

Appendix G
Updated Cost Estimates



Legacy Parkway Alternatives Cost Estimates Appendix

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1.0 Introduction

The Utah Department of Transportation (UDOT) prepared cost estimates for the Legacy Parkway project at several stages during the development of project alternatives and the alternative screening process. The cost estimates that were prepared at different stages of development became progressively more detailed as the alternatives were carried forward for further analysis. Therefore, the cost estimates became more refined.

This section describes the different stages of alternatives development and summarizes the cost-estimating methodology that was applied at each stage. The following sections (2.0 through 4.0) contain cost summaries for each alternative at a given stage. Detailed cost estimates were prepared from the information in the Supplemental Environmental Impact Statement (EIS). Detailed cost estimates with supporting documentation are found in the Legacy Parkway Technical Memorandum: Denver & Rio Grande Evaluation (HDR 2004). Detailed summaries of the cost estimates prepared for the Legacy Parkway build alternatives are found in this appendix.

1.1 Regional Corridors

The Final EIS evaluated five regional corridors in order to establish the preferred general location for a new highway through southern Davis County. For the Supplemental EIS, UDOT updated the cost estimates for all the regional corridors that were originally evaluated in the Final EIS: Antelope Island, Trans-Bay, Railroad (Union Pacific and Denver & Rio Grande), Farmington Bay, and Great Salt Lake. Of these, the Great Salt Lake regional corridor was selected as the preferred corridor and alternatives within this corridor were developed with greater detail for in-depth analysis.

Section 2.0 of this appendix summarizes the estimated costs of a highway facility within each of the regional corridors. The cost-estimating approach is at the planning level and uses a consistent methodology to determine the costs of and the cost differences between the various regional corridors.

1.2 Conceptual Highway Alignments

The Denver & Rio Grande (D&RG) Railroad corridor was eliminated from detailed analysis in the Final EIS because of the estimated cost and impacts to existing development. However, the Tenth Circuit Court of Appeals ruled that these conclusions were not adequately supported in the Final EIS (*Utahns for Better Transportation et al. v. U.S. Department of Transportation et al.* [305 F.3d

1152 (10th Cir. 2002)]. To address the Court's concerns, and because of public interest, lead federal agencies directed UDOT to evaluate the D&RG corridor in greater detail than the other regional corridors eliminated from detailed analysis.

To determine the range of impacts that could be expected for a highway in the D&RG regional corridor, and to ensure that a reasonable range of feasible alternatives was considered, five conceptual highway alignments were established in the D&RG corridor.

The cost estimates applied a consistent methodology to determine the costs of and the cost differences between the five conceptual D&RG alignments and a conceptual alignment within the Great Salt Lake corridor. Conceptual Alignment E was used to represent a highway within the Great Salt Lake regional corridor. These alignments were conceptual in nature and did not contain the same level of detail as the build alternatives presented in the Final EIS. The development of the conceptual alternatives enabled an equitable comparison between alternatives within the D&RG and Great Salt Lake regional corridors. Development of conceptual alignments also provided data on the accuracy of cost estimates prepared at the regional corridor level.

See Section 3.0 of this appendix and the Legacy Parkway Technical Memorandum: Denver & Rio Grande Evaluation (HDR 2004) for detailed information.

1.3 Legacy Parkway Build Alternatives

The Great Salt Lake regional corridor was carried forward for detailed analysis in the Final EIS. The Legacy Parkway build alternatives were developed in this corridor, and this corridor became the main study area for the Affected Environment chapter of the Final EIS. Four build alternatives (Alternatives A, B, C and the Preferred Alternative [Alternative D/E in the Supplemental EIS]) were evaluated in detail in the Final EIS. To provide a more accurate determination of environmental impacts and the expected costs, preliminary engineering design was conducted for these alternatives. The cost-estimating approach at this stage of alternatives development used a consistent methodology, with a more detailed level of design, to estimate the costs of and the cost differences between the build alternatives. See Chapter 3, Alternatives, of the Supplemental EIS for a description of the alternatives that were analyzed in detail.

