

# LEGACY

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## PARKWAY & PRESERVE

### MEMORANDUM

**TO** UDOT, FHWA, USACE

**FROM** Terry Warner

**DATE** July 25, 2005

**SUBJECT** Addendum to the Legacy Parkway Technical Memorandum Denver & Rio Grande Corridor Evaluation

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This memorandum is an addendum to the Legacy Parkway Technical Memorandum, Denver & Rio Grande Corridor Evaluation (D&RG Tech Memo), dated December 2004. The project team has collected new information since the publication of the technical memorandum. The resulting changes are described below.

**1. Section 3.1.2, Relocations.**

The methodology for evaluating relocation impacts for the D&RG conceptual alignments consisted of identifying existing residential or commercial structures within the right-of-way (ROW) of the conceptual alignments. As described in Section 3.0 of the technical memorandum, a narrower (80-m) footprint was used for the D&RG conceptual alignments to minimize impacts in areas with existing development.

Several new residential developments have been platted in the D&RG study area since publication of the D&RG Tech Memo. These new residential developments include Valentine Estates and Mountain View in Woods Cross and Birnam Woods in West Bountiful. See revised Figure 2-2 (attached). The Foxboro development in North Salt Lake was addressed qualitatively in the D&RG Tech Memo. The impacts of the D&RG conceptual alignments on the new developments (including Foxboro) are identified below.

Construction in the Foxboro development was just beginning when the D&RG Tech Memo was being prepared. Because few homes existed at the time of the evaluation, no relocations were identified. Now new homes are being completed in this development every week, but even so, the methodology described above would not capture an alignment's full impact because many lots are still undeveloped. In addition, the D&RG alignments have the full 95-m ROW width in the area of Foxboro and other new developments. Table 1 lists the relocation impacts (from Table 3-1 in the D&RG Tech Memo) and the residential lots impacted by each D&RG conceptual alignment. Table 2 lists the relocations in Corridor Links 2 and 3.

Note that the evaluation does not consider the additional impacts of eliminating access to some locations or creating cul-de-sacs at dead-end streets. In addition, the evaluation does not consider the impact of a wider ROW that would accommodate frontage roads to provide access to some areas and avoid additional relocations.

**Table 1. Relocation Impacts**

<b>Alignment (ROW Width)</b>	<b>Identified Relocations</b>	<b>Residential Platted Lots<sup>a</sup></b>
DRG1 (80–95 m)	Residential–193 Business–86 <b>Total–279</b>	0
DRG2 (80–95 m)	Residential–196 Business–46 <b>Total–242</b>	Foxboro–70
DRG3 (80–95 m)	Residential–129 Business–39 <b>Total–168</b>	Mountain View–36
DRG4 (80–95 m)	Residential–128 Business–21 <b>Total–149</b>	Mountain View–36
DRG5 (80–95 m)	Residential–139 Business–20 <b>Total–159</b>	Mountain View–36

<sup>a</sup> None of the other platted developments are directly impacted by the D&RG conceptual alignments. Because some lots are not yet developed, a relocation may or may not be associated with an impact to a platted residential lot.

**Table 2. Relocations in Corridor Links 2 and 3**

<b>Alignment</b>	<b>Residential Displacements</b>		<b>Residential Platted Lots</b>	
	<b>Link 2</b>	<b>Link 3</b>	<b>Link 2</b>	<b>Link 3</b>
Alt. E	0	0	0	0
DRG1	0	189	0	0
DRG2	3	189	70	0
DRG3	0	125	0	36
DRG4	0	124	0	36
DRG5	0	135	0	36

**2. Section 3.1.3. Community Cohesion.**

Several of the D&RG conceptual alignments would bisect the newly platted developments. Conceptual alignment DRG2 would bisect the Foxboro development, causing a negative effect on this developing neighborhood. Similarly, conceptual alignments DRG3, DRG4, and DRG5 would bisect the Mountain View development. No homes currently exist in the Mountain View

development. If conceptual alignment DRG3, DRG4, or DRG5 were selected as a feasible or practicable alternative, the development plans would need to be changed to accommodate the highway and allow access to this area.

**3. Section 3.1.3, Community Cohesion, Table 3-3.**

The lengths of noise walls for the D&RG conceptual alignments were changed to address the need for noise abatement for the platted developments. Also revised is the total number of cul-de-sacs representing cut-off streets both existing and planned was revised. See Table 3. No additional relocations or platted lot impacts were associated with access changes and the addition of cul-de-sacs. Replace Figure 3-2 and Figure 3-4.

**Table 3. Community Impacts**

Alignment	Number of Bridges (Cross Streets)	Number of Cul-de-Sacs and Cut-Off Roads	Length of Noise Wall, m (ft) <sup>a</sup>	Length of Retaining Wall Not Including Termini Interchanges, m (ft) <sup>a</sup>
Alt. E	4	4	0 (0)	500 (1,640)
DRG1	12	14	10,604 (34,793)	4,921 (16,145)
DRG2	12	22	13,781 (45,216)	4,921 (16,145)
DRG3	10	13	7,445 (24,428)	3,829 (12,562)
DRG4	10	12	7,115 (23,345)	3,773 (12,379)
DRG5	10	12	7,635 (25,051)	3,149 (10,331)

<sup>a</sup> Estimates only. More detailed design would be required to determine the exact lengths.

