6.0 Implementation Plan and Cost Estimates

6.1 Implementation

Table 5-1 above, EWCTS Recommended Improvement Projects, lists a rank for each of the proposed improvement projects along the study corridors but does not identify a logical implementation sequence. The order in which projects are constructed largely depends on funding and priority (need), but the relationship of a proposed project to other recent or imminent projects in the vicinity also affects the sequence in which the projects can or should be constructed.

Funding has always been a challenge for UDOT. It is not likely that all of the projects listed in Table 5-1 above will be funded between now and 2035. Some projects might become obsolete as other improvements are constructed, and some could be combined into a single effort if they are close geographically. In such cases, it makes more sense to direct the limited funding that is available to other efforts.

Table 6-1 below suggests an implementation strategy that focuses primarily on the geographic distribution of projects. The strategy also considers project rankings and other “what-if” considerations along the three highways. Construction of higher-ranked projects (such as passing lanes, turn lanes, and shoulder improvements) could result in large areas of disturbance, including areas that are the subject of lower-ranked projects. In many cases, it would make sense to include the lower-ranked projects as part of overall construction of higher-ranked projects.

Table 6-1. EWCTS Project Implementation Strategy

Milepost Limits	Coordinating Projects	Description of Activity
SR-9 – Hurricane to Springdale		
General Notes: Of the three study corridors, this segment of SR-9 has the highest number of projects. As described in the following table items, most projects on the project list could be constructed in coordination with other projects. Some projects, including adding a pedestrian walkway to the Virgin River Bridge (Project 9-A at MP 11), improvements to the Kolob Reservoir Road intersection (Projects 9-O and 9-P at MP 18.7), and rehabilitation of the North Creek Bridge (Project 9-S at MP 19.3), aren't included in the implementation strategy described below. Construction of these projects, especially Project 9-O, should be considered as stand-alone projects as UDOT continues to program funding over the next 20 years. The two-way left-turn lane between MP 17.3 and MP 18.0 would likely be constructed as a stand-alone project or in coordination with future through-town improvements, such as traffic-calming, through the town of Virgin. Because some Virgin residents have stated that they do not want a two-way left-turn lane through town, this project should not be constructed until a corridor agreement, as listed in Table 5-2 above, EWCTS Recommended Coordination Agreements and Programs, is reached with Virgin. Rockville has also stated that it does not want to have a two-way left-turn lane constructed through town. UDOT should consider further coordination with Rockville before it plans and/or programs a two-way left-turn through the town. Guardrail and barrier attenuator projects are not included in the list below. Rather than complete these projects on a segment basis, UDOT would probably instead make the improvements through a barrier program that applies to the entire corridor. In some cases, barriers could be improved as part of other projects (such as the guardrail extension needed at MP 21.8 and MP 23.5, which could be installed as part of the passing-lanes project between MP 20.6 and MP 23.5), but the strategy below assumes that guardrail and barrier projects would be constructed on a stand-alone basis. Finally, curve improvements needed at MP 18, MP 19, and MP 20 (Project 9-L and Project 9-E) might need to be constructed as stand-alone projects. The following list describes a potential implementation strategy for projects that can be coordinated along four segments of SR-9.		
12 to 15 (La Verkin through the "Twist")	• 9-B (rumble strips) • 9-C (two-way left-turn lanes) • 9-D (additional traffic lane) • 9-E (improve curve delineation) • 9-F and 9-G (curve and clear-zone improvements) • 9-H (shoulder widening) • 9-I (turn lane) • 9-M (passing lane)	This section is primarily in need of improvements due to topographic conditions. Improvements would probably be phased with the most critical needs constructed first (such as Project 9-D from MP 12.5 to MP 13.0, which overlaps with the two-way left-turn lane listed under Project 9-C, MP 12.4 to MP 13.0). Shoulder widening (Project 9-H, MP 12.7 to MP 13.1 and MP 13.9 to MP 14.4) and curve improvements (Project 9-E, MP 13.2, MP 13.9, MP 14.8, and MP 15.0; and Projects 9-F and 9-G, MP 13.5 to MP 13.7) could be constructed simultaneously. The turn lane at the La Verkin overlook (Project 9-I, MP 14.9) could be constructed along with the passing-lane project that would start at about MP 15 (Project 9-M). Rumble strips (Project 9-B) could be added at any time, although it is logical to assume that some of the rumble strips would be added as part of curve improvements (Project 9-E) and shoulder widening (Project 9-H).

