Executive Summary for:

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

Prepared for and in coordination with

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1. Project Purpose

The purpose of this study is to evaluate existing and future traffic operations and safety for the Converse and Dell Range intersection and the Converse Avenue corridor between Dell Range and Ogden Road. The following are the project goals for this study:

Develop alternatives and a 35% design plan for a preferred alternative for the reconstruction of the Converse and Dell Range intersection that will improve safety and operations for motorists, pedestrians and bicyclists.

Develop a 35% design plan for the completion of reconstruction of Converse Avenue between Dell Range and Ogden for all transportation modes; and also including new storm sewer design.

2. Public Outreach and Meetings

A major component to this study was informing the public and obtaining public input for the evaluation of intersection alternatives and preliminary design. HDR worked with the Cheyenne MPO to conduct a comprehensive public outreach program that included public open houses, online surveys, social media Q&A, media blasts, comment forms and one-on-one meetings to inform the public and gather input. A project steering committee, formed of various area stakeholders, was also established to assist and guide the project. A total of four formal steering committee meetings and two public open houses were conducted during the course of the project.

3. Intersection Alternatives Development and Analysis

The development of alternatives was based on the steering committee's and public's understanding of the intersection's deficiencies and the project's needs. Below is a description of this process.

3.1. Identification of Deficiencies

In order to establish the current conditions of the Dell Range – Converse intersection, a model of the existing geometry was developed. The results concluded that the existing intersection with current traffic volumes functions at a LOS E in the AM, which is considered poor and a LOS C during the mid-day and PM peaks.

3.2. Alternatives Development

With input from the Steering Committee, a list of potential alternatives was developed for analysis. The list of alternatives is as follows:

1. Short Term Improvements
2. Dual Left-Turn Lanes
3. Modern Roundabout
4. Continuous Flow Intersection – Full
5. Continuous Flow Intersection – Modified
6. ThruTurn Intersection – Signals
7. ThruTurn Intersection – Roundabouts

3.3. Decision Matrix Development

An initial meeting was conducted with the steering committee to present a list of possible intersection alternatives and identify key issues and concerns to be used in the evaluations of these alternatives. A list of possible concerns were generated and presented to the committee to determine the most critical concerns of the committee that should be considered in comparing and evaluating alternatives. A ranking of the top issues were developed.

Data gathered from the first Public Open House, stakeholder meetings, one-on-one meetings and social media tools were also used to develop a list of issues in regards to the intersection and corridor. A compilation of the steering committee meeting and public input were used to develop criteria for a decision matrix to aid in the comparison of alternatives.

3.4. Alternatives Analysis

The seven alternatives were evaluated against the evaluation criteria. The criteria were established based on the values that the steering committee expressed to the design team and what the public shared at the first public open house. These criteria included:

1. Safety
2. Ease of Use
3. Congestion/Queuing
4. Business Access
5. Drainage
6. Land Acquisition

Initially, the alternatives were analyzed using the criteria of improved safety, ease of use, and reduction of congestion and queuing. The results of this analysis were presented to the steering committee to refine the alternatives down to three final alternatives. The congestion/queuing criterion was analyzed quantitatively using operations analysis software, as described below. The safety criterion was based on how effectively each alternative would reduce the overall number of conflict points. As such, this criterion was evaluated initially quantitatively, although some results were tweaked qualitatively. The ease of use criterion was evaluated qualitatively based on the complexity of the intersection, with consideration given to out-of-direction travel and how well pedestrians and bicyclists could maneuver through the intersection. These criteria were used to develop a matrix (see Figure 3-1 - Decision Matrix) to compare all of the alternatives and presented in a meeting with the MPO and the Steering Committee. The purpose of this meeting was to present the traffic analyses for all alternatives, present the preliminary decision matrix and determine the preferred alternatives. A concise decision for a preferred alternative was not able to be made. It was decided that three alternatives and the no-build alternative would be presented at the second open house, and further evaluation of the three alternatives to determine land and property impacts were needed. The top three alternatives were the dual left turns, modern roundabout, and the modified continuous flow. Conceptual designs were developed for the three alternatives. These concepts were discussed by the group again and a ranking by the Steering Committee members ranked the Modified Continuous Flow Intersection the highest, followed by the Dual Left Turn and lastly the Modern Roundabout Current intersection with Short Term Improvements alternative was not included in this ranking.