**4. Section 3.1.3, Community Cohesion, descriptions of impacts to south Davis County communities, pages 36 and 37.**

*North Salt Lake.* The Davis County School District’s current plan is to construct a new elementary school in Foxboro to open in the fall of 2007 (Wood, personal communication, June 7, 2005). Schoolchildren in the Foxboro development living on the south side of DRG2 would need to cross the highway at one of the proposed surface street crossings, likely Redwood Road.

*Woods Cross.* Conceptual alignments DRG3, DRG4, and DRG5 would adversely affect the platted Mountain View development. If one of these alignments were constructed after homes were built, there would be a negative impact on community cohesion.

*West Bountiful.* The Birnam Woods development is currently somewhat isolated from the rest of West Bountiful. The D&RG railroad tracks bound the site to the east, and no other developments exist in the area. However, a new highway could give residents a greater feeling of isolation. In this location, all D&RG alignments would need to be elevated for the bridge that crosses Porter Lane. A retaining wall might also be required to keep highway fills within the established ROW. In addition, a noise wall might be required to abate noise impacts.

**5. Section 3.1.3, Community Cohesion, Table 3.6.**

Revise table to account for additional cul-de-sacs. See Table 4.

**Table 4. Changes to Travel Patterns Caused by Physical Barriers**

Alignment	Number of Bridges (Cross Streets)	Number of Cul-de-Sacs and Cut-Off Roads
Alt. E	4	4
DRG1	12	14
DRG2	12	22
DRG3	10	13
DRG4	10	12
DRG5	10	12

**6. Section 3.1.3, Community Cohesion, Table 3-7, Noise and Visual Impact Measures.**

As an alternative to quantifying the level of noise and visual impacts, the project team quantified the number of residential properties adjacent to the alignments. Unlike other areas of the D&RG study area that are built out, few homes currently exist in the area of these new developments, with the exception of Foxboro which is under construction. Table 5 lists the number of platted lots that would be adjacent to the D&RG conceptual alignments. Property owners created development plans with full knowledge of the location of Alternative E. Development plans show a buffer strip, a park or open space between the Alternative E alignment and residential lots, therefore, no new platted lots are located adjacent to Alternative E.

Replace Table 3-7 with the following table.

**Table 5. Noise and Visual Impact Measures.**

Alignment	Residential Platted Lots Adjacent to Alignment	Length of Noise Wall, m (ft) <sup>a</sup>	Length of Retaining Wall Not Including Termini Interchanges, m (ft) <sup>a</sup>
DRG1	No new developments impacted	10,604 (34,793)	4,921 (16,145)
DRG2	Foxboro–32	13,781 (45,216)	4,921 (16,145)
DRG3	Mountain View–26	7,445 (24,428)	3,829 (12,562)
DRG4	Mountain View–26	7,115 (23,345)	3,773 (12,379)
DRG5	Mountain View–26	7,635 (25,051)	3,149 (10,331)

<sup>a</sup> Estimates only. More detailed design would be required to determine the exact lengths

**7. Section 3.2, D&RG Wetland Impacts, 4th paragraph and Table 3-8.**

The D&RG Tech Memo states that the design-build contractor identified 14 acres of wetland impacts within the ROW that could be avoided. However, the updated design analysis for Alternative E as part of the Final Supplemental EIS shows that this savings would be about 10 acres. Replace 4th paragraph with the following:

Through final detailed design for Alternative E, UDOT determined that 10 acres of wetlands within the ROW—primarily in the north (Link 5) and south (Link 1) interchanges, where all of the D&RG alignments and Alternative E are the same—would not be impacted during construction. These interchange areas would be similar for all alignment alternatives because the design of the interchanges is based on the area needed

to accommodate the ramps that connect to the roadways, not on the entire ROW. Therefore, this 10-acre reduction of wetland impacts was applied to all alternatives.

For the D&RG conceptual alignments, the project team reduced the highway ROW in areas of existing development and wetland areas to determine the minimum number of impacts that could be expected. The resulting wetland impacts are the minimum number that can be expected for the D&RG alignments. See Table 6.

**Table 6. Wetland Impacts (in Acres)**

Alignment	Wetland Located within ROW	Difference from Alt. E Based on ROW	Wetland Impacts within Footprint <sup>a</sup>	Difference from Alt. E Based on Footprint
Alt. E	113	—	103	—
DRG1	105	-8	90	-13
DRG2	114	+1	97	-6
DRG3	111	-2	95	-8
DRG4	110	-3	94	-7
DRG5	106	-7	90	-13

<sup>a</sup> This includes the 10-acre reduction in wetland impacts identified by the design-build contractor for Alternative E, and applies to the D&RG conceptual alignments. The footprint impacts for the D&RG alignments include the savings associated with the use of the 80-m (264-ft) width in wetland areas and in areas of existing development.