Table 6-1. EWCTS Project Implementation Strategy

Milepost Limits	Coordinating Projects	Description of Activity
15 to 18 (Top of "Twist" to Virgin)	• 9-B (rumble strips) • 9-H (shoulder widening) • 9-I (turn lane) • 9-J (culvert extension) • 9-M (passing lanes)	This section is mostly open highway and gives eastbound travelers the first opportunity to pass slower traffic after coming through the "Twist" and the last opportunity for westbound travelers to pass before going into the "Twist." Because of their locations, the needed passing lanes (Project 9-M, MP 15.0 to MP 15.6 and MP 15.8 to MP 16.1) and the turn lane at MP 16.1 (Project 9-I), which are the highest-priority projects, could be constructed at the same time. The culvert extension identified for MP 16.4 (Project 9-J) could be constructed at the same time the shoulder improvements between MP 16.5 and 16.9 (Project 9-H) are constructed. Rumble strips (Project 9-B) from MP 16.8 and to the west could be installed either as a stand-alone project or as part of shoulder widening (Project 9-H).
18 to 27 (Virgin to Rockville)	• 9-B (rumble strips) • 9-I (turn lane) • 9-M (passing lanes)	The passing-lane project from MP 20.6 to MP 23.5 (Project 9-M) could include rumble strips (Project 9-B, which applies to a long stretch of highway that includes the passing-lane project area) and the turn lane at MP 21 (Project 9-I). The passing-lane project from MP 26.3 to MP 26.7 could also include rumble strips, or rumble strips could be installed at any time. The turn lane at MP 25.8 (Project 9-I) might need to be considered a stand-alone project since there are no other improvements proposed for that general area.
27 to 33.5 (Rockville to Zion Park Entrance)	• 9-C (two-way left-turn lane) • 9-H (shoulder widening) • 9-I (turn lane) • 9-J (culvert extension) • 9-Q (raised markers) • 9-R (barrier removal) • 9-S (bridge rehab/replacement)	This section of SR-9 differs from the rest of the corridor in that it is the gateway to the Zion National Park entrance. Traffic is generally slower, and the highway can become congested during busy weekends and holidays and during summer. The topography limits construction of passing lanes, so improvements focus on making the existing system work better. Shoulder widening (Project 9-H, MP 28.7 to MP 29.2) and a two-way left-turn lane through Springdale (Project 9-C, MP 30 to MP 33) are the highest priority. The culvert extension needed at MP 30.4 (Project 9-J) and the rock wall removal at MP 30 (Project 9-R) could be completed as part of either the shoulder or turn-lane projects. The Springdale Wash bridge (Project 9-S, MP 31.5) is not in immediate need of rehabilitation, but construction of the two-way left-turn lane through Springdale (Project 9-C, MP 30 to MP 33) might require bridge widening as well. Raised markers (Project 9-Q, MP 27 to MP 30.3) are an inexpensive way to help delineate curves and could be installed at any time. If funding for the other higher-priority projects is delayed, UDOT should consider installing these markers in the near future, even though they are not ranked very high on Table 5-1 above, EWCTS Recommended Improvement Projects.

