8 PROJECT IMPLEMENTATION

8.1 Opinions of Construction Costs

The construction cost estimate for Grant Road Improvement Plan, based on quantities from the 30 percent construction plans is $102,120,380 in 2008 dollars. The construction cost estimate used ADOT 2008 Estimated Construction Costs and the following unit price assumptions for design elements that did not lend themselves to quantity estimates at the 30 percent design stage:

- Fiber Optic Line: $180,000 per mile
- Street Lighting: $478,250 per mile
- Signing: $15,000 per Construction Segment
- Utility Line Adjustments: $922,400 per mile

A detailed summary of project quantities and costs are provided in **Table 16.** The total construction cost also reflects the costs associated with incremental construction during the RTA construction period which spans 2012 to 2026. Right-of-way acquisition cost estimates were not developed by the Grant Road Design Team.

Table 16. Grant Road Preliminary Overall Construction Cost Estimate

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
2020014	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	L.SUM	1	$1,829,000.00	$1,829,000.00
2020020	REMOVAL OF CONCRETE CURB	L.FT.	84,706	$2.00	$169,412.00
2020021	REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	9,470	$2.00	$18,940.00
2020025	REMOVAL OF CONCRETE SIDEWALKS, DRIVEWAYS AND SLABS	SQ.FT.	272,667	$2.00	$545,334.00
2020029	REMOVAL OF ASPHALTIC CONCRETE PAVEMENT	SQ.YD.	513,549	$5.00	$2,567,745.00
2020034	REMOVAL OF SIGNS	L.SUM	1	$62,500.00	$62,500.00
2020041	REMOVAL OF PIPE	L.FT.	2,929	$50.00	$146,450.00
2020052	REMOVE (SLOTTED DRAIN)	L.FT.	243	$65.00	$15,795.00
2030401	DRAINAGE EXCAVATION	CU.YD.	15,960	$3.00	$47,881.27
2050001	GRADING ROADWAY FOR PAVEMENT	SQ.YD.	466,703	$4.00	$1,866,812.00
3030023	AGGREGATE BASE, CLASS 3	CU.YD.	94,293	$40.00	$3,771,720.00
4010011	PORTLAND CEMENT CONCRETE PAVEMENT (11")	SQ.YD.	32,338	$40.00	$1,293,520.00
4040111	BITUMINOUS TACK COAT	TON	197	$300.00	$59,100.00
4060017	ASPHALTIC CONCRETE (SURFACE COURSE, 2" THICK)	TON	43,819	$60.00	$2,629,140.00
4060018	ASPHALTIC CONCRETE (BASE COURSE, 4"THICK)	TON	87,634	$60.00	$5,258,040.00
6110203	PROTECTIVE RAILING	L.FT.	1,492	$100.00	$149,200.00
7010120	POST BARRICADE	EACH	42	$1,450.00	$60,900.00
7060080	PAVEMENT MARKER, REFLECTIVE, RAISED CERAMIC DOME (8" DIA)	EACH	339	$50.00	$16,950.00
9080041	CONCRETE CURB (PC/COT STD. DTL. 209)(TYPE 2)	L.FT.	145,933	$9.00	$1,313,397.00
9080043	CONCRETE WEDGE CURB	L.FT.	1,170	$10.00	$11,700.00
9080242	CONCRETE SIDEWALK (PC/COT STD. DTL. 200)(4', 6', & 8' WIDTH)	SQ.FT.	476,400	$3.50	$1,667,400.00
9080293	CONCRETE SIDEWALK RAMP (ADOT STD. DTL. C-05.30, 3 OF 7 MODIFIED)	EACH	9	$800.00	$7,200.00
9080296	CONCRETE SIDEWALK RAMP (PC/COT STD. DTL. 207, 1 OF 5)	EACH	138	$1,200.00	$165,600.00
9080297	CONCRETE SIDEWALK RAMP (ADOT STD. DTL. C-05.30, 5 OF 7)	EACH	1	$1,000.00	$1,000.00
9080298	CONCRETE SIDEWALK RAMP (PC/COT STD. DTL. 207, 4A OF 5)	EACH	272	$1,000.00	$272,000.00