8. **Section 3.2, 4th paragraph**, last 2 sentences referring to the wetland impacts of Alternative E and Footnote 9 should be deleted. Refer to ROW Technical Memorandum Addendum.
9. **Section 3.2, Table 3-9, Wetland Impacts in Links 2 and 3 (acres)**. Replace with the following table which reports wetland impacts in acres rounded to the nearest acre.

**Table 7. Wetland Impacts in Links 2 and 3 (in Acres)**

Alignment	Wetland Impacts in Link 2	Wetland Impacts in Link 3	Total Wetland Impacts in Links 2 and 3
Alt. E	9	29	38
DRG1	7	23	30
DRG2	18	21	39
DRG3	9	26	35
DRG4	9	25	34
DRG5	9	21	30

10. **Section 3.3, Alignment Specific Costs, Table 3-10, Table 3-11, and Table 3-12**. Replace with Table 8, Table 9, and Table 10 (respectively), which report the revised cost estimates.

**Table 8. Summary of Cost Estimates (in Millions)**

Regional Corridor	Final EIS Regional Estimate 2000	Regional Alignment Estimate 2004 <sup>a</sup>	Alignment-Specific Estimate 2005
Alternative E	\$300	\$439	\$442
D&RG	\$460	\$589	\$576 to \$698

<sup>a</sup> Estimates includes construction materials, right-of-way, and estimated wetland mitigation. Pre-award engineering, stipends, and incentives are items specific to the contract to construct the Legacy Parkway and were not included in the above estimates or the estimates in the Final EIS. These items were included in the total cost of the Legacy Parkway project (\$451 million) which was publicized after the Final EIS was published.

**Table 9. Alignment-Specific Costs**

Alignment	Length Varying from Alternative E (miles) <sup>a</sup>	Length along D&RG Railroad (miles)	Alignment-Specific Cost (millions) <sup>b</sup>	Cost Difference Alternative E (millions)	Percent Cost Increase over Alternative E
Alternative E	—	—	\$442	—	—
DRG1	6.2	4.5	\$698	\$256	58%
DRG2	6.2	3.6	\$665	\$223	50%
DRG3	4.5	2.5	\$596	\$154	35%
DRG4	4.4	2.2	\$578	\$136	31%
DRG5	4.3	1.5	\$576	\$134	30%

<sup>a</sup> This number is the length in miles that the D&RG conceptual alignments and Alternative E follow separate alignments. For the remainder of the 14 total miles of the North Corridor, the alternative alignments are identical.

<sup>b</sup> Estimates include construction materials, right-of-way, and estimated wetland mitigation but do not include items specific to the contract to construct the Legacy Parkway (pre-award engineering, stipends, and incentives).

**Table 10. Alignment-Specific Costs in Link 2 and 3**

Alignment	Link 2 (millions)	Link 3 (millions)	Total Cost for Links 2 and 3 (millions) <sup>a</sup>
Alternative E	\$23	\$80	\$103
DRG1	\$126	\$233	\$359
DRG2	\$92	\$233	\$325
DRG3	\$23	\$234	\$257
DRG4	\$23	\$216	\$239
DRG5	\$23	\$214	\$237

<sup>a</sup> The estimated cost of the conceptual alignments in Links 1, 4, and 5 is about \$339 million.

**11. Section 3.4, Summary of Impact, 2nd paragraph.** Replace paragraph with the following:

Of the links that vary among the alternatives, Link 3 has the largest amount of wetland impacts. Within this link, Alternative E would have 29 acres of wetland

impacts compared to about 21 to 26 acres for the D&RG conceptual alignments. Within Link 3, the D&RG alignments would save between 3 and 8 acres of wetlands at an additional cost of about \$134 million to \$154 million compared to Alternative E. Avoiding these 3 to 8 acres of wetland impacts would require between 124 and 189 more residential relocations and between 6 and 25 more business relocations.

**12. Section 3.4, Summary of Impact, 3rd paragraph.** Replace paragraph with the following:

In Link 2, only conceptual alignments DRG1 and DRG2 vary from Alternative E. Within this link, DRG1 would avoid 2 acres of wetlands compared to Alternative E (7 acres versus 9 acres). Avoiding these 2 acres of wetlands would require 51 additional business relocations (for DRG1) and would cost about \$103 million more than Alternative E. DRG2 would impact 9 more wetland acres than Alternative E (18 acres versus 9 acres). Within Link 2, DRG2 would have 3 residential and 11 business relocations and an estimated cost of \$126 million, or about \$69 million more than Alternative E.

**13. Section 3.4, Figure 3-6.**

Replace summary of impacts figure with attached Figure 3-6.

**14. Section 4.0, Summary and Conclusion, 2nd paragraph, last sentence.** Replace with the following:

The costs of the D&RG alignments range from \$576 million to \$698 million (\$134 million to \$256 million more than Alternative E).

**15. Section 4.0, Summary and Conclusion, 3rd paragraph, last sentence.** Replace with the following:

Because the D&RG alignments traverse directly through developed, established neighborhoods (as opposed to the western edge of development with Alternative E), they would have considerably more impacts to community cohesion (such as requiring between 12 and 22 cut-off roadways, compared to 4 for Alternative E).

