycle and pedestrian improvements proposed with the project that will provide a safer environment for bikes and peds and promote more active transportation and less SOV use.

c) Creates or improves linkages between transportation modes.

The corridor provides an important active transportation link from the west side of Provo and the Provo River Parkway Trail to BYU and and other locations and destinations along the corridor.

d) Reduces physical, psychological, or economic barriers to carpool, bike, walk, or transit use.

The project will provide the complete streets elements which are currently missing. The protected bike facilities along with the additional landscaping, plants, grass, and trees will promote a more pedestrian and bike friendly atmosphere.

e) Provides incentives to carpool, bike, walk, or transit use.

The project provides great active transportation options and will create a much safer atmosphere for these activities.

3.3 Environmental Quality (15 points)
Explain if the project...

a) Provides cost effective emission reductions (amount of reduction justifies cost).
This project will not only provide significant emission reductions due to the addition of protected bike lanes but will serve as a model for future "complete streets" projects in Provo and Utah County.

b) Helps efforts to attain and maintain national air quality standards.
In addition to the protected bike lane facilities being added with the project, the installation of the raised median will eliminate left turn movements at unsignalized locations
along the corridor. This will significantly reduce the number of vehicles that are left idling as they wait for adequate gaps in traffic. The turn lane improvements at signalized intersections will improve signal efficiency and consequently help to reduce air quality concerns.

c) Minimizes environmental impacts or reduces existing impacts (e.g. air/water/noise pollution).
   The project will minimize noise impacts along the corridor adding landscaping features to soften the noise. The project also provides opportunities for landscaping and other treatments that can be incorporated into the drainage system that will improve water quality of storm runoff.

d) Enhances the natural, cultural, or historic environment.
   The landscaped median and bike lane buffers will restore some of the natural beauty which was lost when the corridor was first constructed and provide an inviting atmosphere for active transportation.

e) Mitigates invasive impacts to existing neighborhoods/commercial areas (minimal relocations).
   The landscaped medians and bike lane buffers provide an important buffer between businesses and high volumes of vehicular traffic. The ROW impacts along the project corridor are very minimal and have been incorporated into the redevelopment plans of projects along the corridors.

3.4 Safety (20 points)
Explain if the project...

a) Corrects/improves a verified or potential safety or accident problem.
   The crash rates on Bulldog Blvd are 7-10 times higher than the statewide average for roadways of similar classification and traffic volumes. The majority of these crashes are angle crashes which will be mitigated with the installation of the raised median. The installation of raised medians will significantly improve safety along the corridor.

b) Improves information/communications for traffic operations and emergency responders.
   The project will include signal modifications, traffic cameras and emergency vehicle preemption which will provide maximum benefit to emergency vehicles and traffic operations along the corridor.

c) Reduces severity of crashes.
   This project will reduce accident severity by eliminating high occurrence left turn angle crashes and by separating bikes and peds from vehicle traffic. UDOT Traffic and Safety has evaluated the project and has determined that the project improvements have a total cost/benefit of $4.4 million dollars based on the crash reduction potential of the proposed improvements.

d) Enhances safe movement of pedestrian, bicycle traffic.
   This project will provide for a separated and protected bicycle lane in each direction as well as increased separation of pedestrians from the bicycle and vehicular traffic. The bike lane
buffer will be a raised landscaped area that will provide a safe environment and positive separation from vehicles.

e) Provides an intermodal safety improvement (e.g. separation of vehicles-trains, vehicles-pedestrian).

This project will provide for a separated and protected bicycle lane in each direction as well as increased separation of pedestrians from the vehicular traffic. Transit stops along the corridor will be constructed and designed in a manner which will provide a well-defined space separated from other mode uses.

3.5 Other Considerations (15 points)
Explain if the project...

a) Effectively distributes funding throughout the MPO area.