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
9080299	CONCRETE SIDEWALK RAMP (PC/COT STD. DTL. 207, 5 OF 5)	EACH	1	$1,200.00	$1,200.00
9080300	CONCRETE SIDEWALK RAMP (PC/COT STD. DTL. 207, 4A OF 5 MODIFIED)	EACH	21	$2,000.00	$42,000.00
9080302	CONCRETE SIDEWALK RAMP (ADOT STD. DTL. C-05.30, 2 OF 7 MODIFIED)	EACH	18	$2,000.00	$36,000.00
9080305	CONCRETE DRIVEWAY (COT STD. DTL. 206)	SQ.FT.	17,100	$6.00	$102,600.00
9080306	CONCRETE DRIVEWAY (COT STD. DTL. 206 MODIFIED)	SQ.FT.	64,910	$10.00	$649,100.00
9080602	CONCRETE BUS SHELTER PAD (SINGLE-4'8" x 22')	SQ.FT.	2,259	$4.00	$9,034.60
9080603	CONCRETE BUS SHELTER PAD (DOUBLE-4'8" x 34')	SQ.FT.	2,697	$4.00	$10,789.29
9140031	TRASH RECEPTACLE (ABOVE GROUND)	EACH	58	$1,500.00	$87,000.00
9140084	SHADE STRUCTURE	EACH	23	$10,000.00	$230,000.00
9140085	TENSILE SHADE STRUCTURE	EACH	11	$35,000.00	$385,000.00
9140101	SCORING/SANDBLAST TREATMENT	SQ.FT.	77,013	$2.00	$154,026.00
9140401	TREE GRATE (STREETSCAPE)	EACH	167	$1,200.00	$200,400.00
9144012	BENCH	EACH	39	$2,750.00	$107,250.00
9159001	SEAT WALL	L.FT.	192	$80.00	$15,360.00
5010025	PIPE, CORRUGATED METAL, 36"	L.FT.	48	$80.00	$3,840.00
5010030	PIPE, CORRUGATED METAL, 42"	L.FT.	537	$220.00	$118,140.00
5011500	PIPE, REINFORCED CONCRETE (18")	L.FT.	51	$160.00	$8,160.00

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
5011501	PIPE, REINFORCED CONCRETE (24")	L.FT.	3,780	$185.00	$699,300.00
5011502	PIPE, REINFORCED CONCRETE (30")	L.FT.	571	$205.00	$117,055.00
5011503	PIPE, REINFORCED CONCRETE (36")	L.FT.	779	$245.00	$190,855.00
5011504	PIPE, REINFORCED CONCRETE (42")	L.FT.	619	$375.00	$232,125.00
5011505	PIPE, REINFORCED CONCRETE (48")	L.FT.	348	$420.00	$146,160.00
5011507	PIPE, REINFORCED CONCRETE (60")	L.FT.	83	$540.00	$44,820.00
5011510	PIPE, REINFORCED CONCRETE (38" ELLIPTICAL)	L.FT.	24	$300.00	$7,200.00
5011511	PIPE, REINFORCED CONCRETE (96")	L.FT.	161	$650.00	$104,650.00
5011512	PIPE, REINFORCED CONCRETE (21")	L.FT.	79	$170.00	$13,430.00
5011513	PIPE, REINFORCED CONCRETE (60" ELLIPTICAL)	L.FT.	164	$580.00	$95,120.00
5030182	DROP INLET (WITH GRATE)	L.FT.	606	$2,250.00	$1,363,500.00
5030183	DROP INLET (MATCH EXISTING, 6.0' WIDTH)	L.FT.	127	$3,800.00	$482,600.00
5030184	DROP INLET (MATCH EXISTING, 8.5' WIDTH)	L.FT.	91	$5,000.00	$455,000.00
5030211	TRENCH DRAIN (STREETSCAPE)	L.FT.	216	$60.00	$12,960.00
5030212	CONCRETE TRENCH DRAIN	L.FT.	100	$200.00	$20,000.00
5030604	CONCRETE CATCH BASIN (PC/COT STD. DTL. 308)(Wing=4')	EACH	19	$4,000.00	$76,000.00