1.4 Legacy Parkway and Preserve Project Budget

The Legacy Parkway and Preserve project budget includes all costs associated with the project. Cost items include highway construction (materials and labor

costs), property acquisitions for the highway right-of-way and mitigation land (Legacy Nature Preserve), and wetland-enhancement activities. These items are included in the regional corridor, conceptual alignment, and build alternative cost estimates described above. In addition, the project budget includes environmental analysis, public involvement, construction program management and environmental compliance oversight (includes UDOT personnel, consultants, and legal council), project risk and inflation contingencies, and contractor preaward engineering and incentives. These items were not included in regional corridor, conceptual alignment, or build alternative cost estimates, which were prepared to compare alternatives at the regional level and at alignment specific stages of development. Therefore, it is not appropriate to directly compare the project budget to the cost estimate prepared for any alternative regional corridor or alignment.

Section 5.0 of this appendix presents the total project budget and how it relates to the preliminary engineering cost estimate prepared for the Final EIS Preferred Alternative and the Supplemental EIS Alternative E.

1.5 Federal Agency Review

The Federal Highways Administration (FHWA) Major Projects Unit assembled a project review team of FHWA, UDOT, and consultants to review cost estimates prepared for conceptual alignments within the D&RG regional corridor (conceptual alignments DRG4 and 5) and the Legacy Parkway build alternatives (Alternatives A and E). The objective of this review was to verify the accuracy and reasonableness of the cost estimates and to validate that the cost estimates represent the project scope given different stages of alternative designs.

The review team analyzed each element of the alternative's cost estimates to assess whether they properly represented the current project scope and local market conditions. The review team concluded that the current project cost estimates are consistent with the level of the design for each alternative, and are based on sound estimating practices and assumptions. The recommendations of the review team were incorporated into the cost estimates for the conceptual alignments and the build alternatives, which were revised after the Draft Supplemental EIS to reflect 2005 prices.

The regional corridors cost estimates were not updated because more detailed cost estimates were prepared for alignments within the Great Salt Lake and D&RG, which are the two main regional corridors being evaluated. The regional corridor cost estimates, therefore, reflect 2004 prices.

2.0 Regional Corridors Cost Estimates

This section presents cost estimates prepared for the regional corridors. UDOT updated the cost estimates for the regional corridors that were originally evaluated in the Final EIS: Antelope Island, Trans-Bay, Railroad (Union Pacific and Denver & Rio Grande), Farmington Bay, and Great Salt Lake. The planning-level cost estimates for the regional corridors have been updated to reflect 2004 dollars. Additional information and a comparison of the cost differences between the Great Salt Lake and D&RG regional corridors are provided in the Legacy Parkway Technical Memorandum: Denver & Rio Grande Corridor Evaluation, Attachment 1 (HDR 2004).

The cost estimates for the regional corridors (Table 2-1) are not alignment-specific construction estimates, but are based on the approximate length of a highway within each regional corridor and material unit costs derived from recent UDOT projects. No highway rights-of-way or highway footprints were created in preparation of the regional corridor cost estimates. UDOT's engineering staff and its consultants used their best professional judgment and the best available current information to update these estimates.

Table 2-1. Regional Corridor Cost Estimates

Regional Corridor	2004 Cost Estimate (millions)
Great Salt Lake	\$439
Denver & Rio Grande	\$589
Farmington Bay	\$830
Antelope Island	\$1,525
Union Pacific	\$1,702
Trans-Bay	\$1,868

Detailed estimates are included in the Legacy Parkway Technical Memorandum: Denver & Rio Grande Corridor Evaluation, Attachment 1 (HDR 2004).

3.0 Conceptual Alignments Cost Estimates

The conceptual alignments were the second stage of alternative development, with the first stage being the evaluation of the six regional corridors. To place the conceptual D&RG alignments within the D&RG regional corridor, the project team used aerial photography that showed the major physical constraints in the corridor (refineries, developments, public facilities, and large wetland areas). This approach provided more detail for the conceptual alignment cost estimates, or “alignment-specific” cost estimates, compared to the regional corridor estimates.

However, the conceptual alignments are less detailed than the Legacy Parkway build alternative alignments which used survey information (elevation contours and detailed surface constraints) and preliminary highway design to establish highway footprints for detailed impacts analysis and initial construction quantities. More information on the build alternatives is provided in Section 4.0 of this appendix. The criteria and methodology used to develop the D&RG conceptual alignments and Conceptual Alignment E are described in the Legacy Parkway Technical Memorandum: Denver & Rio Grande Evaluation (HDR 2004).

