

8 CONCLUSIONS AND RECOMMENDATIONS

The independent design team recommends Alternative RGM6 as the best option to connect US 550 to US 160. The discussions and summary tables presented in Chapters 6 and 7 provide the data that support this conclusion. The following sections summarize some of the important issues that led to the recommendation of RGM6.

8.1 CONCLUSIONS

8.1.1 Purpose and Need

All three alternatives studied in detail (R5, RGM, and RGM6) meet the three elements of Purpose and Need listed in the *US 550 South Connection to US 160 Supplemental Final Environmental Impact Statement/Section 4(f) Evaluation to the US Highway 160 from Durango to Bayfield EIS*: capacity, safety, and access control. A preliminary design was developed for each alternative (see **Chapter 6 Exhibits and Appendices A, B, and C**) and detailed cost estimates were prepared (see **Appendix D**). All three alternatives will accommodate the 2035 traffic volumes and include a grade-separated interchange at US 550 and US 160. Likewise, all three alternatives could be designed and constructed to meet all code provisions and all are feasible. Alternative R5, however, has some safety issues that do not exist with Alternatives RGM or RGM6. These are explained in Section 8.1.4 below.

8.1.2 Existing US 550 Corridor versus New Corridor

Both the RGM and RGM6 alignments diverge from the existing US 550 alignment just south of CR 220, then cross the Webb Ranch property before connecting to the existing Grandview interchange. The R5 alignment generally follows the existing US 550 corridor and connects with a new interchange at the existing US 550/US 160 intersection.

The R5 alignment, although feasible, has significant drawbacks that potentially render it not reasonable or prudent. The alignment requires the acquisition of residences and a business, is expensive and difficult to construct, has more impacts to wetlands and threatened and endangered habitat, and results in a roadway alignment that is inferior to either RGM or RGM6. The existing US 550/US 160 intersection location, in Wilson Gulch, does not easily accommodate a modern interchange, and the resulting R5 interchange is complex, environmentally impactful, and expensive.

Building a new R5 interchange would result in two closely spaced interchanges (R5 and Grandview), which is less desirable than one interchange accommodating the same connections. The R5 alternative does not take full advantage of the partially completed Grandview interchange.

8.1.3 Construction Cost

The estimated project costs—preliminary engineering, construction, construction engineering, and right-of-way (ROW)—for RGM6 and RGM are approximately the same: \$91 million and \$90 million, respectively. The cost for R5 is more than twice as much, at \$184 million (see preliminary designs in **Appendices A, B, and C**, and cost estimates in **Appendix D**).

8.1.4 Operations and Safety

As stated in Section 8.1.1 above, all three alternatives will meet the future traffic demands of the project corridor and can be constructed to meet all code provisions. However, after construction, R5 would still have tighter curves and steeper, longer grades than RGM6 (smallest radius = 325 feet for R5 versus 1,060 feet for RGM6; steepest grade = 5 percent for 2,270 feet for R5 versus 3 percent for 670 feet for RGM6).

Ultimately, US 550 will be a four-lane divided highway from New Mexico north to US 160, encouraging higher speeds than the current roadway handles. Approaching US 160, the R5 alignment would include a long 5-percent grade down Farmington Hill approaching the new interchange. The roadway's north-facing exposure near the bottom of the hill could lead to icy conditions in winter. At the bottom of the hill, drivers would navigate a 325-foot-radius left turn and cross over US 160 on a new bridge (which will likely ice more quickly than the roadway) before coming to a stop at Ramps J and M (see **Appendix A**). Thus, although this alignment meets all design codes, it is not desirable. Both the RGM and RGM6 alignments have more favorable approaches to the interchange with US 160.

8.1.5 Disruptions and Safety during Construction

Both RGM and RGM6 could be built almost entirely off-line, without impacting existing US 550 traffic. The construction requires no special phasing to keep existing traffic flowing and presents no special challenges. R5, on the other hand, requires a complex multi-stage plan to build the alignment while keeping traffic flowing on existing US 550 (see **Exhibits 6-13 through 6-16**). This would result in more disruption, cost, and risk, as there are inherent safety concerns when the public is traveling through complex construction zones. R5 would require at least two seasons (and likely more) to build, resulting in long-term construction delays.

8.1.6 Residential or Business Relocations

Neither RGM6 nor RGM will require residential or business relocations. R5 requires the total acquisition of three residences and one business, Eagle Block, which has been operating in Durango since 1951. Eagle Block is owned by the Piccoli family, who have always lived in the adjacent residences. The Piccolis support the RGM6 alternative.

8.1.7 Bridgework at Grandview Interchange

The RGM alternative requires that the existing bridge over US 160 at the Grandview interchange be widened to accommodate four lanes of traffic and a left-turn lane. Due to the incorporation of a roundabout south of US 160, RGM6 allows the ultimate four lanes of traffic over US 160 to be accommodated using the existing bridge. No left-turn lane is needed (see **Exhibit 6-20**).

8.1.8 Maintenance Costs

The R5 alternative requires five bridges and extensive tall retaining walls along US 550 and the ramps. R5 requires almost 400,000 square feet of retaining walls compared to less than 60,000 for either RGM or RGM6. All of these structures will require ongoing maintenance. The RGM and RGM6 alternatives have fewer structures and less retaining wall, resulting in lower maintenance costs.