Table 6-1. EWCTS Project Implementation Strategy

Milepost Limits	Coordinating Projects	Description of Activity
SR-17 – La Verkin to I-15		
General Notes: The implementation strategy assumes that the current route of SR-17 will remain in place. If UDOT and Toquerville agree that a bypass will be constructed to a standard that would allow it to become the new route for SR-17 and that the official SR-17 will be transitioned, then the proposed improvement projects for the existing SR-17 might not be constructed or might be scaled back. As part of any Toquerville bypass transition proposal, UDOT should compare the relative cost of making improvements to the existing SR-17 to those of constructing a new highway as well as the potential social and environmental benefits and impacts such a change could have on the area. If allocating funds on the existing SR-17 depends on a decision about the Toquerville bypass, UDOT should move forward with coordination with Toquerville as outlined in the coordination and program projects list (see Table 5-2 above, EWCTS Recommended Coordination Agreements and Programs) before programming funds for extensive improvements to the existing section of SR-17 that would be subject to the reroute. Project 17-L, widening the highway to four lanes, is not included in the implementation strategy because of the uncertainty of the Toquerville bypass.		
0.3 to 2.8 (North La Verkin to South Toquerville)	• 17-B (rumble strips) • 14-C (clear zone widening) • 17-D (two-way left-turn lane) • 17-E (bridge rail transition repair) • 17-F (shoulder widening) • 17-G (improve curve) • 17-H, 17-I (barrier and guardrail improvements) • 17-K (improve curve)	This is the section that transitions from La Verkin to Toquerville. The improvements could be constructed at one time or could be phased. If phased, Projects 17-C and 17-F both address shoulders/clear-zone issues along a stretch from about MP 0.3 to MP 2.2. Rumble strips (Project 17-B) could be installed at the same time. Guardrail and barrier improvements in this section (17-H and 17-I) could be constructed as a stand-alone project or could be worked into the shoulder and clear-zone improvements (17-C, 17-F) Curve and turn-lane improvements between about MP 0.6 and MP 1.2 could be constructed simultaneously. The needed improvement at the La Verkin Creek Bridge could also be completed with the turn lanes and curve improvements since it is within the same section (and there is overlap with the two-way left-turn lane).
3.5 to 5.8 (North Toquerville to I-15)	• 17-B (rumble strips) • 17-F (shoulder widening) • 17-J (passing lanes)	This is the section from the northern end of downtown Toquerville to I-15 and would probably still serve as SR-17 even if the bypass is constructed (the bypass would connect into this section of SR-17). As traffic transitions from low speeds to high speeds (and vice versa), passing lanes and improved shoulders will become increasingly important for safety and traffic flow. This 2.5-mile section of road could be improved in stages, with shoulder and rumble strips together as one project and with the passing lanes as a separate project. Additional traffic lanes might be needed beyond 2035; this should be considered as UDOT plans shoulder improvements.