**16. Section 4.0, Summary and Conclusion, 5th and 6th paragraphs.** Replace with the following:

The impacts in Links 2 and 3 are the only differences between the D&RG alignments and Alternative E. In Link 3, Alternative E would have between 3 and 8 more acres of wetland impacts than the D&RG conceptual alignments. The D&RG alignments have an estimated cost of \$134 million to \$154 million more than the estimated cost of Alternative E in this link. Residential relocations in Link 3 would range between 124 and 189 for the D&RG alignments compared to 0 for Alternative E. Business relocations would range between 7 and 24 for the D&RG alignments compared to 1 for Alternative E in this link. As shown in Tale 3-1 Table 1, the number of relocations for any of the D&RG alignments would be substantially higher than for Alternative E in Link 3.

In Link 2, only DRG1 and DRG2 differ from Alternative E. Within Link 2, DRG1 would have 51 business relocations and DRG2 would have 11, compared to 2 relocations for Alternative E. DRG1 would have 2 fewer acres of wetland impacts

compared to Alternative E (9 acres) at a cost of about \$103 million more than Alternative E in this link. DRG2 has more wetland impacts (18 acres) than Alternative E and would cost about \$69 million more than Alternative E in this link.

**17. Section 4, Table 4-1, Summary of Impacts.** Replace values with those in the following table.

**Table 11. Summary of Impacts**

Alignment	Cost	Wetlands		Impacts on Existing Development					
		Total Cost (millions)	Footprint (acres)	ROW (acres)	Relocations	Travel Patterns		Noise and Visual Impacts	
				No Change	Number of Bridges (Cross Streets)	Number of Cul-de-Sacs and Cut-Off Roads	Residential Properties Adjacent to ROW	Length of Noise Wall, m (ft)	Length of Retaining Wall Not Including Termini Interchanges, m (ft)
Alt. E	\$442	103	113		4	4	7	0 (0)	500 (1,640)
DRG1	\$712	90	105		12	14	125	10,604 (34,793)	4,921 (16,145)
DRG2	\$678	97	114		12	22	129	13,781 (45,216)	4,921 (16,145)
DRG3	\$610	95	111		10	13	115	7,445 (24,428)	3,829 (12,562)
DRG4	\$592	94	110		10	12	89	7,115 (23,345)	3,773 (12,379)
DRG5	\$590	90	106		10	12	114	7,635 (25,051)	3,149 (10,331)

**18. Section 4.0, 1st paragraph after table, 3rd sentence.** Replace with the following:

The fact that the D&RG alignments would cost between \$134 million and \$256 million more than Alternative E and would require 149 to 279 displacements (compared to 18 for Alternative E) makes the DR&G alignments impracticable from a cost standpoint given their significant adverse impacts.

**19. Section 4.0, 2nd paragraph after table, 1st sentence.** Replace with the following:

Moreover, based on more refined wetland identification, the 90 to 97 acres of wetland impacts within the footprints of the D&RG conceptual alignments (compared to the 103 acres for Alternative E) and the 105 to 114 acres of wetland impacts within the right-of-way (compared to 113 acres for Alternative E) would not now be characterized as “low” compared to the wetland impacts from the Great Salt Lake regional corridor, which was characterized as having “medium” impacts in the Final EIS.

**ATTACHMENT 1, Additional Information for the D&RG Regional Corridor Evaluation**

- 20. Section 3.2, Regional Corridor Cost Estimates, second paragraph after Table 3-1.** Contractor preaward engineering, incentives, and stipends should total \$33,500,000.
- 21. Section 5.6.2, Community Impacts Analysis, Table 5-10.**  
Change the displacement impacts of conceptual alignment DRG2 for the 62-m to 95-m ROW to **238 total, not 438.**
- 22. Section 6.1, Table 6-1.** Replace with the following table.

**Table 12. Alignment-Specific Costs for 80-m to 95-m (264-ft to 312-ft) Right-of-Way**

<b>Alignment (80 m to 95 m)</b>	<b>Alignment- Specific Cost (millions)</b>	<b>Cost Difference Alternative E (millions)</b>	<b>Percent Cost Increase over Alternative E</b>
Alt. E	\$442	—	—
DRG1	\$698	\$256	58%
DRG2	\$665	\$223	50%
DRG3	\$596	\$154	35%
DRG4	\$578	\$136	31%
DRG5	\$576	\$134	30%

- 23. Section 6.2, Heading.** Change to:

**62-m to 95-m (204-ft to 312-ft) Right-of-Way Width**

- 24. Section 6.2, Table 6-2.**

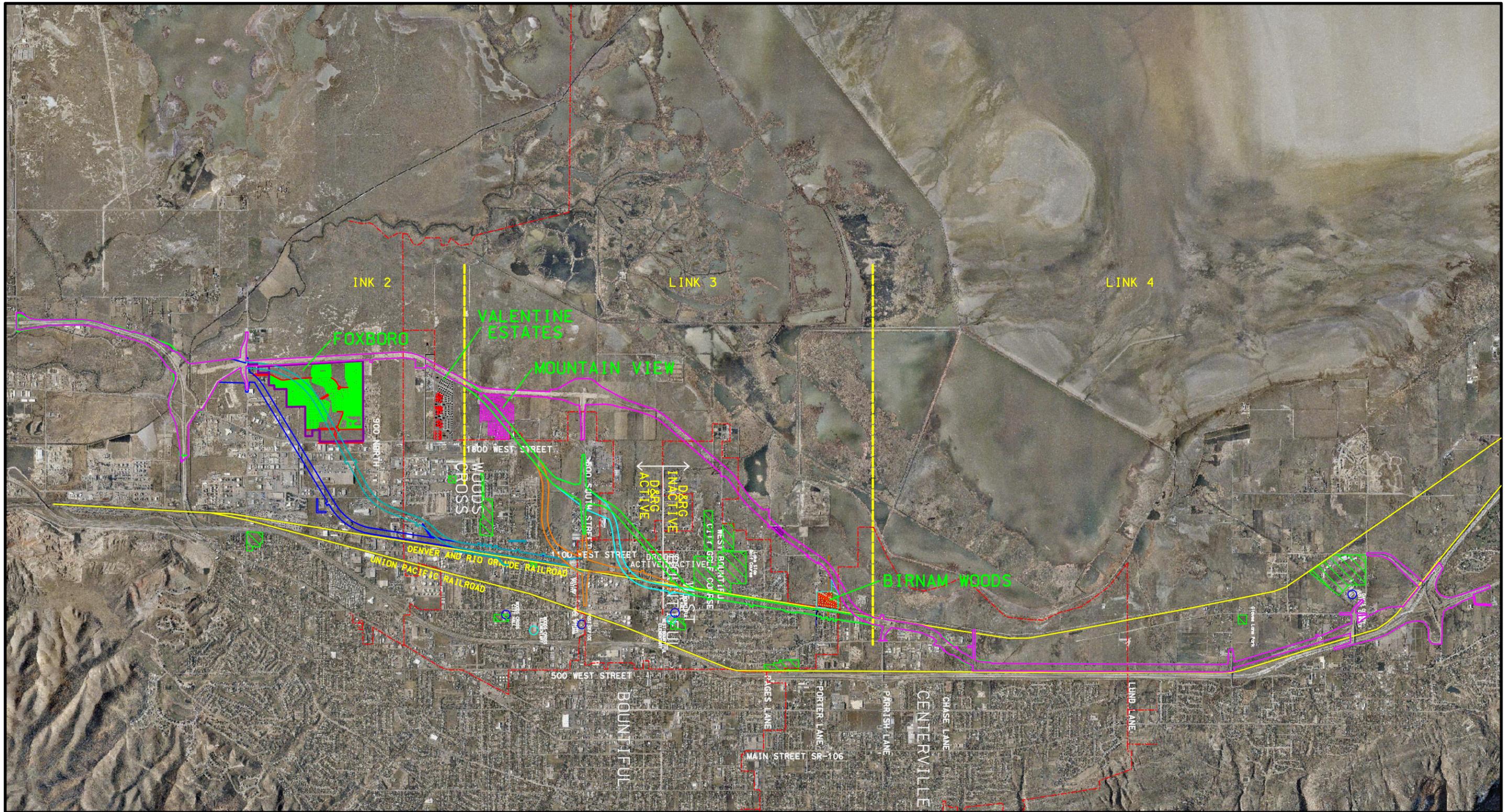
Note that the cost estimates were not revised for the 62-m to 95-m ROW width. Table 6-2 shows the cost difference between the previously mentioned ROW width and the 80-m to 95-m ROW width is negligible.

**ATTACHMENT 1, APPENDIX C, Alignment-Specific Cost Estimates (80-m to 95-m [264-ft to 312-ft] Right-of-Way Width)**

- 25. Conceptual Alignment Cost Estimate.**

The conceptual alignment cost estimates were revised to reflect current (2005) prices and were based on a review by FHWA’s Major Projects Division. Cost estimate are attached.

The figures for the cost estimate attachments were not changes and therefore are not amended by this document. The length of noise walls was increased to account for the impacts to the new residential developments. Updated noise wall locations are shown in attached Figure 3-2. With the exception of the noise wall lengths, no other cost estimate revision would required changing the figures in the cost estimate attachments.



**LEGEND**

- |   |                  |   |                           |
|---|------------------|---|---------------------------|
|  | DRG1             |  | JURISDICTIONAL BOUNDARIES |
|  | DRG2             |  | GOVERNMENT FACILITY       |
|  | DRG3             |  | PUBLIC FACILITY           |
|  | DRG4             |  | PARK                      |
|  | DRG5             |  | GOLF COURSE               |
|  | ALT E            |   |                           |
|  | LINK DESIGNATION |   |                           |
|  | RAILROAD         |   |                           |