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
5030605	CONCRETE CATCH BASIN (PC/COT STD. DTL. 308)(Wing=8')	EACH	10	$5,000.00	$50,000.00
5030606	CONCRETE CATCH BASIN (PC/COT STD. DTL. 308)(Wing=12')	EACH	6	$8,000.00	$48,000.00
5030607	CONCRETE CATCH BASIN (PC/COT STD. DTL. 308)(Wing=16')	EACH	31	$12,000.00	$372,000.00
5042000	MISCELLANEOUS SANITARY SEWER WORK	L.SUM	1	$120,000.00	$120,000.00
5041996	DRAINAGE STRUCTURE (HEADWALL)	EACH	1	$6,000.00	$6,000.00
5050075	MANHOLE (PC/COT STD. DTL. 302)	EACH	40	$4,000.00	$160,000.00
5090110	SEWER MANHOLE ADJUSTMENT	EACH	119	$2,000.00	$238,000.00
5101000	WATER LINE RELOCATION	L.SUM	1	$4,850,000.00	$4,850,000.00
5110001	MISCELLANEOUS UTILITY RELOCATIONS	F.A.	1	$103,000.00	$103,000.00
9080512	SCUPPER (PC/COT STD. DET 205.5, TYPE 3)	EACH	2	$6,000.00	$12,000.00
6080000	SIGNING	L.SUM	1	$100,000.00	$100,000.00
6080001	WAYFINDING SIGNS	EACH	45	$3,000.00	$135,000.00
6080004	BUSINESS/GATEWAY SIGN	EACH	64	$10,000.00	$640,000.00
7010001	MAINTENANCE AND PROTECTION OF TRAFFIC	L.SUM	1	$6,570,000.00	$6,570,000.00
7040003	PAVEMENT MARKING (WHITE SPRAYED THERMOPLASTIC)(0.060")	L.FT.	180,249	$0.20	$36,049.80
7040072	PAVEMENT MARKING (TRANSVERSE) (THERMOPLASTIC) (ALKYD) (0.090")	L.FT.	49,512	$0.40	$19,804.80

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
7050020	PAVEMENT MARKING, PREFORMED, TYPE I, LEGEND (BIKE)	EACH	24	$350.00	$8,400.00
7050023	PAVEMENT MARKING, PREFORMED, TYPE I, SINGLE ARROW	EACH	306	$130.00	$39,780.00
7050026	PAVEMENT MARKING, PREFORMED, TYPE I, LEGEND (ONLY)	EACH	79	$130.00	$10,270.00
7060015	PAVEMENT MARKER, RAISED, TYPE D	EACH	3,009	$3.50	$10,531.50
7060018	PAVEMENT MARKER, RAISED, TYPE G	EACH	940	$3.50	$3,290.00
7080001	PERMANENT PAVEMENT MARKING (PAINTED) (WHITE)	L.FT.	141,681	$0.05	$7,084.06
7080121	PERMANENT PAVEMENT MARKING (PAINTED SYMBOL) (ARROW)	EACH	306	$45.00	$13,770.00
7080211	PERMANENT PAVEMENT MARKING (PAINTED LEGEND) (BIKE)	EACH	24	$70.00	$1,680.00
7080221	PERMANENT PAVEMENT MARKING (PAINTED LEGEND) (ONLY)	EACH	79	$45.00	$3,555.00
7080302	CONCRETE SPEED TABLE (3" HEIGHT)	EACH	6	$7,000.00	$42,000.00
7080303	CONCRETE SPEED TABLE (6" HEIGHT)	EACH	4	$3,000.00	$12,000.00
7310010	POLE (TYPE A)	EACH	88	$1,500.00	$132,000.00
7310050	POLE (TYPE E)	EACH	50	$3,250.00	$162,500.00
7310130	POLE (TYPE Q)	EACH	27	$5,000.00	$135,000.00
7310140	POLE (TYPE R)	EACH	62	$140.00	$8,680.00
7310195	POST (PEDESTRIAN PUSH BUTTON)	EACH	31	$1,000.00	$31,000.00

