



Concept Report

Pony Express Road Connection to
Porter Rockwell Boulevard

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1 Introduction

This concept report examines the engineering feasibility and associated costs of a roadway connection between Pony Express Road (on the west side of the Interstate 15 [I-15] frontage road) and Porter Rockwell Boulevard south of the 14600 South interchange in Bluffdale, Utah. Figure 1 shows the study area that HDR investigated in relation to 14600 South and its interchange with I-15.

Figure 1. Project Location



In addition to providing a critical link in the Bluffdale and regional transportation network, the connection is intended to address several other objectives including encouraging truck traffic to use Porter Rockwell Boulevard instead of Pony Express Road north of the Mt. Jordan pit and eliminating the Y intersection at Pony Express Road and the Mt. Jordan pit access road.

The connection is identified in the 2017 Bluffdale City Transportation Plan as a long-term project (10 to 20 years). It's classified as a future major collector, while Pony Express Road is currently classified as a minor collector. The plan shows the connection as a signalized intersection with Porter Rockwell Boulevard aligned with Freedom Point Way.

Porter Rockwell Boulevard and 14600 South (at the Pony Express Road intersection) are classified as arterials in the 2017 plan.

Bluffdale City and the Utah Department of Transportation (UDOT) entered into a jurisdictional transfer agreement to transfer a significant portion of 14600 South (State Route 140) to Bluffdale City in exchange for UDOT taking ownership of Porter Rockwell Boulevard (State Route 131). UDOT will retain ownership of 14600 South from Porter Rockwell Boulevard through the I-15 interchange.

In addition to other defined terms and conditions, the agreement also identifies access locations onto Porter Rockwell Boulevard. Significant to this concept report, accesses are identified at Freedom Point Way and Regent Garden Lane. As is typical with most frontage roads, UDOT retains ownership of Pony Express Road, but Bluffdale City is responsible for its maintenance.

The current full-service intersection of Pony Express Road with 14600 South permits all traffic movements (Figure 2). However, its close proximity to the I-15/14600 South interchange directly affects the level of service of the interchange. As traffic congestion increases with future development, it is likely Pony Express Road will be restricted to only right-in and right-out movements with 14600 South to keep the I-15/14600 South interchange operating at an acceptable level.

This configuration is consistent with other highly congested I-15 interchanges along the Wasatch Front. It would require westbound traffic on 14600 South needing to go southbound on Pony Express Road do so by way of Porter Rockwell Boulevard. Also, as it becomes more difficult for drivers to weave across 14600 South to access northbound I-15 from Pony Express Road, accessing northbound I-15 from Porter Rockwell Boulevard will become more attractive.

Figure 2. 14600 South/I-15 Interchange



2 Alternatives Development

HDR developed roadway alignments and profiles using maps provided by Bluffdale City and with a goal of minimizing cuts, fills, and retaining walls. HDR also tried to preserve developable property as much as possible. Alternatives were also evaluated for their conformance with the access locations in the Porter Rockwell Boulevard transfer agreement and how well they accommodate a future right-in, right-out intersection of Pony Express Road with 14600 South. HDR investigated several iterations of three alternatives (A, B, and C) and discussed them with the City before further evaluating Alternative C. All three alternatives eliminate the Y intersection at Pony Express Road with the Mt. Jordan pit access road.

2.1 Alternative A

HDR investigated a northern connection referred to as Alternative A (Figure 3) that keeps Pony Express Road on its existing alignment and provides access to Porter Rockwell Boulevard just south of the milk farm. This alternative requires a new T intersection with a stop sign at Porter Rockwell Boulevard; this intersection wasn't identified in the Porter

Rockwell Boulevard transfer agreement with UDOT. Switching the Regent Garden Lane access for the new connection could be investigated in the future if this alternative is pursued further.

This alternative eliminates a small park that provides stormwater detention storage, and severs the adjacent neighborhood. The maximum grade of the connection is 10%, and the alternative includes a stop sign at Pony Express Road. The alternative doesn't accommodate a future right-in, right-out intersection of Pony Express Road with 14600 South very well. Alternative A requires steep extensions of both Royal Mile Drive (10%) and the Mt. Jordan pit access road (8%) with a stop sign at Pony Express Road.