8.1.9 Visual Impacts

RGM6 has fewer adverse visual impacts than either RGM or R5. Because it is built into a cut on the edge of Florida Mesa, it is obscured from view from the top of the mesa (from the Webb Ranch or CR 220) and mostly obscured from below (US 160). The bridge over Gulch A will be visible from US 160 when looking up the gulch (see **Exhibits 5-2, 6-31, 6-33 to 6-35, 6-37, and 6-38** and cross-sections in **Appendix C**). R5 would require numerous tall walls along Farmington Hill that are highly visible from US 160 (see **Exhibit 6-29** and cross-sections in **Appendix A**).

8.1.10 Large-Animal Crossings and Connectivity

For all alternatives, a large-animal crossing is provided with the new US 160 bridge over Wilson Gulch. For both RGM and RGM6, the existing US 550 highway down Farmington Hill will be obliterated and potentially reclaimed, thus removing a barrier at the present highway location. The RGM6 alignment would provide two large-animal crossings in the natural draws (Gulch A and Gulch B) plus a proposed cattle crossing on the Webb Ranch. The RGM alignment would provide a crossing at Gulch A plus the Webb Ranch cattle crossing. The R5 alignment would provide a bridge over the steep gulch on the Piccoli property but it is uncertain if this location is suitable for an animal crossing.

8.1.11 Impacts to Webb Ranch Operations

RGM6 does not bisect any of the Webb Ranch pastures and leaves the ranch virtually intact. Stock ponds could be replaced and an underpass would provide access for cattle and equipment to get to the small piece of fenced Webb property west of the new RGM6 alignment (see **Exhibit 6-26**).

8.1.12 Wetland Impacts

RGM6 and RGM have fewer wetland impacts than R5. The R5 alignment impacts the high quality wetlands in Wilson Gulch. The wetlands impacted by RGM6 are mainly stock ponds that could be replaced in kind.

8.1.13 Threatened and Endangered Species Habitat

R5 has greater impacts to the threatened and endangered species habitat (southwestern willow flycatcher and New Mexico meadow jumping mouse) in and around Wilson Gulch (see **Exhibit 7-1** and **Appendix P**).

8.1.14 Stakeholder Support

RGM6 was universally supported by major stakeholders including the county, the city, the Piccolis, Christopher Webb (representing the Webb Ranch), and the Growth Fund Real Estate Group (the development subsidiary of the Southern Ute Indian Tribe that is developing the Three Springs section of Durango). All stakeholders interviewed by the design team supported connecting at Grandview, which both RGM and RGM6 do.

8.1.15 Section 4(f) Property Impacts

R5, RGM, and RGM6 will all result in direct impacts to Section 4(f) properties, affecting 12.2, 53.6, and 44.4 acres respectively (see **Exhibits 7-8, 7-9, and 7-10**). Complete avoidance of Section 4(f) properties is not possible with any alternative. All three alternatives have been shown to be feasible, but R5 may not

be prudent. A separate Section 4(f) evaluation will be required, which is beyond the scope of this alternatives analysis. However, the information in this section can be compared to the criteria for “prudent” contained in FHWA’s Section 4(f) Policy Paper dated July 20, 2012. An alternative is not prudent if:

1. *The alternative doesn’t address the purpose and need of the project.*

All three alternatives address the purpose and need of the project, however Alternatives RGM and RGM6 are more responsive to the safety elements of purpose and need, since Alternative R5 has safety issues as described below and in Section 8.1.4.

2. *It results in unacceptable safety or operational problems.*

All alternatives will operate satisfactorily. R5 has steeper grades and sharper curves, which could compromise safety, as described above. In addition, R5 would result in a long, complex, staged construction process, which also could compromise safety during construction.

3. *After reasonable mitigation, it still causes severe social, economic, or environmental impacts; severe disruption to established communities; severe or disproportionate impacts to minority or low-income populations; or severe impacts to environmental resources protected under other federal statutes.*

R5 would result in the loss of three residences and the Eagle Block business, as described above. R5 also has greater impacts to high quality wetlands, fish habitat, riparian habitat and threatened and endangered species habitat in Wilson Gulch.

4. *It results in additional construction, maintenance, or operational costs of extraordinary magnitude.*

R5 will cost more than twice as much as the other two alternatives—at least \$90 million more. Ongoing maintenance costs will also be greater for R5, due to the quantity of structures and walls.

5. *It causes other unique problems or unusual factors.*

R5 does not connect to the Grandview interchange and the planned growth north of the interchange. Its location along the existing US 550 alignment makes building the roadway while maintaining traffic on existing US 550 very difficult, expensive and risky, requiring a complex and risky construction phasing plan. Constructing the roadway on a steep slope with erodible soils and drainage and slope stability problems, while maintaining traffic on the very narrow existing road, is technically difficult.

8.2 RECOMMENDATIONS

Because of the many factors discussed above, the design team recommends the RGM6 Alternative. This determination was based on extensive data evaluation, field investigation, and preliminary design. The design team investigated multiple alignments between R5 and RGM, and multiple interchange types. The preliminary designs were well advanced to provide reasonable certainty that critical issues have been indentified and cost estimates are reasonable. It is the opinion of the design team that CDOT has a solid foundation to move ahead with Section 4(f) evaluation, NEPA documentation, permitting, final design, and construction.