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
7310200	POLE FOUNDATION (TYPE A)	EACH	88	$1,200.00	$105,600.00
7310240	POLE FOUNDATION (TYPE E)	EACH	50	$2,000.00	$100,000.00
7310310	POLE FOUNDATION (TYPE Q)	EACH	27	$3,000.00	$81,000.00
7310320	POLE FOUNDATION (TYPE R)	EACH	62	$3,000.00	$186,000.00
7310390	PEDESTRIAN PUSH BUTTON POST FOUNDATION	EACH	31	$1,000.00	$31,000.00
7310551	MAST ARM (20 FT.) (TAPERED)	EACH	139	$2,200.00	$305,800.00
7310570	MAST ARM (30 FT.) (TAPERED)	EACH	1	$2,500.00	$2,500.00
7310590	MAST ARM (40 FT.) (TAPERED)	EACH	26	$2,750.00	$71,500.00
7310600	MAST ARM (45 FT.) (TAPERED)	EACH	21	$2,900.00	$60,900.00
7310620	MAST ARM (55 FT.) (TAPERED)	EACH	25	$3,500.00	$87,500.00
7310650	MAST ARM (65 FT.) (TAPERED)	EACH	16	$4,000.00	$64,000.00
7310810	REMOVE AND SALVAGE EXISTING LIGHTING POLE	L.SUM	1	$200,000.00	$200,000.00
7320040	ELECTRICAL CONDUIT (1 1/2") (PVC)	L.FT.	2,700	$10.00	$27,000.00
7320050	ELECTRICAL CONDUIT (2") (PVC)	L.FT.	17,500	$11.00	$192,500.00
7320090	ELECTRICAL CONDUIT (4") (PVC)	L.FT.	20,150	$15.00	$302,250.00
7320420	PULL BOX (NO. 7)	EACH	149	$750.00	$111,750.00
7320421	PULL BOX (NO. 7) (WITH EXTENSION)	EACH	37	$1,000.00	$37,000.00
7320650	CONDUCTORS	EACH	37	$10,000.00	$370,000.00

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
7320770	FIBER OPTIC CABLE	L.SUM	1	$1,000,000.00	$1,000,000.00
7320831	BATTERY BACK UP CABINET (UPS) AND FOUNDATION	EACH	37	$525.00	$19,425.00
7330060	TRAFFIC SIGNAL FACE (TYPE F)	EACH	461	$900.00	$414,900.00
7330130	TRAFFIC SIGNAL FACE (TYPE Q)	EACH	44	$1,000.00	$44,000.00
7330135	TRAFFIC SIGNAL FACE (TYPE R)	EACH	28	$1,000.00	$28,000.00
7330210	TRAFFIC SIGNAL FACE (PEDESTRIAN) MAN/HAND)	EACH	202	$525.00	$106,050.00
7330220	PEDESTRIAN PUSH BUTTON	EACH	212	$280.00	$59,360.00
7330310	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE II)	EACH	272	$200.00	$54,400.00
7330330	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE IV)	EACH	64	$400.00	$25,600.00
7330340	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE V)	EACH	88	$400.00	$35,200.00
7330350	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE VI)	EACH	9	$400.00	$3,600.00
7330360	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE VII)	EACH	57	$400.00	$22,800.00
7330400	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE XI)	EACH	202	$400.00	$80,800.00
7330510	SIGN (STREET NAME)	EACH	74	$500.00	$37,000.00
7330630	REMOVE TRAFFIC SIGNALS	EACH	15	$10,000.00	$150,000.00