The project team applied a consistent methodology to determine the costs of and the cost differences between the five conceptual D&RG alignments and a conceptual alignment within the Great Salt Lake corridor (Conceptual Alignment E). These alignments provided an approximate right-of way but are conceptual in nature and do not include the same level of engineering design as the Legacy Parkway build alternatives presented in the Final EIS. A summary of the cost estimates for the conceptual alignments is presented in Table 3-1.

Table 3-1. Conceptual Alignment Cost Estimates

Alignment	Alignment-Specific Cost (millions)
Conceptual Alignment E	\$ 442
DRG1	\$ 698
DRG2	\$ 665
DRG3	\$ 596
DRG4	\$ 578
DRG5	\$ 576

Material quantity projections and more detailed pricing information is included in the Legacy Parkway Technical Memorandum: Denver & Rio Grande Evaluation, Attachment 1, Appendix C (HDR 2004).

Table 3-2 shows the conceptual alignment cost estimates compared to the estimates developed using a regional corridor-level approach.

Table 3-2. Cost Estimates Comparison (in millions)

Alternative	Regional Corridor Estimate 2004	Conceptual Alignment Estimate 2005
Great Salt Lake	\$439	\$ 442
D&RG	\$589	\$576 to \$698

The cost estimates for the D&RG conceptual alignments (using an average cost of \$623 million) and Conceptual Alignment E are within about 6% and 1% of the cost estimates prepared for the D&RG and Great Salt Lake regional corridors, respectively. This is a reasonable degree of accuracy given the level of detail used in preparing the regional corridor cost estimates.

4.0 Legacy Parkway Build Alternatives Cost Estimates

Four build alternatives (Alternatives A, B, C and the Preferred Alternative [Alternative D/E in the Supplemental EIS]) were developed within the Great Salt Lake regional corridor and were evaluated in detail in the Final EIS and Supplemental EIS. To accurately determine environmental impacts and anticipated costs, preliminary engineering design was conducted for these alternatives. In contrast to the conceptual D&RG alignments, which were placed using aerial photography, the project team used survey information (elevation contours, utility surveys, wetland delineations, and other detailed surface constraints) to design preliminary highway footprints and determine preliminary construction quantities for the build alternative alignments.

The cost-estimating approach at this stage of alternatives development uses a consistent methodology to estimate the costs of and the cost differences between the Legacy Parkway build alternatives. Table 4-1 presents the estimated cost of the build alternatives.

Table 4-1. Cost Estimates for Legacy Parkway Build Alternatives

Alternative	Estimated Cost 2005 (millions)
Alternative A	\$ 479
Alternative B	\$ 548

Alternative	Estimated Cost 2005 (millions)
Alternative C	\$ 470
Alternative D	\$ 440
Alternative E	\$ 436

Table 4-2 through Table 4-6 below present the cost estimate summaries for each of the build alignments evaluated.

The cost estimates prepared for build Alternatives A, D, and E include a cost savings item "Option 1." Option 1 is a change proposed by the design-build contractor at the Legacy Parkway interchange at Parrish Lane and the crossing of the D&RG railroad tracks in Centerville. Implementing this option changed the design to cross the D&RG railroad at grade, as well as crossing Parrish Lane and 1250 West at grade, saving \$17.4 million. Parrish Lane and 1250 West would cross over the Legacy Parkway. Option 1 does not apply to the other build alternatives.