Table 6-1. EWCTS Project Implementation Strategy

Milepost Limits	Coordinating Projects	Description of Activity
SR-59 – Hildale to Hurricane		
General Notes: SR-59 currently serves mostly as a regional highway with minor amounts of local access for the Apple Valley and Hildale areas. Apple Valley has ambitious plans for the growth that it expects over the next 10 years. This growth will change the nature of SR-59. SR-59 will still provide an important regional highway for southern Utah and northern Arizona but will also become an important local access road for Apple Valley. For this reason, turn-lane projects will be important to local residents and passing lanes will become important for through traffic. Most of the projects included in Table 5-1 above, EWCTS Recommended Improvement Projects can be combined based on location. The following items describe a potential implementation strategy for SR-59 by milepost.		
1.0 to 5.4	• 59-B (rumble strips) • 59-E (passing lanes) • 59-D (two-way left-turn lane)	This section is rural and undeveloped and allows northbound traffic to increase speed after coming out of Hildale. Widen/restripe to accommodate passing and turn lanes. Add rumble strips for the entire length as part of the project.
5.4 to 8.0	• 59-B (rumble strips)	This section has limited access points and will probably stay undeveloped for some time. The rumble strips could be installed at any time (either as a stand-alone project or in coordination with other projects to the north).
8.0 to 18.0 (Apple Valley)	• 59-B (rumble strips) • 59-C (shoulder widening) • 59-D (extend existing two-way left-turn lanes) • 59-E (passing lanes) • 59-F (turn lanes for storage) • 59-G (clear zone widening) • 59-H (edge drop)	This section includes the core of Apple Valley and the approaches to the town on either end; several projects could be coordinated in this section. The section could be broken into two segments: from about MP 8.0 to MP 15.0 (Apple Valley section) and from MP 15.0 to MP 18.0 (Apple Valley to top of Hurricane Cliffs). Additional traffic lanes might be needed beyond 2035; this should be considered as UDOT plans shoulder improvements through this section.
18.0 to 22.0 (Hurricane Cliffs area)	• 59-A (SR-59/SR-9 intersection) • 59-B (rumble strips) • 59-C (shoulder widening) • 59-E (passing lane) • 59-F (turn lanes for storage) • 59-G (clear zone widening) • 59-I (new barrier) • 59-J (guardrail improvement)	This section covers the current SR-59/SR-9 intersection and the surrounding area. Depending on what is ultimately done with the intersection (Project 59-A, either a reroute/reconfiguration or reconstruction of the existing configuration), some or all of these projects could be constructed as part of that project. If the highway is rerouted, some of the projects might still be needed if the existing road remains in place for local access. A northbound passing lane would probably be constructed in either case, since it would still be needed even if the intersection is rerouted/reconfigured. Project 59-A should be studied and fully planned before any of the other projects are constructed in this section.

6.2 Cost Estimates

Table 6-2 provides planning-level cost estimates for 10 projects from the recommended improvement projects list (see Table 5-1 above, EWCTS Recommended Improvement Projects). UDOT selected these projects based on priority and anticipated schedule. Table 6-2 also includes estimates for three Toquerville bypass scenarios. The Toquerville bypass scenarios are based on the lowest cost, highest cost, and "preferred" alternatives identified in the Toquerville Master Plan (Riley Transportation Consultants and Sunrise Engineering 2008). Detailed information for each cost estimate follows the table.

Table 6-2. Planning-Level Cost Estimates for the Eastern Washington County Transportation Study

Project and Overall Rank	Project Description	Planning-Level Cost Estimate
Project 9-C Rank 5 (tie)	Install two-way left-turn lane between the following points: • MP 12.4 to MP 13.0 • MP 17.3 to MP 18.0 • MP 27.47 (through Rockville) • MP 30.0 to MP 33.0 (through Springdale)	$8,840,000
Project 9-D Rank 7 (tie)	Add a second traffic lane to improve intersection of SR-9 and SR-17 from MP 13.0 to MP 12.5.	$770,000
Project 9-I Rank 7 (tie)	Add left turn lanes as follows: • Onto La Verkin overlook, MP 14.9, westbound • To the south for "T" intersection, MP 16.1, westbound • MP 21, westbound • MP 25.8, westbound	$1,300,000
Project 9-O Rank 3	Improve intersection of SR-9 and Kolob Reservoir Road at MP 18.7.	$650,000
Project 17-D Rank 5 (tie)	Add two-way left-turn lanes (permissive) between the following points: • MP 0.6 to MP 0.9 (begin flare at north end of La Verkin Creek Bridge) • MP 1.5 to MP 2.0 • MP 2.8 to MP 3.4 (through Toquerville)	$1,380,000
Project 17-G Rank 8	Improve curve safety by adding left-turn storage at MP 1.2 in the southbound direction.	$170,000
Project 17-J Rank 10	Construct passing lanes between MP 4.3 and MP 4.9 in both directions.	$1,730,000
Project 59-A Rank 1	Improve the existing SR-59 approach to Hurricane by adding a second travel lane in each direction.	$2,340,000

Table 6-2. Planning-Level Cost Estimates for the Eastern Washington County Transportation Study