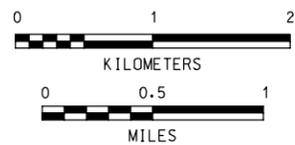
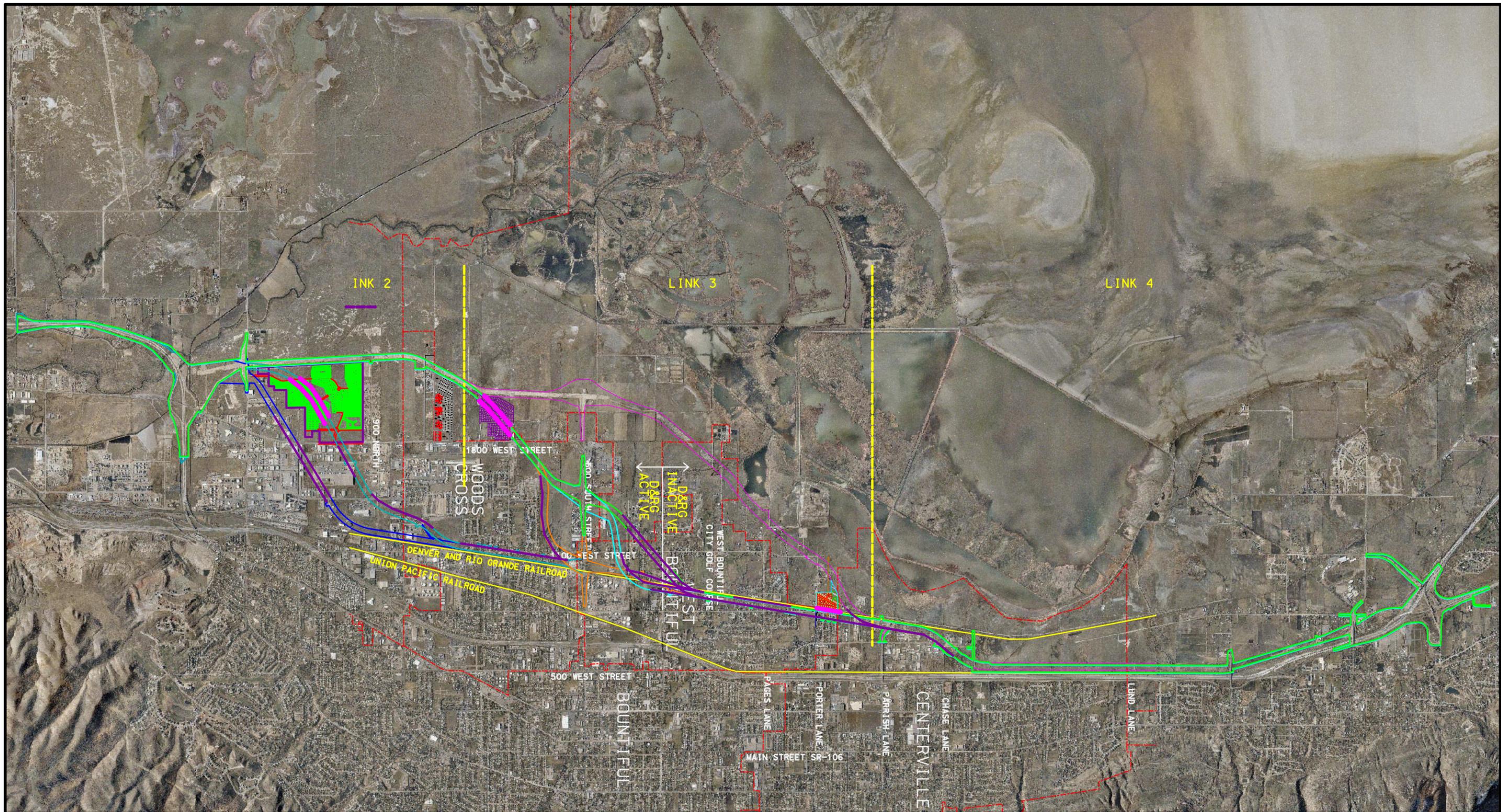