2.2 Alternative B

Alternative B (Figure 4) includes a connecting road with a T intersection at Pony Express Road and a signalized intersection with Porter Rockwell Boulevard at Freedom Point Way. Similar to Alternative A, Pony Express Road would remain on its present alignment. The connection requires steep grades of 13%, which exceed design standards. The alternative also doesn't match the recently platted storage unit development in the northwest quadrant of the T intersection. Because traffic will tend to remain on Pony Express Road, this alternative doesn't encourage truck traffic to use Porter Rockwell Boulevard, nor does it accommodate a future right-in, right-out intersection at 14600 South very well. This connection also requires steep extensions of both Royal Mile Drive (10%) and the Mt. Jordan pit access road (11.5%) with a stop sign at Pony Express Road.

2.3 Alternative C

HDR evaluated several variations of a curved connection between Pony Express Road intersecting with Porter Rockwell Boulevard at Freedom Point Way and discussed them with the City before settling on Alternative C (Figure 5). This alternative best meets the goals and objectives of the connection. It preserves as much developable property as possible, and the roadway profile closely matches the existing topography. The grade of the Mt. Jordan pit access road would remain as it is currently, and the access road's intersection with the connector can be refined during final design to further reduce the amount of right-of-way required and eliminate impacts to the adjacent billboard.

The 35-miles-per-hour curve closely matches the recently approved development in the northwest quadrant of the intersection. This connection has maximum grades of 10% with a 6% grade at the access road intersection, which meets design criteria. A portion of the existing Pony Express Road would be abandoned. Alternative C best accommodates a future right-in, right-out intersection at 14600 South and encourages truck traffic onto Porter Rockwell Boulevard.