Project and Overall Rank	Project Description	Planning-Level Cost Estimate
Project 59-D Rank 4	Construct two-way left-turn lanes in the following locations: • Extend existing MP 0.64 to MP 0.27, southbound • MP 4.5 to MP 5.4 • Extend existing MP 9.8 to MP 10.1 • Extend existing MP 10.5 to MP 10.7	$2,950,000
Project 59-F Rank 2	Construct right- and left-turn lanes (for storage) at the following locations: • Left-turn storage, MP 8.1 (Apple Valley Main Street), both directions • Right-turn storage, MP 11.9, both directions • Left-turn storage, MP 14.6 (Kokopelli Golf Course), northbound • Left-turn storage, MP 21.2, southbound • Add left-turn lanes to improve intersection, MP 22.02 (100 South and 100 East in Hurricane), both directions • Add left-turn lanes to improve intersection, MP 22.05 (Main Street and 100 South in Hurricane), both directions	$1,840,000
Bypass Preferred	The Water Conservancy Road alignment. Ties into I-15 frontage road. South of Anderson Junction heads east and ties into SR-17 near Old Church Road.	$34,910,000
Bypass 1A[b]	One option of the Grassy Lane alignment. Splits from existing SR-17 1 mile south of I-15 and ties into existing SR-17 at Grassy Lane.	$23,410,000
Bypass 3A[b]	One option of the La Verkin alignment. Splits from existing SR-17 1 mile south of I-15 and ties into the Southern Corridor in La Verkin. This alignment does not tie into the existing SR-17 corridor south of Toquerville.	$50,180,000

[a] The cost estimate is for one option that would improve the existing alignment of SR-59 as it enters Hurricane. The study described in Project 59-A would fully address other options, such as new connections or other improvements to the existing intersection of SR-59 and SR-9.

[b] Because the Toquerville bypass options were not included in Table 5-1 above, EWCTS Recommended Improvement Projects, they do not have an overall rank.

Table 6-3. Project 9-C: Install Two-Way Left-Turn Lanes on SR-9

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 9-C				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	1330	*$18,000.00*
Granular Borrow	Ton	$28.00	30062	*$842,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	33487	*$503,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	14310	*$158,000.00*
Remove Concrete Sidewalk	sq yd	$9.00	8824	*$80,000.00*
Untreated Base Course	Ton	$20.00	20795	*$416,000.00*
HMA - 3/4 inch	Ton	$125.00	11454	*$1,432,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	14310	*$330,000.00*
Concrete Sidewalk	sq ft	$5.00	79416	*$398,000.00*
			SUBTOTAL	$4,177,000
Mobilization	15%			*$630,000.00*
Traffic Control	7%			*$293,000.00*
Surveying (Construction)	3%			*$126,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$1,570,000.00*
			SUBTOTAL	$6,796,000
Preliminary/Final Engineering	10%		1	*$680,000.00*
			SUBTOTAL	$7,476,000
Construction Engineering	10%			*$ 680,000.00*
UDOT Contingency	10%			*$ 680,000.00*
			TOTAL	**$8,836,000**
			ROUNDED TOTAL	***$8,840,000***

Italics denote rounding

Table 6-4. Project 9-D: Add Second Traffic Lane To Improve Intersection of SR-9 and SR-17

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 9-D				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	880	*$12,000.00*
Granular Borrow	Ton	$28.00	3160	*$89,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	3520	*$53,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	2186	*$44,000.00*
HMA - 3/4 inch	Ton	$125.00	1204	*$151,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$349,000
Mobilization	15%			*$60,000.00*
Traffic Control	7%			*$25,000.00*
Surveying (Construction)	3%			*$11,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$140,000.00*
			SUBTOTAL	$585,000
Preliminary/Final Engineering	10%		1	*$59,000.00*
			SUBTOTAL	$644,000
Construction Engineering	10%			*$ 59,000.00*
UDOT Contingency	10%			*$ 59,000.00*
			TOTAL	**$762,000**
			ROUNDED TOTAL	***$770,000***

