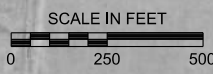


- LEGEND**
- EXISTING ROW
  - PROPERTY LINE
  - PROPOSED ROW
  - RETAINING WALL
  - PROPOSED SURFACING
  - REMOVE ROADWAY
  - RAISED MEDIAN
  - BRIDGE STRUCTURE
  - SIGNAL CONTROLLED INTERSECTION



**Alternative 2 - Single Point Urban Interchange**

US16 / US16B / Catron Blvd Study    Rapid City, SD

Figure  
**12**

### 4.3.2 Alternative 2: Single Point Urban Interchange (SPUI)

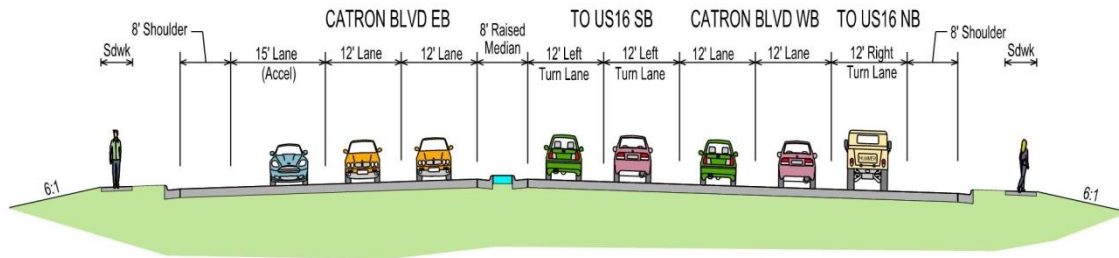
As shown in Figure 12, the SPUI is composed of an elevated US16 bridge overpass and a single at-grade intersection below the bridge structures. The single intersection is characterized by the opposing left movements through the intersection. There are numerous SPUIs currently located in Rapid City. Alternative 2 will provide a future LOS C.

The SPUI will require a longer bridge length and includes more retaining wall than other alternatives. The twin bridges that cross over US16B / Catron Boulevard are anticipated to have a roadway width of 36 feet and an overall out-out length of 375 feet. It is anticipated these structures would be 3-span girder bridges with concrete decks. The bridges in this option would be similar to the I-90 bridges that cross over Haines Avenue.

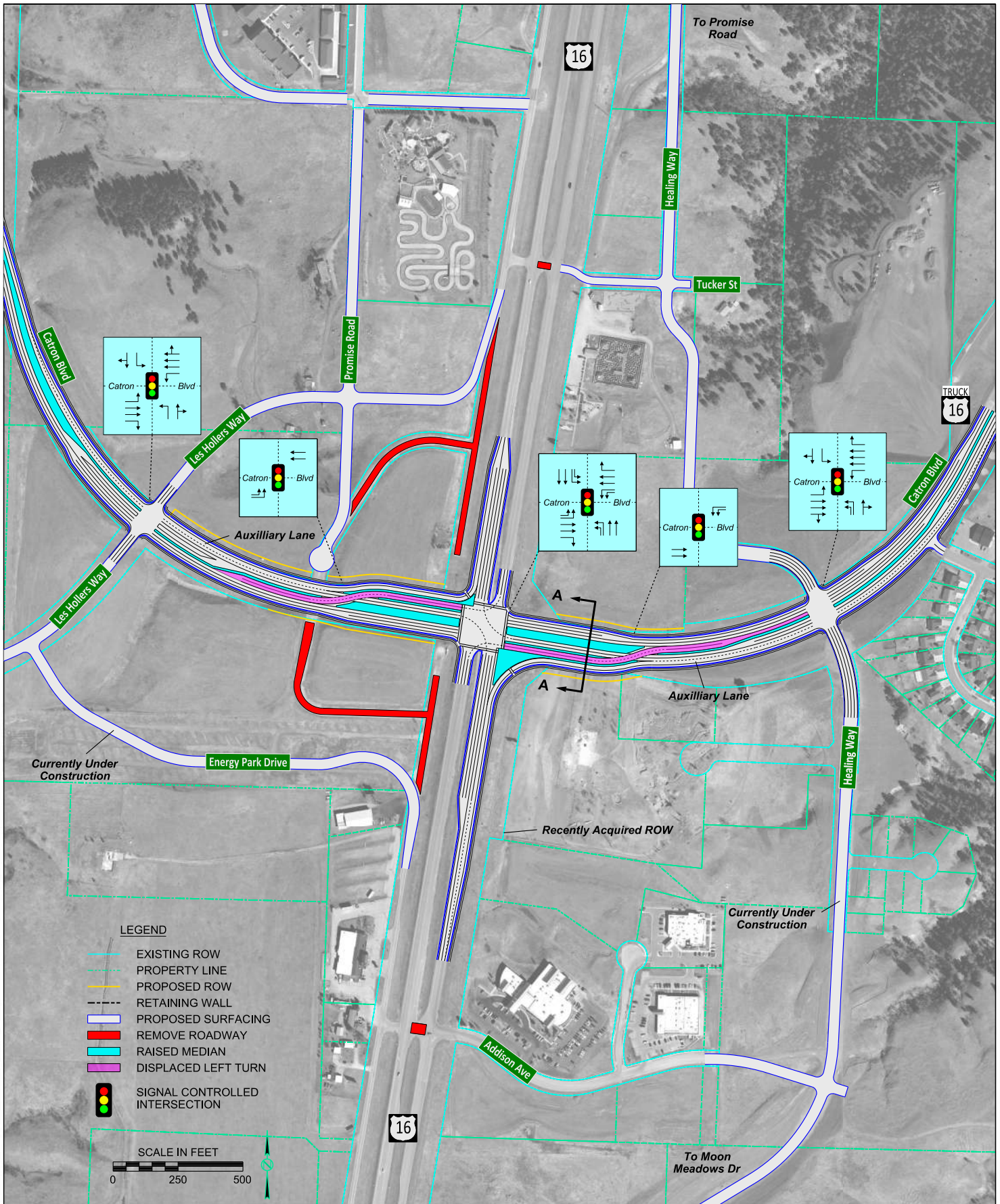
The SPUI will meet the demands of future traffic with the three phase signal system. The main drawback of the SPUI is the overall cost. The SPUI is also less friendly than other options for pedestrian crossings, in that pedestrians cannot cross US16B / Catron Boulevard at the interchange.