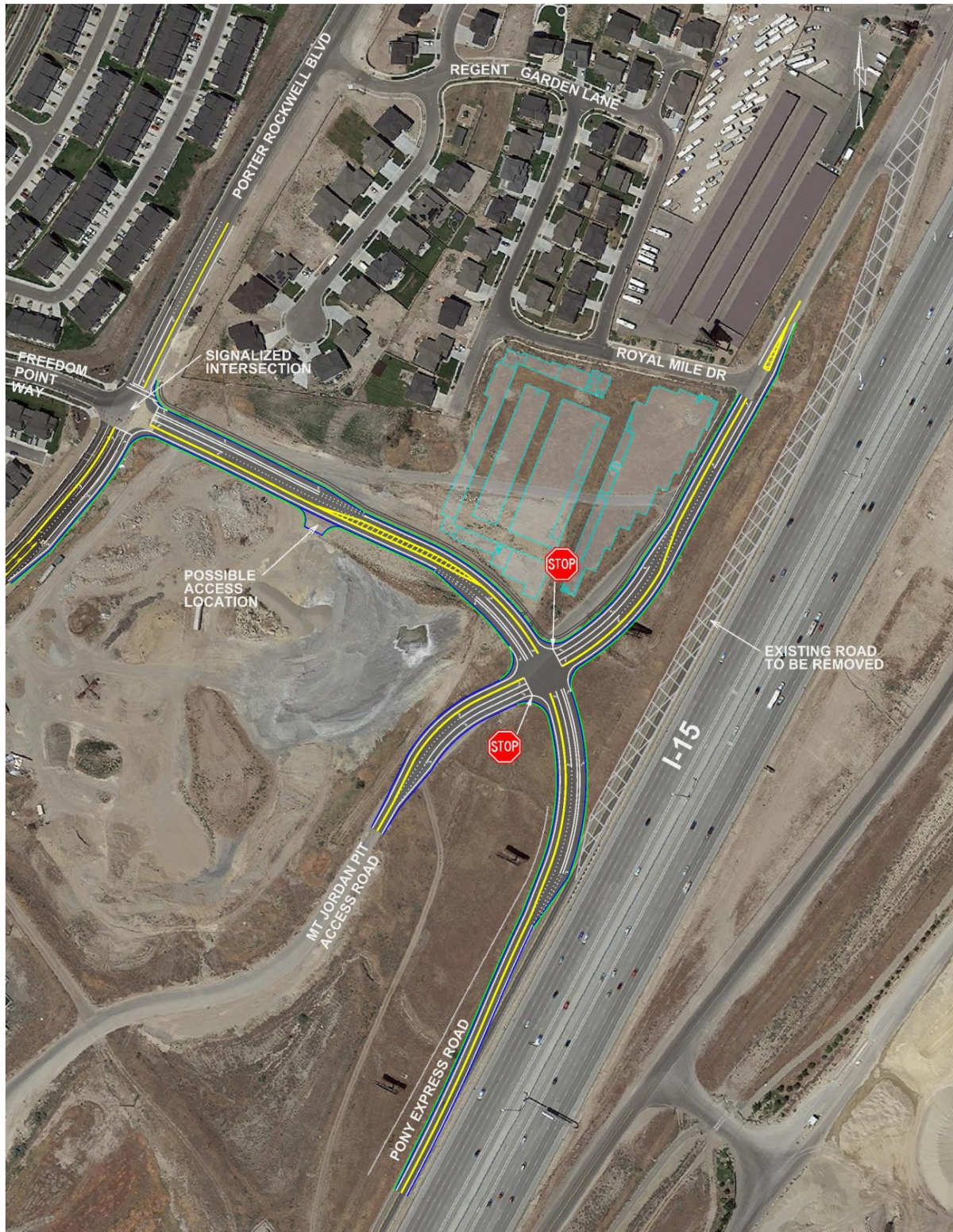
Figure 3. Alternative A



Figure 4. Alternative B



Figure 5. Alternative C



3 Roadway Considerations

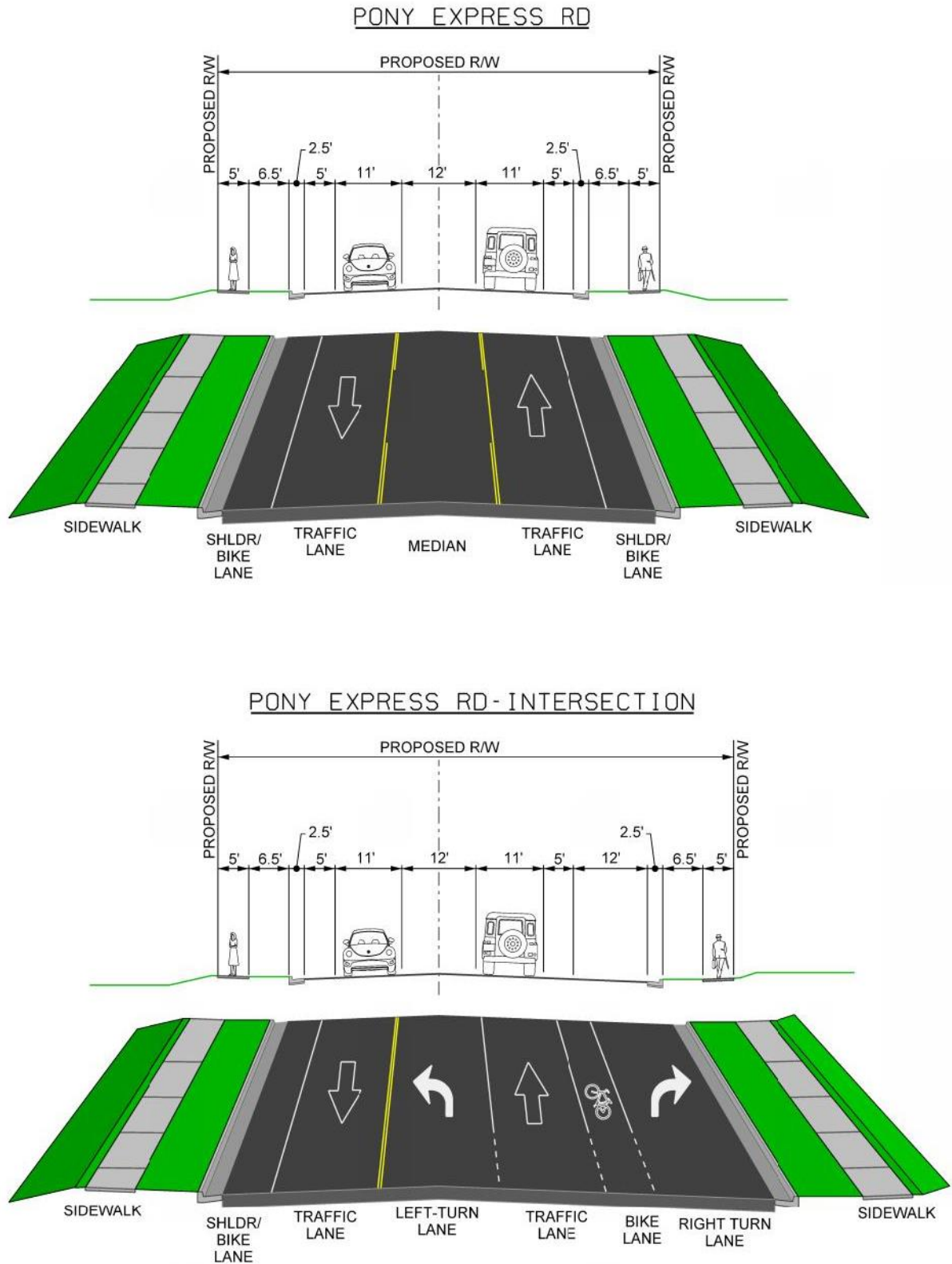
Alternative C meets the American Association of State Highway and Transportation Officials (AASHTO) roadway design requirements for a collector in mountainous terrain. The design speed was set at 35 miles per hour, and the maximum grades are 10%. In addition to 11-foot-wide traffic lanes, the typical section for the Pony Express Road connector includes shoulder/bicycle lanes, curb and gutter, park strips, and sidewalks. HDR used this typical section (Figure 6) to determine the required roadway footprint and right-of-way and to develop concept-level costs. Because of the close proximity of the Mt. Jordan pit access road to Porter Rockwell Boulevard and anticipated accesses to adjacent properties, HDR designed a median turn lane for the entire connection.

