

<b>Definition Table for B/C Analysis</b>	
<b>Column Title</b>	<b>Definition</b>
Site Location	Tells which site.
Treatment #	Proposed Treatment
Quantity	Amount of treatment.
Unit	Unit used for quantity.
# Fatal Crashes	Number of fatal crashes addressed by treatment
# SI Crashes	Number of Serious Injury crashes addressed by treatment
Systemic?	If the countermeasure is systemic.
Crash Types	Types of crashes that the treatments apply to.
Need to Apply for CMF Approval?	If the treatment falls on ADOT's pre-approved list it will be no.
CMF Sources	Where CMF was found.
Cost	Cost per unit.
Unit	Unit used for cost.
Annual Maint Cost	Projected annual maintenance cost.
CMF	Crash modification factor
Life	Life span of treatment
Capital Recovery Factor	Converts present value into a series of payments
Estimated CRF Reduction	Crash Reduction Factor
Total Reduction Fatal	Total amount treatment reduce the number of fatal crashes.
Total Reduction SI	Total amount treatment reduce the number of serious injury crashes.
Fatal Annual Benefit	Cost benefit of applying treatment.
DI Annual Benefit	Cost benefit of applying treatment.
Total Benefit	Total DI and Fatal benefit of applying treatment
Annual Cost	Annual cost over 5 years.

<b>Benefit / Cost Ratio Calculations</b>	
1. CMF	= Crash Modification Factor
2. CRF	= Crash Reduction Factor = 1-CMF
3. Annual Average	= Number of Crashes / 5 years
4. Total Reduction Fatal or Serious Injury	= Annual Average * Crash Reduction Factor
5. Serious Injury Annual Benefit	= Total Reduction * \$400,000
6. Fatal Annual Benefit	= Total Reduction * \$5,800,000
7. Total Benefit	= Serious Injury Annual Benefit + Fatal Annual Benefit
8a. Capital Recovery Factor	= $(\text{Interest Rate} * (1 + \text{Interest Rate})^{\text{Project Life}}) / ((1 + \text{Interest Rate})^{(1 - \text{Project Life})})$
8b. Interest Rate	= 8% , Standard from ADOT
9. Annual Construction Cost	= Total Project Cost * Capital Recovery Factor
10. Annual Cost	= Annual Maintenance Cost + Annual Construction Cost
11. B/C	= Annual Benefit / Annual Cost

Site Location	Treatment #	Quantity	Unit	# Fatal Crashes	# SI Crashes	Systemic?	Crash Types	Need to Apply for CMF Approval?	CMF Sources	Cost	Unit	Annual Maint Cost	CMF	Life	Capital Recovery Factor	Estimated CRF Reduction	Total Reduction Fatal	Total Reduction SI	Fatal Annual Benefit	DI Annual Benefit	Total Benefits	Annual Cost	Site Location											
Intersection 1: US 60 at Radanovich Globe Food Mart	1. Restripe Intersection	820	LF	1.00	2.00	no	n/a	N/A	n/a	18.00	LF	100.00	n/a	5.00	0.25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3811.82	Intersection 1: US 60 at Radanovich Globe Food Mart										
	2. Add Reflective Tape to Backplates	1	LS	1.00	2.00	no	all	NO	ADOT HSIP	1725.00	LS	100.00	0.97	20.00	0.10	0.03	0.01	0.01	34800.00	4800.00	39600.00	275.70	Intersection 1: US 60 at Radanovich Globe Food Mart											
	3. Initiate a pedestrian lead time	1	per hour	1.00	0.00	no	Pedestrian	YES	http://cmfclearinghouse.org/detail.cfm?facid=1993	100.00	per hour	100.00	0.63	20.00	0.10	0.37	0.07	0.00	429200.00	0.00	429200.00	110.19			Intersection 1: US 60 at Radanovich Globe Food Mart									
	4. Install Flashing Yellow Arrow	4	each	0.00	0.00	yes	Left Turn	YES	http://cmfclearinghouse.org/detail.cfm?facid=7698	1000.00	each	100.00	0.89	20.00	0.10	0.11	n/a	n/a	n/a	n/a	n/a	507.41				Intersection 1: US 60 at Radanovich Globe Food Mart								
	5. Protected Left Turn Phasing	4	each	0.00	0.00	no	Left Turn	NO	HSM	1000.00	each	100.00	0.94	20.00	0.10	0.06	n/a	n/a	n/a	n/a	n/a	507.41					Intersection 1: US 60 at Radanovich Globe Food Mart							
	6. Add Detectable Warnings	0	0.00	1.00	1.00	no	n/a	N/A	n/a	n/a	n/a	n/a	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a						n/a	Intersection 1: US 60 at Radanovich Globe Food Mart					
	7. Remove Trip Hazard-Ashphalt next to gutter lip	0	cyd	1.00	1.00	no	Pedestrian	N/A	n/a	10.00	cyd	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a						n/a		38.15	Intersection 1: US 60 at Radanovich Globe Food Mart			