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
7340040	CONTROL CABINET (TYPE IV)	EACH	36	$24,000.00	$864,000.00
7340105	CONTROL CABINET FOUNDATION	EACH	36	$1,500.00	$54,000.00
7340110	SERVICE PEDESTAL CABINET	EACH	36	$5,000.00	$180,000.00
7340125	SERVICE PEDESTAL CABINET FOUNDATION	EACH	36	$1,500.00	$54,000.00
7350000	LOOP DETECTOR TRAFFIC COUNTER SYSTEM	EACH	66	$30,000.00	$1,980,000.00
7350810	PRE-EMPT SENSORS	EACH	93	$600.00	$55,800.00
7360050	LUMINAIRE (HORIZONTAL MOUNT) (HPS 400 WATT)	EACH	141	$500.00	$70,500.00
7360132	STREET LIGHTING	L.SUM	1	$2,630,300.00	$2,630,300.00
7360190	PHOTO ELECTRIC CONTROL (STREET LIGHT)	EACH	88	$200.00	$17,600.00
7360332	PEDESTRIAN SAFETY LIGHTING	EACH	764	$4,700.00	$3,590,800.00
7370200	TEMPORARY TRAFFIC SIGNALS	EACH	14	$120,000.00	$1,680,000.00
7370399	ELECTRICAL SERVICE	EACH	23	$5,000.00	$115,000.00
8000001	MAINTENANCE	MONTH	36	$1,200.00	$43,200.00
8020012	FINE GRADING	L.SUM	1	$54,300.00	$54,300.00
8030120	ROCK MULCH (3" - 6" SCREENED)	SQ.FT.	297,169	$2.50	$742,922.50
8030122	ROCK MULCH (1" SCREENED)	SQ.FT.	445,754	$0.60	$267,452.40
8051001	WEED ERADICATION (FORCE ACCOUNT WORK)	L.SUM	1	$30,250.00	$30,250.00
8060066	PRUNING & SHAPING TREES, SHRUBS & PLANTS	L.SUM	1	$42,400.00	$42,400.00

Table 16. Grant Road Preliminary Overall Construction Cost Estimate (continued)

ITEM No.	ITEM	UNIT	30 % Preliminary Estimate DATE: 07/27/10		
			QUANTITY	UNIT PRICE	AMOUNT
8061005	TREE (15 GALLON)	EACH	2,569	$165.00	$423,885.00
8061111	GROUND COVER (ONE GALLON)	EACH	590	$5.00	$2,950.00
8061298	SHRUB (FIVE GALLON)	EACH	641	$16.00	$10,256.00
8061300	ACCENT (5 GALLON)	EACH	4,018	$32.00	$128,576.00
8061604	CACTUS (SAGUARO) (6' TO 8' IN HEIGHT)	EACH	127	$700.00	$88,900.00
8070200	WATER HARVESTING	L.SUM	1	$132,600.00	$132,600.00
8070201	CHECK DAMS	EACH	290	$1,200.00	$348,000.00
8080002	IRRIGATION	L.SUM	1	$958,500.00	$958,500.00
				TOTAL CONSTRUCTION COST	***$63,232,433.21***
	Construction Survey & Layout @		1.5%		$948,486.50
	Mobilization @		8.0%		$5,058,594.66
	Erosion Control @		1.0%		$632,324.33
	Water/Dust @		1.0%		$632,324.33
	Contingency @		15.0%		$9,484,864.98
	Quality Control and Testing @		2.0%		$1,264,648.66
	Right of Way Acquisitions @		0.0%		$0.00
	Construction Administration @		15.0%		$9,484,864.98
	Design Engineering @		10.0%		$6,323,243.32
	Administration @		8.0%		$5,058,594.66
				TOTAL PROJECT COST	***$102,120,380.00***

8.2 Reconstruction Phasing Plan

The development of a Grant Road Improvement Plan reconstruction phasing plan was initiated with the analysis of candidate early intersection projects. Following the endorsement by the Grant Road Task Force of the Grant-Oracle intersection as the early intersection project, a reconstruction sequence plan for the remainder of the Grant Road Improvements was developed and endorsed by the Task Force.

8.3 Early Intersection Project

During 2008 and 2009 public outreach events, comments were received requesting consideration of an early project to highlight the innovative design concepts included in the Grant Road Improvement Plan. This request was taken to City staff, Ward offices, and the Citizen Task Force and support was received for initiating an early project. Subsequent coordination with RTA representatives determined that funding for an early project would be considered.