Table 4-2. Alternative A Cost Estimate

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (MILLIONS)
Concrete Pavement	775,744	M2	\$50	\$38.79
Asphalt Pavement	196,018	M2	\$32.50	\$6.38
Trail Pavement	56,145	M2	\$14	\$7.90
Structures	60,188	M2	\$1,400	\$84.27
Box Culverts-Steel	618,989	KG	\$1.45	\$0.90
Box Culverts-Concrete	6,973	M3	\$425	\$2.97
Retaining Wall	33,241	M2	\$375	\$12.47
Noise Wall	5,517	M	\$350	\$2.00
Earthwork	8,266,685	M3	\$9.80	\$81.02
Geotextile Material	456,729	M2	\$1.25	\$0.58
Armoring	0	M3	\$54.00	\$0
Catch Basins	268	EA	\$1,800	\$0.49
48" RCP (Reinforced Concrete Pipe)	3,329	M	\$238	\$0.80
36" RCP	420	M	\$160	\$0.07
24" RCP	26,773	M	\$110	\$2.95
Signing (Regulatory & Guide)	1	LUMP		\$2.00
Striping	440,454	M	\$1.50	\$0.67
Fence	77,719	M	\$29	\$2.26
Barrier	26,678	M	\$125	\$3.34
Demolition	1	LUMP		\$1.47
Traffic Control	1	LUMP		\$2.06
Landscaping	1	LUMP		\$9.70
Lighting	1	LUMP		\$1.60
Major Utility Relocation	1	LUMP		\$11.67
ATMS	1	LUMP		\$5.64
Option 1	1	LUMP		(\$17.40)
MATERIALS SUBTOTAL				\$257.49
Landfill Relocation	1	LUMP		\$0
Environmental Remediation	1	LUMP		\$2.25
Right of Way	1	LUMP		\$85.16
Right of Way Contingency (15%)				\$12.9
Wetlands Mitigation	1	LUMP		\$23.00
Wetland Maintenance	1	LUMP		\$1.00
Wetland Enhancements	1	LUMP		\$1.00
Miscellaneous Items (5%)				\$12.88
Mobilization (6%)				\$15.45
Contingencies (10%)				\$25.75
Engineering (15%)				\$38.63
Utilities (1%)				\$2.58
TOTAL				\$478.93
ROUNDED TOTAL (million)				\$479

Table 4-3. Alternative B Cost Estimate

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (MILLIONS)
Concrete Pavement	1,297,175	M2	\$50	\$64.86
Asphalt Pavement	254,526	M2	\$32.50	\$8.28
Trail Pavement	56,520	M2	\$14	\$0.80
Structures	54,722	M2	\$1,400	\$76.62
Box Culverts-Steel	618,989	KG	\$1.45	\$0.90
Box Culverts-Concrete	6,9723	M3	\$425	\$2.97
Retaining Wall	33,241	M2	\$375	\$12.47
Earthwork	10,685,851	M3	\$9.80	\$104.73
Geotextile Material	790,816	M2	\$1.25	\$0.99
Armoring	25,817	M3	\$54.00	\$1.40
Catch Basins	329	EA	\$1,800	\$0.60
48" RCP (Reinforced Concrete Pipe)	3,329	M	\$238	\$0.80
36" RCP	420	M	\$160	\$0.07
24" RCP	31,219	M	\$110	\$3.44
Signing (Regulatory & Guide)	1	LUMP		\$2.00
Striping	609,228	M	\$1.50	\$0.92
Fence	100,916	M	\$29	\$2.93
Barrier	34,100	M	\$125	\$4.27
Demolition	1	LUMP		\$1.47
Traffic Control	1	LUMP		\$2.47
Landscaping	1	LUMP		\$9.70
Lighting	1	LUMP		\$1.60
Major Utility Relocation	1	LUMP		\$15.49
ATMS	1	LUMP		\$6.77
Option 1	1	LUMP		0
MATERIALS SUBTOTAL				\$326.55
Landfill Relocation	1	LUMP		\$1.30
Environmental Remediation	1	LUMP		\$1.50
Right of Way	1	LUMP		\$52.00
Right of Way Contingency (15%)				\$7.80
Wetlands Mitigation	1	LUMP		\$35.50
Wetland Maintenance	1	LUMP		\$1.00
Wetland Enhancements	1	LUMP		\$1.00
Miscellaneous Items (5%)				\$16.33
Mobilization (6%)				\$19.60
Contingencies (10%)				\$32.66
Engineering (15%)				\$48.99
Utilities (1%)				\$3.27
TOTAL				\$547.50
ROUNDED TOTAL (million)				\$548