As shown in the layout and typical section, the SPUI consists of two through lanes, two left turn lanes, and a right turn lane on all legs of the intersection. The typical section for the bridge is the same as that proposed for Alternative 1.

As the alternatives were refined and evaluated, the Single Point Urban Interchange and Continuous Flow Intersection emerged as the highest ranked options. The SPUI alternative was further modified, providing three additional options to address the potential weaving conflict on US16B / Catron Boulevard between the eastbound acceleration lane and right turn lane at Healing Way as described in Section 4. Layouts of the additional options were developed as Alternatives 2.1, 2.2, and 2.3 and are included as Figures 13, 14, and 15. Of all four SPUI options (2, 2.1, 2.2 and 2.3), Alternative 2 is the recommended approach for addressing the merging conflict on eastbound US16B / Catron Boulevard between US16 and Healing Way. See Section 4 for additional discussion.



Typical Section – US16B / Catron Boulevard (Figure 12, Section A-A)



**Alternative 5 - Continuous Flow Intersection**  
 US16 / US16B / Catron Blvd Study    Rapid City, SD

Figure  
**18**

#### 4.3.5 Alternative 5: Continuous Flow Intersection (CFI)

Alternative 5 includes a CFI as shown in Figure 18. The CFI improves traffic operations by crossing over the left turning vehicles to the other side of oncoming traffic before the main intersection. For Alternative 5, the crossover or left turn displacement is incorporated for only two legs of the intersection on US16B / Catron Boulevard. The CFI consists of two, two phase signalized intersections at the crossover locations and a three phase traffic signal at the main intersection. Alternative 5 will provide a future LOS C.

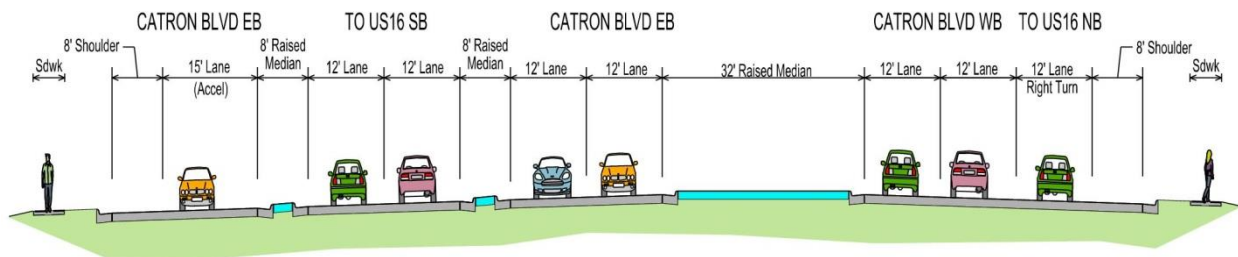
The CFI provides the necessary capacity for efficient future operations. It also has the lowest construction cost. In addition to these benefits, there are no structures required and it is pedestrian friendly.

The CFI had low overall ROW impacts since they are limited to the US16B / Catron Boulevard corridor. However, the ROW impacts extend deeper into private property along the US16B / Catron Boulevard corridor than other alternatives. Another drawback of this option is user familiarity since there are no existing CFIs in South Dakota.

It is also noteworthy that a third westbound lane had to be added on US16B / Catron Boulevard, east of the Healing Way intersection in order to develop the necessary left turn lanes and queue lengths at the CFI. The projected queue for the westbound to southbound left turn lane was evaluated to ensure it would not interfere with the Healing Way intersection.

The CFI layout includes an eastbound auxiliary lane between US16 and Healing Way to address the potential weaving conflict between the eastbound acceleration lane and right turn lane at Healing Way as described in Section 4. The auxiliary lane continues east of Healing Way, similar to SPUI Alternative 2, providing room for acceleration prior to merging into the eastbound lanes.

The three intersections that compose the CFI will require traffic signal coordination. There may be benefit in coordinating all five of the closely spaced signalized intersections on US16B / Catron Boulevard in the future (includes Healing Way and Les Hollers Way intersections). Variations in daily and seasonal traffic demand will likely create the need for regular maintenance of the traffic signal timing patterns. An adaptive traffic signal system would mitigate the need for ongoing maintenance by automating the signal timing adjustments based on live traffic conditions.



Typical Section – US16B / Catron Boulevard (Figure 18, Section A-A)