In June 2009, a process for developing an early project was prepared in consultation with TDOT staff. The process included the following steps:

- Define candidate early projects and conduct an analysis of each using criteria related to need for the project, opportunity of highlighting innovative design concepts, constructability, construction costs, and property impacts and costs
- Present the preferred early project to City and TAC staff for review and comment
- Present the analysis to RTA representatives to determine the level of support and funding for the preferred early project
- Present a recommended early project to the Task Force for their consideration and endorsement
- If endorsed, request RTA funding for design and right-of-way acquisition for the early project

The definition of candidate early projects recognized that the principle design concept to be featured for any project should be the indirect left-turn intersection, recommended for seven major Grant Road intersections. As a result, the initial candidates for the early project were defined as an early "intersection" projects at the following intersections: Oracle, Stone, 1st Avenue, Campbell, Country Club, Alvernon Way, and Swan.

Initial candidates were screened for constructability in terms of intersection constructability and transition to existing Grant Road and constructability of storm drain system extensions and enhancements. The definition of project limits for each of the seven candidate early intersection projects could be defined to accommodate storm drain system extensions and enhancements. However, transition to existing Grant Road was determined to be problematic for the Grant-Stone intersection and the Grant-1st intersection. It was also determined that Grant-Alvernon Way intersection would benefit by combining the project limits to include intersection improvements at Grant-Swan and Grant-Alvernon Way. The screening process resulted in the following six candidates for the early intersection project:

- Grant-Oracle
- Grant-Campbell
- Grant-Country Club
- Grant-Alvernon Way
- Grant-Swan
- Grant-Alvernon Way and Grant-Swan (combined into a single project)

Each early intersection candidate project was evaluated based on the categories listed below to facilitate identification of a preferred early intersection project.

- Project limits
- Design features (innovative Grant Road design features included in the project limits)
- Safety and congestion
- Property impacts
- Estimate of probable cost
- Estimated construction duration

The preferred early intersection project was selected as the combined Grant-Alvernon Way and Grant-Swan intersection on the basis of need for the project in terms of safety, congestion, and pedestrian activity. However, coordination with RTA determined that the cost for this project was not feasible from a funding availability perspective given other scheduled RTA funding commitments. Reconsideration of a preferred early intersection project identified the following two candidates which were supported by the RTA and TDOT staff for presentation to the Citizen Task Force.

- Grant-Oracle
- Grant-Swan

On July 28, 2009 the Task Force endorsed the Grant-Oracle intersection as the early intersection project. Final design for the Grant-Oracle Intersection Improvements Project commenced began in July 2010.

8.4 Reconstruction Phasing Concept

A reconstruction phasing concept was recommended to and endorsed by the Grant Road Task Force on December 16, 2009. Development of the reconstruction phasing concept resulted from an analytical assessment of reconstruction phasing options that considered the following.

- Construction project limits
- RTA funding schedule and project construction and right-of-way cost
- Project delivery duration
- Coordination with other projects
- Community perspectives
- Project need based on a review of safety and congestion

8.4.1 Construction Project Limits

Six projects were initially defined, including the early intersection project described above, to achieve logical project termini with project construction costs in the range of $15 million to $30 million each.

Construction project limits were also defined to allow for logical extensions and enhancements to the existing storm drain system and transitions from the construction project to existing Grant Road. The construction projects are listed below.

- Oracle intersection, 15th Ave. to Castro
- Stone -1st Avenue segment, Castro to Fremont
- Campbell segment, Fremont to Plumer
- Country Club segment, Plumer to Sparkman
- Alvernon segment, Sparkman to Bryant
- Swan segment, Bryant to Arcadia

8.4.2 RTA Funding Schedule

Meetings with representatives of the RTA were conducted to determine the extent to which construction funds would become available to fund design, utility relocation, right-of-way acquisition, and construction. It was confirmed that the construction of Grant Road improvements would take place through RTA construction periods 2 (covering fiscal years 2012-2016), 3 (covering fiscal years 2017-2021), and 4 (covering fiscal years 2022-2026). It was also determined that construction funds remaining after the construction of the early intersection project should assume a uniform distribution over construction periods 2 through 4. This assumption would provide approximately $45 million in each of the 3 construction periods.

8.4.3 Project Delivery Duration

Each construction project was reviewed with respect to the time required to design and construct the project. It was determined that each project would require approximately 3 to 4 years to design and construct. The project schedule will typically require the following durations.