HDR assumes that the intersection with Porter Rockwell Boulevard will be signalized, but it can initially be constructed as a two-way stop and the signal constructed during a later phase when warranted. The intersection with the Mt. Jordan pit access road is designed as a two-way stop for the access road. A requirement of the connection is to permit access south into the Mt. Jordan pit property bounded by Porter Rockwell Boulevard to the west and the pit access road to the east. The area is zoned as Commercial and Regional Commercial in the City of Bluffdale General Land Use Map. The distance between the controlled intersections of the connector is 1,000 feet, which would allow an additional street access in accordance with the UDOT Highway Access Management Spacing Standards. A possible access location is shown in Figure 5. A traffic study should be used to determine the exact location and if other design features of the connector road are required.

About 3,500 square feet of retaining wall are required to accommodate Alternative C. A storm drain system was laid out to capture drainage from the curb and gutter and discharge it into an existing Bluffdale City drainage facility at Porter Rockwell Boulevard. HDR assumed that a detention basin isn't required. HDR didn't perform subsurface utility investigation for this concept report, but one should be performed during final design. The concept estimate assumes relocation of power, fiber optic, and phone lines that are visible through field inspection.

HDR didn't investigate the potential environmental impacts of Alternative C. The study area has been developed extensively with gravel mining, existing roads, and a network of social roads. The study area is composed of upland vegetation on steep gravelly terrain with no evidence of wetlands. No structures would be affected. A study of potential environment impacts should be undertaken during the design phase.

Figure 6. Typical Sections



4 Concept-Level Estimate

HDR used UDOT's concept cost estimate template to develop rough order-of-magnitude (ROM) costs for Alternative C (Table 1). Quantities for the different items were developed from the preliminary design, and unit costs were obtained from the recently constructed Redwood Road widening project. The estimate assumes 2017 unit costs that were inflated 3% annually to 2024. Construction costs include a 20% contingency for items not identified and a 9% contingency for change orders. Design engineering and construction management were set at 8% plus design includes cost for the environmental document.

Table 1. Estimated Costs for Alternative C

Item	2017	2024
Right-of-way	\$798,200	\$981,700
Design engineering	\$207,300	\$250,400
Construction management	\$187,300	\$230,400
Construction	\$2,861,400	\$3,893,400
Total	\$4,054,200	\$5,355,900

5 Next Steps

The Pony Express Road connection to Porter Rockwell Boulevard is planned for 1 to 6 years in the 2015 Bluffdale City Capital Facilities Plan. In January 2018, Bluffdale applied to the Wasatch Front Regional Council for federal 2024 Surface Transportation Program funds based on the estimate in Table 1 above.

Although the estimate was developed for the total project costs, there are opportunities to phase the project as it moves into the design phase, depending on the available funding. For example, a sidewalk could be constructed on one side of the connector, a four-way stop at Porter Rockwell Boulevard could be initially constructed until a signalized intersection is warranted, and so on.

The spreadsheet used to develop the Alternative C costs is provided with this concept report and can be modified to evaluate different funding scenarios and combinations. The design files for all three alternatives were also provided and can be used to develop final design for project advertising.