Figure 3-1 - Decision Matrix

Option	Description	Safety			Ease of Use			Congestion/ Queuing		Cost	ROW
		Vehicle	Pedestrian	Bike	Intersection Complexity	Multi-Modal	Emergency Vehicle/Large Truck Maneaurvability	Traffic Operations: LOS	Traffic Operations: Length of Queue	Total Cost	Dev.& Undev. Land Acquistion
1	No-Change	●	●	●	◓	◒	◒	●	●	◓	◓
2	Dual Left Turn Lanes	◒	◒	◒	◓	○	○	◒	◒	○	○
3	Modern Roundabout	◉	◓	◓	○	○	○	◉	◉	●	◒
4	Continuous Flow Intersection (Full)	○	◒	○	◒	◒	○	◒	◒	●	●
5	Continuous Flow Intersection (Modified)	◒	○	○	○	○	◓	○	○	○	○
6	Thru-Turn Intersection (with signals)	○	◓	○	●	◉	◒	◓	◓	◒	◓
7	Thru-Turn Intersection (with roundabouts)	◓	◓	◓	●	◓	◒	◓	◓	●	○

LEGEND:

● Poor ◒ Fair ○ Good ◓ Better ◉ Best

Figure 3-2 - Dual Left Concept

Figure 3-3 - Modern Roundabout Concept

Figure 3-4 - CFI Modified Concept

A comparison of the pros and cons of each of these alternatives is presented in the table below;

Table 3-1 - Alternative Pros and Cons Comparison

	Dual Left Turns	Modern Roundabout	CFI - Modified
Pros	• Most conventional alternative • Lowest Cost of Remaining Alternatives • Anticipated to be least impactful to existing right-of-way	• Mitigates crash potential • Provides highest capacity	• Mitigates most noted safety concerns • Provides needed capacity enhancements • Meets project goals with relatively conventional geometry • Signalization at Mountain Road
Cons	• Doesn't mitigate noted safety concerns • Doesn't provide needed capacity enhancements	• Highest cost alternative • Most right-of-way & directly impacts private business • Extensive retaining walls • Impacts Ped. Bridge • Perceived most difficult for Pedestrians & Bicycles	• Doesn't mitigate all noted safety concerns • Impacts to Pedestrian Bridge Abutment

4. 35% Design

Converse Avenue 35% design between Ogden Road and Dell Range Boulevard has been performed in accordance with guidelines from the City of Cheyenne Unified Development Code, AASHTO Policy on Geometric Design of Highways and Streets (2011), and guidance from local governing agencies in the area.

5. Drainage

A drainage study was conducted for the Converse Avenue corridor between Ogden Road and the Dry Creek Bridge north of Dell Range Boulevard. The scope of the analysis focused on converting the existing drainage channel that parallels Converse Avenue to a subsurface system with reconstruction and expansion of the roadway. Because the current intersection with Short Term Improvements alternative emerged as the preferred option for the near term, drainage features at the Converse/Dell Range intersection were not modified or changed. The original storm sewer through this area was installed in 1992 (based on City GIS data). Converse Avenue was reconstructed more recently from Ogden Road to the north. The design flows for the study were provided by the City and recommendations are based on the 100-year peak discharges at specific concentration points along the existing drainage ditch.

6. Environmental Considerations

An environmental screening process was developed to identify any major obstacles that would need to be addressed in environmental documentation required for the project. This process also provided a

place of initiation for the National Environmental Policy Act (NEPA) process and documentation. The purpose of this environmental screening was to provide a review of existing databases, a synthesis of input from regulatory agencies, desktop evaluations, recommendations for detailed studies, and potential mitigation needs. During implementation of a project, additional work would need to be completed to further assess impacts of the projects on environmental resources.