Table 4-4. Alternative C Cost Estimate

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (MILLIONS)
Concrete Pavement	1,009,696	M2	\$50	\$50.49
Asphalt Pavement	198,118	M2	\$32.50	\$6.44
Trail Pavement	58,038	M2	\$14	\$0.82
Structures	58,245	M2	\$1,400	\$81.55
Box Culverts-Steel	618,989	KG	\$1.45	\$0.90
Box Culverts-Concrete	6,973	M3	\$425	\$2.97
Retaining Wall	33,241	M2	\$375	\$12.47
Earthwork	8,317,658	M3	\$9.80	\$81.52
Geotextile Material	621,658	M2	\$1.25	\$0.78
Armoring	25,817	M3	\$54.00	\$1.40
Catch Basins	269	EA	\$1,800	\$0.49
48" RCP (Reinforced Concrete Pipe)	3,329	M	\$238	\$0.80
36" RCP	420	M	\$160	\$0.07
24" RCP	25,583	M	\$110	\$2.82
Signing (Regulatory & Guide)	1	LUMP		\$2.00
Striping	445,746	M	\$1.50	\$0.67
Fence	78,551	M	\$29	\$2.28
Barrier	33,305	M	\$125	\$4.17
Demolition	1	LUMP		\$1.47
Traffic Control	1	LUMP		\$2.06
Landscaping	1	LUMP		\$9.70
Lighting	1	LUMP		\$1.60
Major Utility Relocation	1	LUMP		\$11.22
ATMS	1	LUMP		\$5.64
Option 1	1	LUMP		0
MATERIALS SUBTOTAL				\$284.33
Landfill Relocation	1	LUMP		\$1.30
Environmental Remediation	1	LUMP		\$1.75
Right of Way	1	LUMP		\$43.00
Right of Way Contingency (15%)				\$6.45
Wetlands Mitigation	1	LUMP		\$26.00
Wetland Maintenance	1	LUMP		\$1.00
Wetland Enhancements	1	LUMP		\$1.00
Miscellaneous Items (5%)				\$14.22
Mobilization (6%)				\$17.06
Contingencies (10%)				\$28.44
Engineering (15%)				\$42.65
Utilities (1%)				\$2.85
TOTAL				\$470.05
ROUNDED TOTAL (million)				\$470

Table 4-5. Alternative D Cost Estimate

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (MILLIONS)
Concrete Pavement	901,367	M2	\$50	\$45.07
Asphalt Pavement	194,940	M2	\$32.50	\$6.34
Trail Pavement	57,198	M2	\$14	\$0.81
Structures	49,513	M2	\$1,400	\$69.32
Box Culverts-Steel	618,989	KG	\$1.45	\$0.90
Box Culverts-Concrete	6,973	M3	\$425	\$2.97
Retaining Wall	33,241	M2	\$375	\$12.47
Earthwork	8,521,508	M3	\$9.80	\$83.52
Geotextile Material	507,476	M2	\$1.25	\$0.64
Armoring	0	M3	\$54	\$0
Catch Basins	287	EA	\$1,800	\$0.52
48" RCP (Reinforced Concrete Pipe)	3,329	M	\$238	\$0.80
36" RCP	420	M	\$160	\$0.070
24" RCP	27,413	M	\$110	\$3.02
Signing (Regulatory & Guide)	1	LUMP		\$2.00
Striping	465,301	M	\$1.50	\$0.70
Fence	77,291	M	\$29	\$2.25
Barrier	26,678	M	\$125	\$3.34
Demolition	1	LUMP		\$1.47
Traffic Control	1	LUMP		\$2.06
Landscaping	1	LUMP		\$9.70
Lighting	1	LUMP		\$1.60
Major Utility Relocation	1	LUMP		\$13.15
ATMS	1	LUMP		\$5.56
Option 1	1	LUMP		(\$17.40)
MATERIALS SUBTOTAL				\$250.96
Landfill Relocation	1	LUMP		\$1.30
Environmental Remediation	1	LUMP		\$2.25
Right of Way	1	LUMP		\$63.96
Right of Way Contingency (5%)				\$3.20
Wetlands Mitigation	1	LUMP		\$23.00
Wetland Maintenance	1	LUMP		\$1.00
Wetland Enhancements	1	LUMP		\$1.00
Miscellaneous Items (5%)				\$12.55
Mobilization (6%)				\$15.06
Contingencies (10%)				\$25.10
Engineering (15%)				\$37.65
Utilities (1%)				\$2.51
TOTAL				\$439.54
ROUNDED TOTAL (million)				\$440