- Consultant Selection and Final Design, 18 months (including 6 months for consultant selection and contract negotiation and 12 months for design)
- Right-of-way Acquisition & Relocation, 1-2 years before reconstruction start
- Utility Clearance, 12 months before reconstruction start
- Construction, 12- 15 months

8.4.4 Coordination with Other Projects

City of Tucson was consulted to identify existing and future projects in the vicinity of Grant Road. Several projects such as the 4th Avenue Bike Boulevard Design (University to Prince) and the Campbell Avenue Streetscape Project (Grant Road to Fort Lowell) are ongoing projects that have been coordinated with during the Grant Road project. Neither of these projects is expected to impact or be impacted by the construction of Grant Road improvements. Another planning project, the Oracle Area Revitalization Plan recently completed the development of a revitalization planning document which will be used as input to the design of the early intersection project at Grant-Oracle.

Two other projects however were identified which will influence the construction of Grant Road improvement.

- 1st Avenue, River to Grant will widen 1st Avenue to a 6-lane roadway with bike lanes and sidewalks. This project is RTA roadway improvement #14 which is scheduled for construction in RTA period #3 (fiscal year 2017-2021). Total funding for the project is $71.4 million.
- Railroad Underpass at Grant Road will expand the railroad underpass, east of I-10 to accommodate 6-lanes on Grant Road. This project is RTA roadway improvement #15 which is scheduled for construction in RTA period #3 (fiscal year 2017-2021). Total funding for the project is $37.4 million.

8.4.5 Community Perspectives

A survey form was distributed to property owners and tenants fronting onto Grant Road via business return mail and the project website. The survey asked for public input on reconstruction phasing. A total of 27 surveys were returned. A review of the survey forms identified three comments related to reconstruction phasing: two comments suggested that the project be constructed from west to east and on comment stressed the need to coordinate with RTA roadway improvement project #14 (1st Avenue, River to Grant) described above.

8.4.6 Project Need

Other criteria used to evaluate reconstruction phasing included a needs assessment based on the history of traffic crashes (accidents) and congestion for each construction project. Crash history was reviewed and summarized for a three year period, 2003 to 2005. Crashes were stratified by frequency, type, and severity. Congestion was determined through a comparison of available roadway capacity and the peak hour traffic volumes in 2007. The Stone-1st Avenue segment ranked first (in highest need) in both crash history and congestion. The Alvernon segment and the Country Club segment ranked second and third respectively. The Campbell segment and Grant-Oracle intersection ranked as the lowest need among the reconstruction projects.

8.4.7 Recommended Reconstruction Sequence

The recommended reconstruction phasing plan summarized in
Table 17 was presented to and endorsed by the Grant road Task Force.

Table 17. Recommended Reconstruction Sequence

RTA Construction Period	Grant Road Project	Project Limits	Segment Estimated Construction Cost	Rationale
Period 1: 2007-2011	Oracle Rd. to Stone Ave.	15th Ave. to Castro Ave.	$11 million	• Constructed as the early intersection project • Construction completed in RTA Period 2

Table 17. Recommended Reconstruction Sequence (continued)

RTA Construction Period	Grant Road Project	Project Limits	Segment Estimated Construction Cost	Rationale
Period 2: 2012-2016	Stone to 1st Avenue	Castro Ave. to Fremont Ave.	$19 million	• Ranked highest need based on crashes and congestion • Construction completed prior to RTA Period 3 in which the railroad underpass at Grant Road and the 1st Ave., River to Grant will be constructed
	Swan Rd	Bryan Ave. to Arcadia Ave.	$16 million	• Swan must be completed before Alvernon segment which is ranked as second highest need based on crashes and congestion
Period 3: 2017-2021	Campbell Ave.	Fremont Ave. to Plumer Ave.	$15 million	• Completion of Campbell segment following the widening of Campbell, south of Grant and 1st Ave., north of Grant will divert traffic on Campbell north of Grant and 1st Ave., south of Grant
	Alvernon Way	Sparkman Ave. to Bryan Ave.	$15 million	• Ranked as second highest need based on crashes and congestion
Period 4: 2022-2026	Country Club	Plumer Ave. to Sparkman Ave.	$18 million	• Grant Road reconstruction completed in RTA Period 4 (2022-2026)