FIGURE 2-2

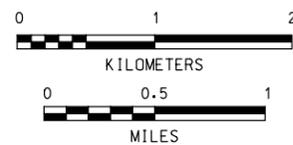
D&RG EXISTING DEVELOPMENT

LEGACY PARKWAY SUPPLEMENTAL EIS



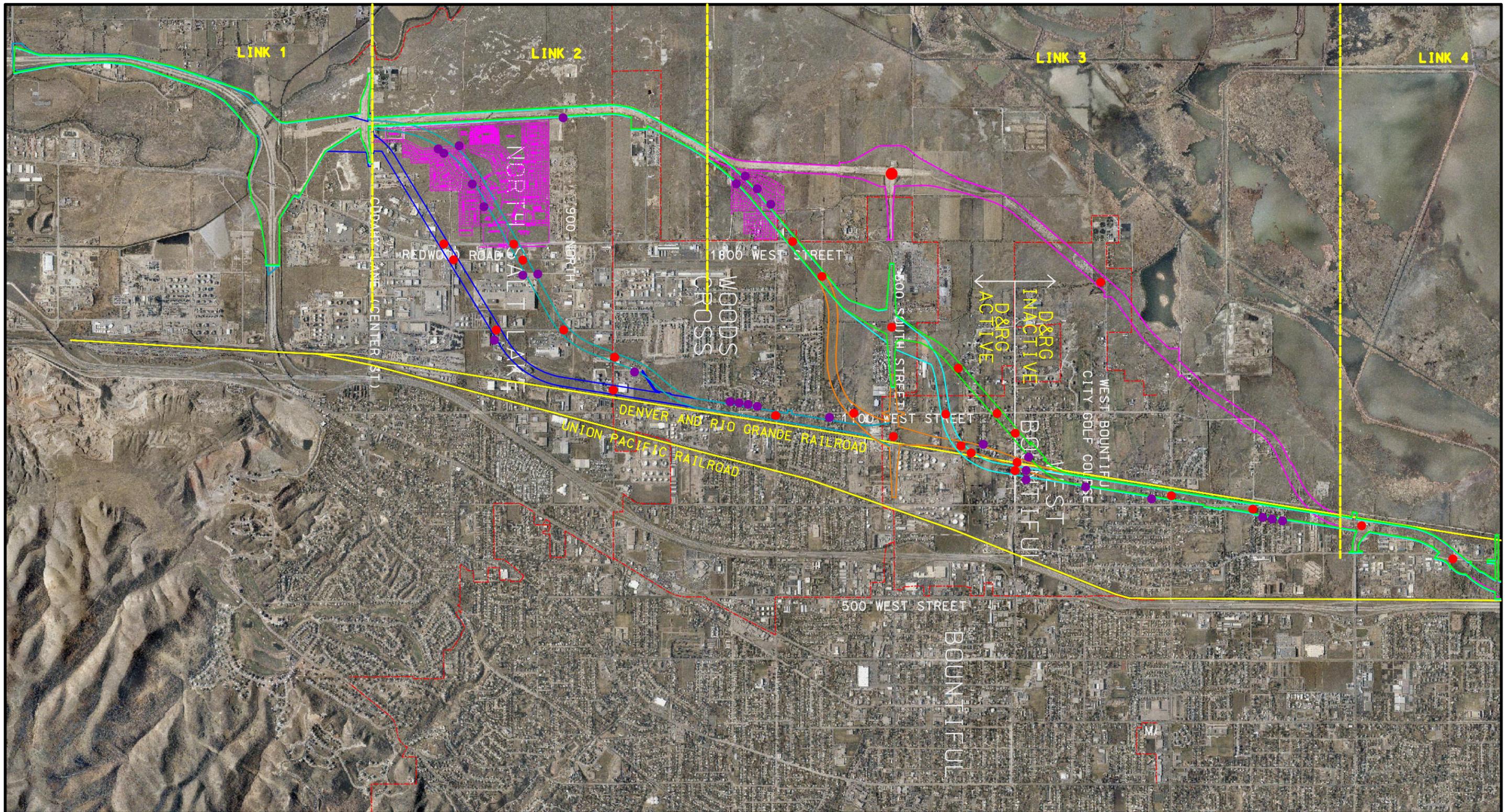
**LEGEND**

- |  |       |  |                           |
|--|-------|--|---------------------------|
|  | DRG1  |  | LINK DESIGNATION          |
|  | DRG2  |  | RAILROAD                  |
|  | DRG3  |  | JURISDICTIONAL BOUNDARIES |
|  | DRG4  |  | NOISE WALLS               |
|  | DRG5  |  | NOISE WALLS (UPDATED)     |
|  | ALT E |  |                           |



**FIGURE 3-2**

**NOISE WALLS**



**LEGEND**

- |   |       |   |                           |
|---|-------|---|---------------------------|
|  | DRG1  |  | LINK DESIGNATION          |
|  | DRG2  |  | RAILROAD                  |
|  | DRG3  |  | JURISDICTIONAL BOUNDARIES |
|  | DRG4  |  | BRIDGES                   |
|  | DRG5  |  | CUL-DE-SAC                |
|  | ALT E |   |                           |