Table 4-6. Alternative E Cost Estimate

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (MILLIONS)
Concrete Pavement	901,367	M2	\$50	\$45.07
Asphalt Pavement	194,940	M2	\$32.50	\$6.34
Trail Pavement	57,198	M2	\$14	\$0.81
Structures	49,513	M2	\$1,400	\$69.32
Box Culverts-Steel	618,989	KG	\$1.45	\$0.90
Box Culverts-Concrete	6,973	M3	\$425	\$2.97
Retaining Wall	33,241	M2	\$375	\$12.47
Earthwork	8,265,862	M3	\$9.80	\$81.01
Geotextile Material	482,102	M2	\$1.25	\$0.61
Armoring	0	M3	\$54	\$0
Catch Basins	289	EA	\$1,800	\$0.52
48" RCP (Reinforced Concrete Pipe)	3,329	M	\$238	\$0.80
36" RCP	420	M	\$160	\$0.07
24" RCP	27,413	M	\$110	\$3.02
Signing (Regulatory & Guide)	1	LUMP		2.00
Striping	465,301	M	\$1.50	\$0.70
Fence	77,291	M	\$29	\$2.25
Barrier	26,678	M	\$125	\$3.34
Demolition	1	LUMP		\$1.47
Traffic Control	1	LUMP		\$2.06
Landscaping	1	LUMP		\$9.70
Lighting	1	LUMP		\$1.60
Major Utility Relocation	1	LUMP		\$13.15
ATMS	1	LUMP		\$5.64
Option 1	1	LUMP		(\$17.40)
MATERIALS SUBTOTAL				\$248.42
Landfill Relocation	1	LUMP		\$1.30
Environmental Remediation	1	LUMP		\$2.25
Right of Way	1	LUMP		\$63.96
Right of Way Contingency (5%)				\$3.20
Wetlands Mitigation	1	LUMP		\$23.00
Wetland Maintenance	1	LUMP		\$1.00
Wetland Enhancements	1	LUMP		\$1.00
Miscellaneous Items (5%)				\$12.43
Mobilization (6%)				14.91
Contingencies (10%)				\$24.85
Engineering (15%)				\$37.27
Utilities (1%)				\$2.49
TOTAL				\$436.08
ROUNDED TOTAL (million)				\$436

5.0 Legacy Parkway and Preserve Project Budget

The Legacy Parkway and Preserve project budget includes all costs associated with the project. The regional corridor, conceptual alignment, and build alternative cost items include only the cost for highway construction (materials and labor costs), property acquisitions for the highway right-of-way and mitigation land (Legacy Nature Preserve), and wetland enhancement activities. The cost estimates also include contingencies for inaccurate material quantity projections. See Section 6.0 for more information. The project budget items include environmental analysis, public involvement, construction program management and environmental compliance oversight (includes UDOT personnel, consultants, and legal council), an overall project risk and inflation contingency, and contractor preaward engineering and incentives.

Table 5-1 presents the total project budget and how it relates to the preliminary engineering cost estimates prepared for the Legacy Parkway build alternatives. The Final EIS Preferred Alternative and Alternative E are used in Table 5-1 to calculate the 2000 and 2005 budgets, respectively.

Table 5-1. Total Project Budget

Category	FEIS 2000 Budget (2000 dollars) (Millions)	SEIS 2005 Budget (2004 dollars) (Millions)
Engineer's cost estimate (construction)	\$369	\$ 436
Program management and environmental analysis and oversight	\$23	\$28
Contractor incentives (budgeted)	\$11	\$12
Subtotal	\$403	\$ 476
Project risk and inflation contingency ^a	\$65	\$ 111
Cost for construction delay ^b	0	\$98
Total^c	\$468	\$685

^a Included to account for construction material price increases and labor cost increases in the year of expenditure (inflation) and project risk elements including higher-than-expected contractor bids and other unforeseen conditions or issues.

^b Cost of delay includes prior project management, construction oversight, Legacy Nature Preserve site management, and environmental analysis (prior to the Supplemental EIS [\$23 million]); construction delays and contractor damages, contractor incentives spent, and attorney fees.

^c Under the 2000 budget Option 1 resulted in a \$17 million cost savings and a total project budget of \$451 million. Option 1 is accounted for in the 2005 budget in the engineers cost estimate figure (\$436 million).

Most state funding for transportation in Utah comes from the State Transportation Fund and the Centennial Highway Fund. The Legacy Parkway and Preserve project is being funded by the Centennial Highway Fund, which is an 11-year allocation of state and federal money. The Centennial Highway Fund is used for major highway projects not funded by the Transportation Fund—specifically, for transportation expansion projects. The original allocation from the Centennial Highway Fund for the Legacy Parkway and Preserve project was \$468 million (the project budget as reported in the court case was \$451 million which resulted from the cost savings associated with the UDOT’s acceptance of Option 1, see section 4.0). To cover project expenditures and future project costs, the State of Utah appropriated an additional \$217 million to arrive at the total project budget shown above in Table 5-1 (\$685 million).