Italics denote rounding

Table 6-5. Project 9-I: Add Left-Turn Lanes on SR-9

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 9-I				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	1520	*$20,000.00*
Granular Borrow	Ton	$28.00	5460	*$153,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	6080	*$92,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	3776	*$76,000.00*
HMA - 3/4 inch	Ton	$125.00	2080	*$260,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$601,000
Mobilization	15%			*$100,000.00*
Traffic Control	7%			*$43,000.00*
Surveying (Construction)	3%			*$19,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$230,000.00*
			SUBTOTAL	$993,000
Preliminary/Final Engineering	10%		1	*$100,000.00*
			SUBTOTAL	$1,093,000
Construction Engineering	10%			*$ 100,000.00*
UDOT Contingency	10%			*$ 100,000.00*
			TOTAL	**$1,293,000**
			ROUNDED TOTAL	***$1,300,000***

Italics denote rounding

Table 6-6. Project 9-O: Improve Intersection of SR-9 and Kolob Reservoir Road

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 9-O				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	*$0.00*
Granular Borrow	Ton	$28.00	2730	*$77,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	3040	*$46,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	1888	*$38,000.00*
HMA - 3/4 inch	Ton	$125.00	1040	*$130,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$291,000
Mobilization	15%			*$50,000.00*
Traffic Control	7%			*$21,000.00*
Surveying (Construction)	3%			*$9,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$120,000.00*
			SUBTOTAL	$491,000
Preliminary/Final Engineering	10%		1	*$50,000.00*
			SUBTOTAL	$541,000
Construction Engineering	10%			*$ 50,000.00*
UDOT Contingency	10%			*$ 50,000.00*
			TOTAL	**$641,000**
			ROUNDED TOTAL	***$650,000***

Italics denote rounding

Table 6-7. Project 17-D: Add Two-Way Left-Turn Lanes on SR-17

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 17-D				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	1027	*$14,000.00*
Granular Borrow	Ton	$28.00	5899	*$166,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	6571	*$99,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	4080	*$82,000.00*
HMA - 3/4 inch	Ton	$125.00	2248	*$281,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$642,000
Mobilization	15%			*$100,000.00*
Traffic Control	7%			*$45,000.00*
Surveying (Construction)	3%			*$20,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$250,000.00*
			SUBTOTAL	$1,057,000
Preliminary/Final Engineering	10%		1	*$106,000.00*
			SUBTOTAL	$1,163,000
Construction Engineering	10%			*$ 106,000.00*
UDOT Contingency	10%			*$ 106,000.00*
			TOTAL	**$1,375,000**
			ROUNDED TOTAL	***$1,380,000***

Italics denote rounding

Table 6-8. Project 17-G: Improve Curve Safety at MP 1.2 on SR-17

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 17-G				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	*$0.00*
Granular Borrow	Ton	$28.00	634	*$18,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	707	*$11,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	439	*$9,000.00*
HMA - 3/4 inch	Ton	$125.00	242	*$31,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$69,000
Mobilization	15%			*$20,000.00*
Traffic Control	7%			*$5,000.00*
Surveying (Construction)	3%			*$3,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$30,000.00*
			SUBTOTAL	$127,000
Preliminary/Final Engineering	10%		1	*$13,000.00*
			SUBTOTAL	$140,000
Construction Engineering	10%			*$ 13,000.00*
UDOT Contingency	10%			*$ 13,000.00*
			TOTAL	**$166,000**
			ROUNDED TOTAL	***$170,000***