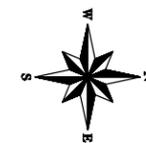
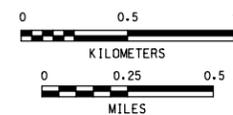
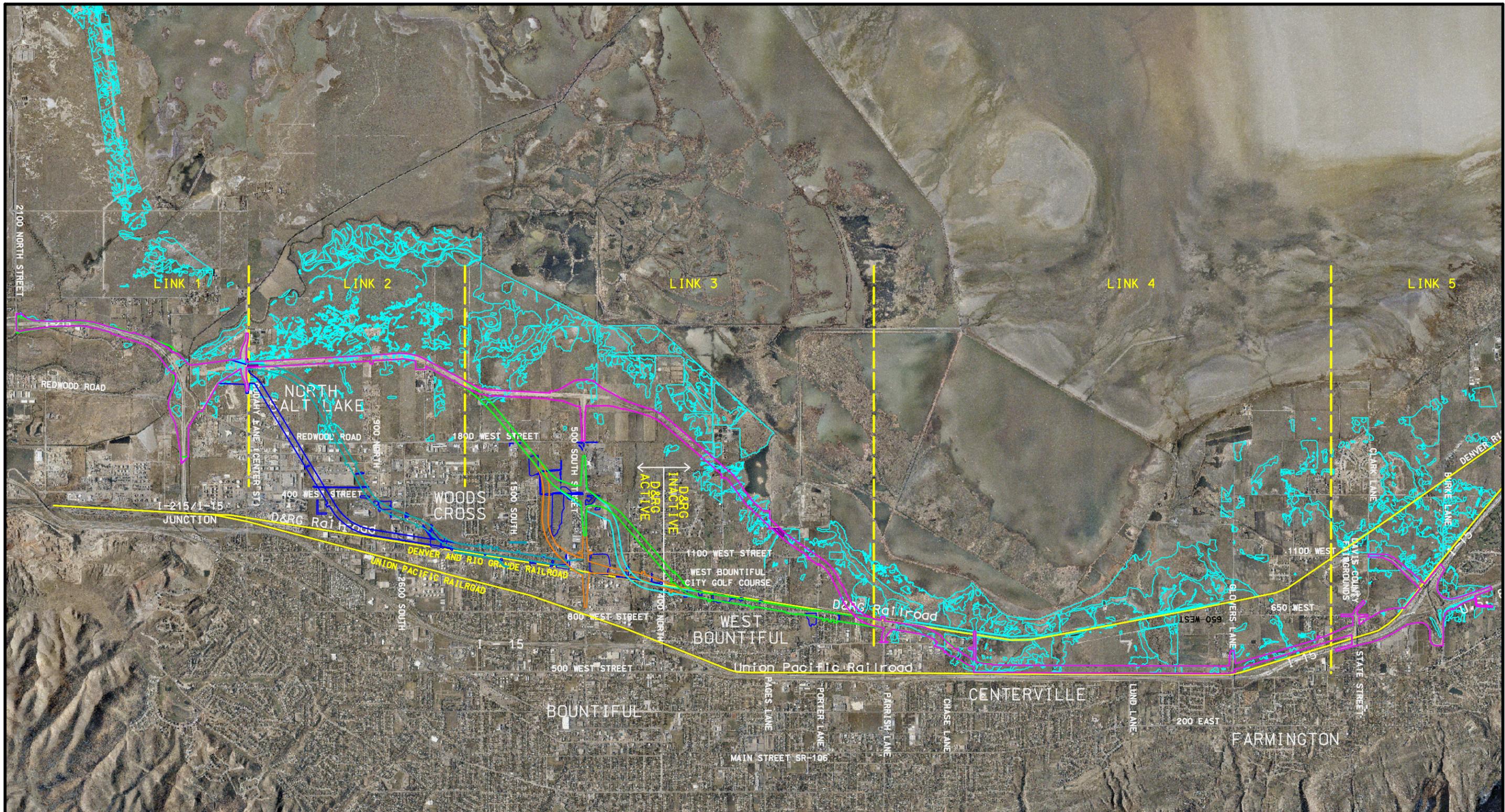


Figure 3-4

**BRIDGES AND CUL-DE-SACS**



**LEGEND**

- DRG1
  - DRG2
  - DRG3
  - DRG4
  - DRG5
  - ALT E
  - - - LINK DESIGNATION
  - RAILROAD
- ⬭ WETLAND
  - ⬭ WETLAND (D&RG CORRIDOR)

ALTERNATIVE	LINK1			
	RESIDENTIAL RELOCATIONS	BUSINESS RELOCATIONS	WETLANDS (ACRES)	COST (MILLIONS)
DRG1	0	0	20	71
DRG2	0	0	20	71
DRG3	0	0	20	71
DRG4	0	0	20	71
DRG5	0	0	20	71
ALT E	0	0	20	71

ALTERNATIVE	LINK2			
	RESIDENTIAL RELOCATIONS	BUSINESS RELOCATIONS	WETLANDS (ACRES)	COST (MILLIONS)
DRG1	0	51	7	126
DRG2	3	11	18	92
DRG3	0	2	9	23
DRG4	0	2	9	23
DRG5	0	2	9	23
ALT E	0	2	9	23

ALTERNATIVE	LINK3			
	RESIDENTIAL RELOCATIONS	BUSINESS RELOCATIONS	WETLANDS (ACRES)	COST (MILLIONS)
DRG1	189	24	23	233
DRG2	189	24	21	233
DRG3	125	26	26	234
DRG4	124	8	25	216
DRG5	135	7	21	214
ALT E	0	1	29	80

ALTERNATIVE	LINK4			
	RESIDENTIAL RELOCATIONS	BUSINESS RELOCATIONS	WETLANDS (ACRES)	COST (MILLIONS)
DRG1	2	5	41	93
DRG2	2	5	41	93
DRG3	2	5	41	93
DRG4	2	5	41	93
DRG5	2	5	41	93
ALT E	2	5	41	93

ALTERNATIVE	LINK5			
	RESIDENTIAL RELOCATIONS	BUSINESS RELOCATIONS	WETLANDS (ACRES)	COST (MILLIONS)
DRG1	2	6	14	176
DRG2	2	6	14	176
DRG3	2	6	14	176
DRG4	2	6	14	176
DRG5	2	6	14	176
ALT E	2	6	14	176

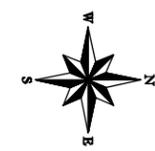
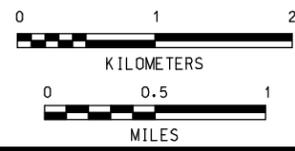


Figure 3-6

**LINK IMPACT SUMMARY**

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