The difference between the engineer’s cost estimate (\$436 million) and the total project budget (\$685 million) is \$249 million. With some limitations, this value could be added to any of the estimated costs of the build alternatives or conceptual alignments to yield an approximate project budget for a given alternative. For example, the Alternative A estimate of \$479 million plus \$249 million, results in a project budget of \$ 728 million. Another example, using DRG5 at \$576 million plus \$249, gives a total project budget of \$825 million.

One notable limitation is that property has already been acquired for much of the Alternative E right-of-way and the Legacy Nature Preserve. If a new alignment is selected, there could be additional costs associated with conducting new appraisals, court costs, accounting, administrative, and legal fees to resell property already purchased.

For Alternative B, calculating the total project budget might require a larger value given the additional length of this alternative. Similarly, because of the conceptual nature of the alignments within the D&RG regional corridor, calculating the total project budgets for these alignments might justify larger project risk contingency factors than those included in the project budget for Alternative E. Additional time would be needed to conduct a more in depth environmental analysis and complete the final design and contractor bidding processes which would add to the inflationary costs of the alternatives within the D&RG regional corridor.

6.0 Summary

Table 6-1 summarizes the cost estimates presented in the previous sections. The cost estimates in Table 6-1 are listed from the less-detailed regional corridors to the progressively more-detailed stages of alternatives development (conceptual alignments and build alternatives). The total 2005 project budget is also included.

Table 6-1. Summary of Cost Estimate

Alternative	Estimated Cost (millions)
Regional Corridors	
Great Salt Lake	\$439
Denver & Rio Grande	\$589
Farmington Bay	\$830
Antelope Island	\$1,525
Union Pacific	\$1,702
Trans-Bay	\$1,868
Conceptual Alignments	
Conceptual Alternative E (in Great Salt Lake corridor)	\$ 442
DRG1 (in D&RG corridor)	\$ 698
DRG2 (in D&RG corridor)	\$ 665
DRG3 (in D&RG corridor)	\$ 596
DRG4 (in D&RG corridor)	\$ 578
DRG5 (in D&RG corridor)	\$ 576
Build Alternatives	
Alternative A	\$ 479
Alternative B	\$ 548
Alternative C	\$ 470
Alternative D	\$ 440
Alternative E	\$ 436
2005 Project Budget	
Alternative E	\$685

When preparing cost estimates, it is standard practice to apply contingencies to the materials cost subtotal in proportion to the level of detail provided for each alternative. As more detail is obtained (at increasing levels of alternative development) a lower contingency can be applied. The materials cost contingencies used in the Legacy project cost estimates are as follows:

- Regional Corridors (planning level) – 25%
- Conceptual Alignments (more defined location) –15% (Alternative E) and 22% (D&RG¹)
- Build Alternatives (preliminary engineering design) – 10%

Table 6-2 presents the cost estimates prepared for Alternative E at each stage of development. Table 6-2 presents the estimates beginning with the alternative with the most engineering design (Build Alternative E) to the estimate with the least amount of detail (Great Salt Lake regional corridor).

Table 6-2. Summary of Cost Estimates Representing Alternative E

Stage of Development	Cost Estimate (millions)	Difference from Build Alternative Estimate (%)
Build Alternative E (preliminary design)	\$ 436	N/A
Conceptual Alignment E	\$ 442	+ 1.4%
Great Salt Lake regional corridor	\$439	+ 0.7%

Table 6-2 shows that the cost estimates for the Great Salt Lake regional corridor and Conceptual Alignment E are within 2% of the most detailed estimate prepared for the Alternative E build alignment. This accuracy shows that the appropriate material cost contingencies were applied at different stages of project development.

The same level of accuracy was not obtained between the D&RG regional corridor to the conceptual D&RG alignments (see Table 3-2, Cost Estimates Comparison (in millions)). However, the cost estimates prepared for the conceptual DRG alignments have enough detail that, if these alternatives were carried forward to the next level of evaluation (and estimates were prepared using information from preliminary engineering design), approximately the same accuracy reported between the conceptual Alignment E and Build Alternative E (within 2%) could be expected.

¹ This contingency was developed and based on the FHWA review of the cost estimates. The 22% contingency applies to the D&RG alignment cost estimates where the D&RG alignments differ from the Alternative E alignment.