Italics denote rounding

Table 6-9. Project 17-J: Construct Passing Lanes on SR-17

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 17- J				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	*$0.00*
Granular Borrow	Ton	$28.00	7584	*$213,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	8448	*$127,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	5246	*$105,000.00*
HMA - 3/4 inch	Ton	$125.00	2889	*$362,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$807,000
Mobilization	15%			*$130,000.00*
Traffic Control	7%			*$57,000.00*
Surveying (Construction)	3%			*$25,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$310,000.00*
			SUBTOTAL	$1,329,000
Preliminary/Final Engineering	10%		1	*$133,000.00*
			SUBTOTAL	$1,462,000
Construction Engineering	10%			*$ 133,000.00*
UDOT Contingency	10%			*$ 133,000.00*
			TOTAL	**$1,728,000**
			ROUNDED TOTAL	***$1,730,000***

Italics denote rounding

Table 6-10. Project 59-A: Improve Intersection of SR-59 and SR-9 in Hurricane

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 59-A				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	7744	*$101,000.00*
Granular Borrow	Ton	$28.00	6952	*$195,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	7744	*$117,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	3600	*$40,000.00*
Remove Concrete Sidewalk	sq yd	$9.00	2000	*$18,000.00*
Remove Guardrail	ft	$3.00	950	*$3,000.00*
Untreated Base Course	Ton	$20.00	4809	*$97,000.00*
HMA - 3/4 inch	Ton	$125.00	2648	*$331,000.00*
W-Beam Guardrail 72 inch Wood Post	ft	$20.00	950	*$19,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	3600	*$83,000.00*
Concrete Sidewalk	sq ft	$5.00	18000	*$90,000.00*
			SUBTOTAL	$1,094,000
Mobilization	15%			*$170,000.00*
Traffic Control	7%			*$77,000.00*
Surveying (Construction)	3%			*$33,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$420,000.00*
			SUBTOTAL	$1,794,000
Preliminary/Final Engineering	10%		1	*$180,000.00*
			SUBTOTAL	$1,974,000
Construction Engineering	10%			*$ 180,000.00*
UDOT Contingency	10%			*$ 180,000.00*
			TOTAL	**$2,334,000**
			ROUNDED TOTAL	***$2,340,000***

Italics denote rounding

Table 6-11. Project 59-D: Construct Two-Way Left Turn Lanes on SR-59

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 59-D				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	*$0.00*
Granular Borrow	Ton	$28.00	13052	*$366,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	14539	*$219,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	9028	*$181,000.00*
HMA - 3/4 inch	Ton	$125.00	4973	*$622,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$1,388,000
Mobilization	15%			*$210,000.00*
Traffic Control	7%			*$98,000.00*
Surveying (Construction)	3%			*$42,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$530,000.00*
			SUBTOTAL	$2,268,000
Preliminary/Final Engineering	10%		1	*$227,000.00*
			SUBTOTAL	$2,495,000
Construction Engineering	10%			*$ 227,000.00*
UDOT Contingency	10%			*$ 227,000.00*
			TOTAL	**$2,949,000**
			ROUNDED TOTAL	***$2,950,000***

Italics denote rounding

Table 6-12. Project 59-F: Construct Right- and Left-Turn Lanes on SR-59

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project 59-F				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	*$0.00*
Granular Borrow	Ton	$28.00	8090	*$227,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	9009	*$136,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	5594	*$112,000.00*
HMA - 3/4 inch	Ton	$125.00	3082	*$386,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$861,000
Mobilization	15%			*$130,000.00*
Traffic Control	7%			*$61,000.00*
Surveying (Construction)	3%			*$26,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$330,000.00*
			SUBTOTAL	$1,408,000
Preliminary/Final Engineering	10%		1	*$141,000.00*
			SUBTOTAL	$1,549,000
Construction Engineering	10%			*$ 141,000.00*
UDOT Contingency	10%			*$ 141,000.00*
			TOTAL	**$1,831,000**
			ROUNDED TOTAL	***$1,840,000***