This project constructs an important link to BYU and surrounding areas to the entire county through a connection to the Provo River Trail which connects to many other important trails throughout the county which will benefit users from many communities, not just Provo. Provo City is a hub for education, government and medical services within Utah County.

b) Phases project in a manner that the MPO can use limited funds efficiently.

The project could be phased by installing the center medians in one phase and the bike lane buffers in another phase, however this creates duplication of paving work that would make phasing the project undesirable. Phasing this project does not make sense, as it would not provide important elements necessary for a successful project.

c) Cost effectiveness is appropriate for the amount of improvement made.

UDOT Traffic and Safety has evaluated the proposed improvements, as outlined in the attached Memorandum, and found that the cost/benefit of the project, as calculated from the UDOT CMF worksheet and the CMF Clearinghouse website, is $4.4 million dollars with 0.07 severe crashes reduced annually.

d) Benefits transportation users from adjacent municipalities.

The corridor improvements will provide for a fantastic connection between the Provo River Trail which connects to the Murdock Canal Trail and through this connection would connect nearly every city in Utah County with BYU, UVRMC and other key locations within Provo City.

e) Is supported by elected officials.

Provo Mayor John Curtis and the Provo Municipal Council are supportive of the project and are anxious to see construction begin.
4.0 | Air Quality Report

All projects that are eligible for CM/AQ and CM/AQ-PM2.5 funds must complete this report (see CM/AQ Eligibility list at www.mountainland.org/tipselection). These funds are eligible for projects and programs countywide.

4.1 Eligibility

CM/AQ funds can only be used for projects and programs that a direct benefit to air quality can be demonstrated. Highway expansion, such as new single occupancy vehicle lanes, is not eligible. Turn lanes at congested intersections, transit programs, pedestrian and trail projects, signal modernization, ITS, and IM programs are typical eligible CM/AQ projects.

4.2 CM/AQ Program

The purpose of the CM/AQ program is to fund transportation projects or programs that will contribute to attainment or maintenance of the National Ambient Air Quality Standards (NAAQS) in Ozone (O₃), Carbon monoxide (CO), Particulate Matter – 10 microns (PM₁₀), and PM₂.₅ non-attainment and maintenance areas. The city of Provo is a maintenance area for CO and Utah County is a non-attainment area for PM₁₀ and PM₂.₅.

4.3 Completing this Report

All projects eligible for CM/AQ funds must complete this report. Completing this report can be quite technical, Susan Hardy, Air Quality Coordinator at Mountainland, can help with filling out this report. Contact her at 801/229-3842 or shardy@mountainland.org.

4.4 Quantitative Analyses

A quantitative assessment of how a proposed project or program is expected to reduce emissions is important to assist in selecting the most effective use of this fund. List below all travel benefits directly related to this project. Air quality benefit calculations must utilize Mobile 6. The air quality analysis should include assessing emission reductions of transit, traffic flow improvements, ITS projects and programs, ridesharing, bicycle and pedestrian improvements. Complete at least one of the sections below. If quantitative analyses cannot be done, do a qualitative assessment in 4.3.

a) Vehicle Miles Traveled

Number of Vehicle Miles Traveled reduced (VMT): 100 trips x 0.75 miles/trip = 75 miles
Average distance of trips reduced: 0.75 Miles
Emission reduction per average weekday: NOX = 75 miles x 1.2 kg/mile = 90 kg NOX/day; VOC = 75 miles x 0.63 kg/mile = 47.25 kg VOC/day

b) Idling Time

Average idling time per vehicle reduced: N/A
Number of vehicles with reduced idling time: N/A
Emission reduction per average weekday: N/A

C) Vehicle Speed

Average change in vehicle speed (speed before and after): Unknown
Number of vehicles affected: 32,900
4.5 Qualitative Assessment

Although a quantitative analyses of air quality impacts is required whenever possible, some improvements may not lend themselves to rigorous quantitative analysis, because of the projects characteristics or because practical experience is lacking to adequately analyze the project. In these cases, a qualitative assessment based on a reason and logical examination of how the project or program will decrease emissions and contribute to attainment or maintenance of a NAAQS is appropriate.