	8. Sidewalk Repair and Extension	67	sq yd	1.00	0.00	no	Pedestrian	N/A	n/a	42.26	sq yd	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a						n/a		388.39		Intersection 1: US 60 at Radanovich Globe Food Mart		
	9. Update Pedestrian Push Buttons	8	each	1.00	0.00	no	Pedestrian	N/A	n/a	1040.00	each	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a						n/a		947.41			Intersection 1: US 60 at Radanovich Globe Food Mart	
	10. Install Directional Pedestrian Ramps	20	sq yd	1.00	0.00	no	Pedestrian	N/A	n/a	125.00	sq yd	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a						n/a		354.63				Intersection 1: US 60 at Radanovich Globe Food Mart
	11. Install Pedestrian Lighting	1	LS	1.00	0.00	no	vehicle/pedestrian	NO	ADOT HSIP	55580.00	LS	100.00	0.41	20.00	0.10	0.59	0.12	0.00	684400.00	0.00	684400.00	5760.95						Intersection 1: US 60 at Radanovich Globe Food Mart						
	Recommendation: 1, 2, 3, 8, 9, 10	1	LS	1.00	2.00	n/a	n/a	YES	See above	27585.00	LS	100.00	0.61	20.00	0.10	0.39	0.08	0.16	451124.00	62224.00	513348.00	2909.59								Intersection 1: US 60 at Radanovich Globe Food Mart				
1. Restripe Crosswalks	758	LF	0.00	1.00	no	n/a	YES	http://www.cmfclearinghouse.org/study_detail.cfm?stid=172	18.00	LF	100.00	0.63	5.00	0.25	0.37	0.00	0.07	0.00	29600.00	29600.00	3517.23	Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road												
2. Update Signing	120	SF	0.00	1.00	no	all types, urban area	YES	http://cmfclearinghouse.org/detail.cfm?facid=62	26.00	SF	100.00	0.85	10.00	0.15	0.15	0.00	0.03	0.00	12000.00	12000.00	564.97		Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road											
3. Add Reflective Tape to Backplates	1	LS	0.00	1.00	no	all	NO	ADOT HSIP	1725.00	LS	100.00	0.97	20.00	0.10	0.03	0.00	0.01	0.00	2400.00	2400.00	275.70			Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road										
4. Trim Trees/Bushes	1	LS	0.00	1.00	no	all	NO	HSM	2000.00	LS	100.00	0.97	20.00	0.10	0.73	0.15	0.00	58418.64	58418.64	303.70	Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road													
5. Update Pedestrian Signing	12	SF	0.00	1.00	no	n/a	N/A	n/a	20.00	SF	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a					n/a	135.77	Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road							
6. Provide Dashed Striping for left turns	140	LF	0.00	0.00	no	n/a	N/A	n/a	18.00	LF	100.00	0.40	5.00	0.25	n/a	n/a	n/a	n/a	n/a	n/a					n/a	7311.15			Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road					
7. Add a leading pedestrian interval to signal phasing	1	per hour	0.00	1.00	no	Pedestrian	YES	http://cmfclearinghouse.org/detail.cfm?facid=1993	100.00	per hour	100.00	0.63	20.00	0.10	0.37	0.00	0.07	n/a	29600.00	29600.00					110.19	Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road								
8. Update Pedestrian Facilities	9	each	0.00	1.00	no	Pedestrian	N/A	n/a	1040.00	each	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a					n/a						1053.34	Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road		
9. Check Overhead Lighting Levels	1	LS	0.00	0.00	no	night time	N/A	n/a	n/a	LS	n/a	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a					n/a						101.85		Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road	
10. Provide Pedestrian Lighting	1	LS	0.00	1.00	no	vehicle/pedestrian	NO	ADOT HSIP	55580.00	LS	100.00	0.41	20.00	0.10	0.59	0.00	0.12	0.00	47200.00	47200.00					5760.95						Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road			
11. Extend Raised Median on South leg and Channelized left to det del taco	1	LS	0.00	1.00	no	all types	NO	ADOT HSIP	3787.88	LS	100.00	0.61	20.00	0.10	0.39	0.00	0.08	0.00	31200.00	31200.00					485.80			Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road						
12. Recom 1 and 7	1	LS	0.00	1.00	no	Pedestrian	YES	n/a	13744.00	0.00	100.00	0.40	20.00	0.10	0.11	0.00	0.12	0.00	48248.00	48248.00					1499.86					Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road				
Recommendation: 1, 2, 3, 4, 7	1	0.00	0.00	1.00	n/a	0.00	n/a	NO	6845.00	0.00	101.00	0.22	21.00	0.10	0.78	0.00	0.16	0.00	62400.00	62400.00		784.35			Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road									