Italics denote rounding

Table 6-13. Toquerville Bypass Preferred Alignment

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Toquerville Bypass Preferred Alignment				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	$0.00
Granular Borrow	Ton	$20.00	146,900	$2,938,000.00
Roadway Excavation (Plan Quantity)	yd3	$10.00	0	$0.00
Remove Concrete Curb and Gutter	ft	$6.00	0	$0.00
Remove Concrete Sidewalk	sq yd	$9.00	0	$0.00
Untreated Base Course	Ton	$30.00	61,400	$1,842,000.00
HMA - 3/4 inch	Ton	$150.00	65,600	$9,840,000.00
Concrete Curb and Gutter Type B1	ft	$23.00	35,800	$823,400.00
Concrete Sidewalk	sq ft	$5.00	214,800	$1,074,000.00
			SUBTOTAL	$16,517,400
Mobilization	15%			$2,480,000.00
Traffic Control	7%			$1,157,000.00
Surveying (Construction)	3%			$496,000.00
Right of Way ($50/ft^2 Assumption)	sq ft	$20.00	0	$0.00
Contingency (Items not accounted for)	30%			$6,200,000.00
			SUBTOTAL	$26,850,400
Preliminary/Final Engineering	10%		1	$2,686,000.00
			SUBTOTAL	$29,536,400
Construction Engineering	10%			$ 2,686,000.00
UDOT Contingency	10%			$ 2,686,000.00
			TOTAL	**$34,910,000**

Table 6-14. Toquerville Bypass Option 1A: Grassy Lane Alignment

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project Toquerville Bypass Alt 1A				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	*$0.00*
Granular Borrow	Ton	$28.00	104229	*$2,919,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	116100	*$1,742,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	72098	*$1,442,000.00*
HMA - 3/4 inch	Ton	$125.00	39706	*$4,964,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$11,067,000
Mobilization	15%			*$1,670,000.00*
Traffic Control	7%			*$775,000.00*
Surveying (Construction)	3%			*$333,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$4,160,000.00*
			SUBTOTAL	$18,005,000
Preliminary/Final Engineering	10%		1	*$1,801,000.00*
			SUBTOTAL	$19,806,000
Construction Engineering	10%			*$ 1,801,000.00*
UDOT Contingency	10%			*$ 1,801,000.00*
			TOTAL	**$23,408,000**
			ROUNDED TOTAL	***$23,410,000***

Italics denote rounding

Table 6-15. Toquerville Bypass Option 3A: La Verkin Alignment

Utah Department of Transportation Eastern Washington County Transportation Study				
Cost Estimate - Project Toquerville Bypass Alt 3A				
Items	**UNIT**	**UNIT COST**	**QUANTITY**	**AMOUNT**
Borrow (Plan Quantity)	sq yd	$13.00	0	*$0.00*
Granular Borrow	Ton	$28.00	223591	*$6,261,000.00*
Roadway Excavation (Plan Quantity)	yd3	$15.00	249057	*$3,736,000.00*
Remove Concrete Curb and Gutter	ft	$11.00	0	*$0.00*
Remove Concrete Sidewalk	sq yd	$9.00	0	*$0.00*
Untreated Base Course	Ton	$20.00	154664	*$3,094,000.00*
HMA - 3/4 inch	Ton	$125.00	85178	*$10,648,000.00*
Concrete Curb and Gutter Type B1	ft	$23.00	0	*$0.00*
Concrete Sidewalk	sq ft	$5.00	0	*$0.00*
			SUBTOTAL	$23,739,000
Mobilization	15%			*$3,570,000.00*
Traffic Control	7%			*$1,662,000.00*
Surveying (Construction)	3%			*$713,000.00*
Right of Way ($50/ft^2 Assumption)	sq ft	$50.00	0	*$0.00*
Contingency (Items not accounted for)	30%			*$8,910,000.00*
			SUBTOTAL	$38,594,000
Preliminary/Final Engineering	10%		1	*$3,860,000.00*
			SUBTOTAL	$42,454,000
Construction Engineering	10%			*$ 3,860,000.00*
UDOT Contingency	10%			*$ 3,860,000.00*
			TOTAL	**$50,174,000**
			ROUNDED TOTAL	***$50,180,000***

Italics denote rounding

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