As has been discussed, the Bulldog Blvd Improvement Project will undoubtedly improve air quality by attracting multi-modal and active transportation users to this important commercial corridor in Provo. The addition of an additional left turn lane at the congested 500 West intersection will optimize signal operations and minimize vehicle idling. Additionally, the elimination of left turn access on this 7 lane facility is sure to improve air quality by eliminating queing of vehicles waiting for the few adequate gaps to enter/exit traffic as they make left turns into, and out of, the many businesses along the corridor.
5.0 | Project Cost Estimate
To develop a project cost estimate, please supply a detailed cost breakdown of your unit costs, inflation, equipment, right-of-way, contingency, etc. To do so, use the Concept Costs Estimate Excel form provided by UDOT (available at www.mountainland.org/tipselection). Non-construction projects such as equipment purchases, operations, administration programs, studies, etc. can use other methods to show their estimated costs. All sheets or methods used should be submitted as part of the Supplemental Information accompanying the Concept Report.

5.1 Cost Summary
Summarize the information from the Costs Estimate Excel form or other method. Enter NA for items that do not apply to the project.

- a) Preliminary Engineering $232,000
- b) Environmental Work $416,700
- c) Construction $3,086,000
- d) UDOT Review (project cost <$500k = $5k, >500K = $10k) $10,000
- e) Construction Engineering $290,000
- f) Subtotal $4,034,700
- g) Inflated Cost Factor (inflate to year of construction) 1.16
- h) Total Project Cost (enter total cost, not funding request)) $4,434,000
- i) Additional Funds (less local match) Available to Project $1,500,000
- j) MPO Federal Funds Request (includes 6.77% local match) $3,000,000

6.0 | Supplemental Information
Please submit any supporting documentation including maps, diagrams, charts, cost estimates, etc. that will allow MPO and UDOT staff and any Technical Advisory Committee to make an informed decision regarding the proposed project. Keep Supplemental Information submittals to 8 pages total.

6.1 Concept Report Submittal
In order to facilitate the distribution of the Concept Reports and any supplemental information, all Concept Reports with leadership signature, shall be combined with any supplemental information and saved in PDF format as one document. Please note that this might create a large data file that might be too large to emailed. Plan accordingly to submit your report in electronic format (CD, DVD, Flash Drive) by the required due date. Concept Reports are due by Thursday 03/24/2016 at 6pm.

6.2 Contacts, Questions
For help with the Concept Report or questions, please contact:

Bob Allen, AICP
586 East 800 North, Orem UT 84651
p.801/229-3813  f.801/229-3801
email ballen@mountainland.org

Shawn Eliot, AICP
586 East 800 North, Orem, UT 84097
p.801/229-3841  f.801/229-3801
email seliot@mountainland.org
# Bulldog Blvd Safety Improvements
## Cost Estimate - Concept Level

**Prepared By:** Brian Torgersen  
**Date:** 3/23/2016

### Proposed Project Scope:
Install raised landscaped median and bike lane buffers.

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<th>PROJECT NAME:</th>
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### Construction Items

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| Roadway and Drainage | $1,516,922 |
|                      | Raised Medians, etc. |

| Traffic and Safety | $270,703 |
|                    | Signal System Mod, striping, etc. |

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| Environmental Mitigation | $416,700 |
|                          | Landscaping, etc. |

| ITS | $0 |

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| Utilities | $450,000 |

| Incentives | $0 |

| Miscellaneous | $0 |

### Cost Estimate (ePM screen 508)

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### Proposed Commission Request
| TOTAL | $3,841,000 | TOTAL | $4,434,000 |

## Project Assumptions/Risks

1.  
2.  
3.  
4.  
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11.  
12.  
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3/23/2016  
Page 1 of 1  
Concept Level Est Form  
Rev. 7/31/2013