7. Conclusion

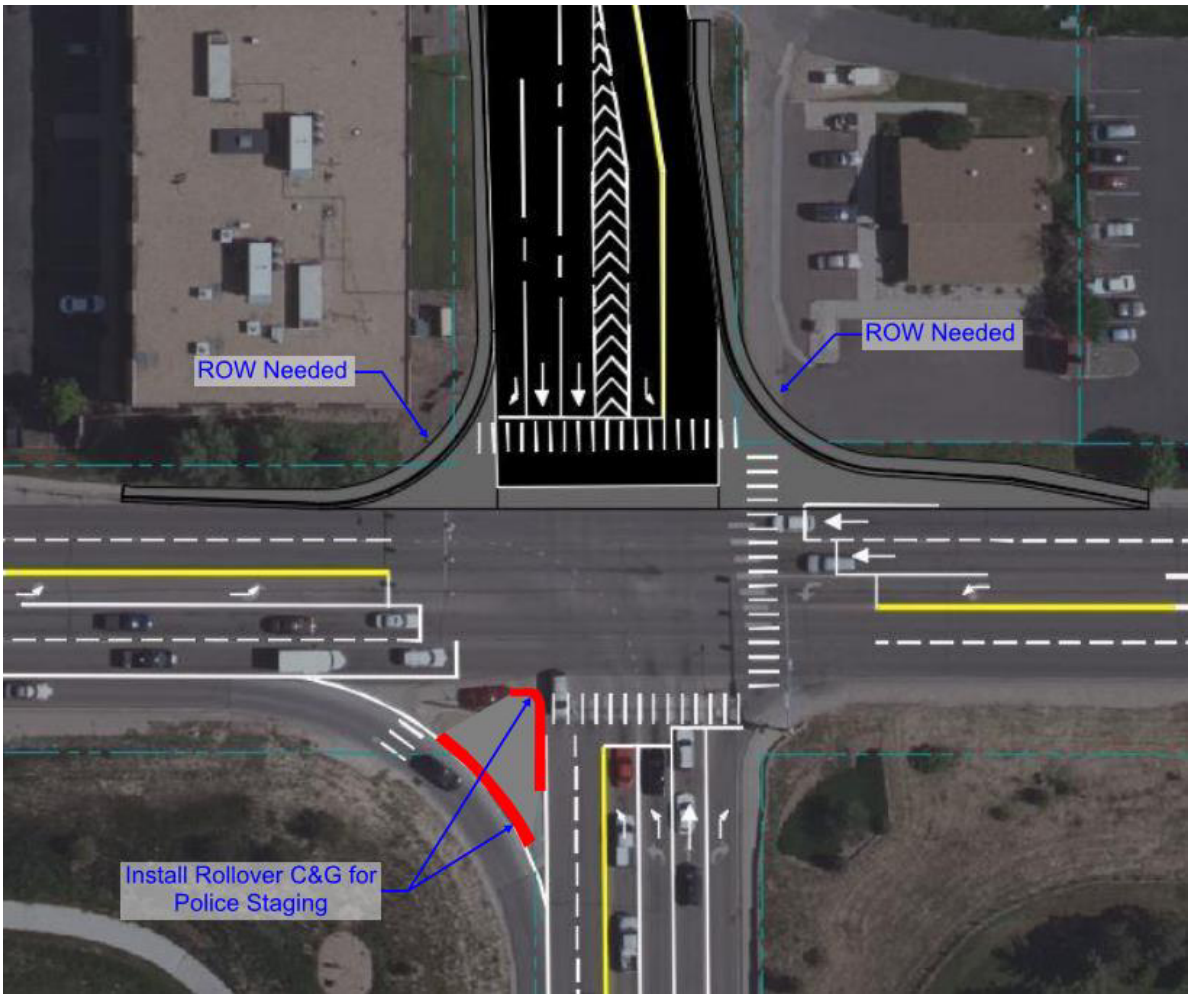
The analysis methodology, the resulting output, the public input and recommendations from the design team were presented to the Steering Committee and the MPO Technical Committee. The preferred intersection alternative from this entire process was the Modified Continuous Flow Intersection. Given that funding for this project did not make the sixth-penny ballot initiative in May, 2017, and that the funding source for this project is uncertain in the foreseeable future, the short term improvements to the existing intersection should be incorporated until the preferred alternative can be funded.

At this time, it is recommended that the improvements derived for the Short Term Improvements alternative be constructed to improve safety and functionality until a funding source for the preferred alternative become available. The recommended improvements were incorporated into the 35% design and the Engineer's Opinion of Probable Costs and include;

- Restriping the north leg to shift the southbound left-turn lane to the east
- Eliminate the split phasing for the north-south approaches
- Optimize the signal timing, including adding right-turn overlaps for the northbound right turn, the southbound right turn, and the westbound right turn
- Add supplemental left-turn heads for the eastbound and the westbound approaches
- Increase the curb-and-gutter radius in the northwest and northeast corner to better accommodate truck traffic
- Providing a staging location for law enforcement to monitor the intersection
- Provide 10 feet wide pedestrian crossings on the north, east and south legs of the intersection with stop bars. Pedestrian crossing times should be evaluated to ensure that it satisfies the current MUTCD standard for a 3.5 feet per second pedestrian speed.
- Stagger stop bars to move waiting vehicles out of the south bound left turn, west bound left turn, and north bound left turn movements as illustrated in Figure 7-1- Short Term Improvements.

Safety improvements will be realized inherently when the overall corridor improvements identified in this study and previous studies are completed. Improved connectivity and dedicated pedestrian and bicycle facilities will provide improved safety conditions when compared to existing conditions such as the creation of a grade separated Greenway crossing of Dell Range Boulevard at Dry Creek, near Grandview Avenue. Additionally, future analysis of a grade separated crossing along Converse Avenue between Dell Range and Point Bluff is recommended based on comments received during the public meeting process. Additionally, some improvement to traffic operations and a general increase in intersection safety will be realized by completing the Short Term Improvements alternative.

Figure 7-1- Short Term Improvements



Another recommendation is for the City to consider the purchase of a portion of, or the entire parcel of land on the northeast corner of the intersection. This would provide the needed land for the recommended improvements of the Short Term Improvements alternative and the preferred Modified Continuous Flow Intersection. This land could also be used to assist with traffic and law enforcement efforts at this intersection. A safe and visible staging area for law enforcement vehicle parking and observations could be incorporated on this land.

8. Engineer's Opinion of Probable Cost

The costs for the project were developed using average bid prices from projects previously bid in the City of Cheyenne, the City of Gillette, and WYDOT in Laramie County and historical HDR project experience using present 2017 dollars. The Engineer's Opinion of Probable Cost is $4,895,303.50 for the costs associated with 35% designs for the Converse Avenue corridor and the Short Term Improvements alternative. These costs do not include ROW acquisition, additions to the Dry Creek Bridge or grade separated pedestrian crossings.