Recommendation: 1, 2, 3, 4, 7	1	0.00	0.00	2.00	n/a	0.00	N/A	NO	20589.00	0.00	101.00	n/a	21.00	0.10	0.69	n/a	0.28	n/a	110648.00	110648.00		2156.45	Intersection 2: SR 87 / BeeLine Highway SR 260/Longhorn Road											
1. Restripe Intersection Crosswalks	700	LF	0.00	0.00	no	n/a	N/A	n/a	18.00	LF	100.00	0.63	5.00	0.25	n/a	n/a	n/a	n/a	n/a	n/a		n/a		3255.75										Intersection 3: SR 260 and Manzanita/Granite Dells Road
2. Add Reflective Tape to Backplates	1	LS	1.00	2.00	no	all	NO	ADOT HSIP	1725.00	LS	100.00	0.97	20.00	0.10	0.03	0.00	0.01	0.00	4800.00	4800.00	275.70	Intersection 3: SR 260 and Manzanita/Granite Dells Road												
3. Add Leading Pedestrian Interval to Signal Phasing	1	per hour	0.00	1.00	no	Pedestrian	YES	http://cmfclearinghouse.org/detail.cfm?facid=1993	100.00	per hour	100.00	0.63	20.00	0.10	0.37	0.00	0.00	0.00	0.00	0.00	0.00			101.19			Intersection 3: SR 260 and Manzanita/Granite Dells Road							
4. Cut Back Vegetation	3000	LS	0.00	2.00	no	all	NO	HSM	1.00	LS	100.00	0.27	1.00	1.08	0.73	0.00	0.29	0.00	116837.29	116837.29	3340.00			Intersection 3: SR 260 and Manzanita/Granite Dells Road										
5. Fix Sidewalk Edge Drop Off	9	cyd	0.00	0.00	no	n/a	0.00	n/a	17.60	cyd	0.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a					16.13			Intersection 3: SR 260 and Manzanita/Granite Dells Road					
6. Update Pedestrian Facilities (Total)	1	LS	0.00	0.00	no	n/a	0.00	n/a	0.00	0.00	0.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a					2120.56						Intersection 3: SR 260 and Manzanita/Granite Dells Road		
Update Pedestrian Facilities-ped buttons and heads	8	each	0.00	0.00	no	Pedestrian	N/A	n/a	1040.00	each	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a					947.41							Intersection 3: SR 260 and Manzanita/Granite Dells Road	
Update Pedestrian Facilities-ped ramps	100	sq yd	0.00	0.00	no	Pedestrian	N/A	n/a	125.00	sq yd	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a					1373.15					Intersection 3: SR 260 and Manzanita/Granite Dells Road			
7. Install Flashing Yellow Arrow (1 section)	2	each	0.00	1.00	no	Left Turn	NO	ADOT HSIP	1000.00	each	100.00	0.84	20.00	0.10	0.11	0.00	0.03	0.00	8800.00	8800.00	268.31					Intersection 3: SR 260 and Manzanita/Granite Dells Road								
8. Install Protected/Permissive Phasing (4 section)	2	each	0.00	1.00	no	Left Turn	NO	ADOT HSIP	1000.00	each	100.00	0.84	20.00	0.10	0.16	0.00	0.03	0.00	12800.00	12800.00	303.70							Intersection 3: SR 260 and Manzanita/Granite Dells Road						
9. Install Protected Only Left Turn Phasing	4	each	0.00	1.00	no	Left Turn	NO	HSM	1000.00	each	100.00	0.94	20.00	0.10	0.06	0.00	0.01	0.00	4800.00	4800.00	507.41				Intersection 3: SR 260 and Manzanita/Granite Dells Road									
10. Provide Pedestrian Lighting	1	LS	0.00	0.00	no	vehicle/pedestrian	NO	ADOT HSIP	55580.00	LS	100.00	0.41	20.00	0.10	0.59	0.00	0.00	0.00	0.00	0.00	0.00		5760.95							Intersection 3: SR 260 and Manzanita/Granite Dells Road				
11. Install Red Light Running Cameras	1	LS	0.00	1.00	no	all (fatal)	NO	ADOT HSIP	119200.00	LS	100.00	0.76	20.00	0.10	0.24	0.00	0.05	0.00	19200.00	19200.00	12240.78		Intersection 3: SR 260 and Manzanita/Granite Dells Road											
12. Connect Sidewalk	30	sq yd	0.00	0.00	no	Pedestrian	N/A	n/a	42.26	sq yd	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	229.13												Intersection 3: SR 260 and Manzanita/Granite Dells Road
13. Move Grocery Store Driveway	0	0.00	1.00	2.00	no	n/a	N/A	n/a	250000.00	0.00	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	268.31					Intersection 3: SR 260 and Manzanita/Granite Dells Road							
14. Realign SR 260 Roadway	0	0.00	0.00	0.00	no	n/a	YES	http://cmfclearinghouse.org/results.cfm	250000.00	0.00	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	76489.16		Intersection 3: SR 260 and Manzanita/Granite Dells Road										
15. Realign Granite Dells Roadway	0	0.00	0.00	0.00	no	n/a	YES	http://cmfclearinghouse.org/results.cfm	250000.00	0.00	100.00	n/a	20.00	0.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	38294.58							Intersection 3: SR 260 and Manzanita/Granite Dells Road					
Recommendation: 1, 2, 7, 8	0	0.00	0.00	2.00	no	n/a	#N/A	#N/A	18325.00	LS	100.00	0.73	20.00	0.10	0.27	0.00	0.11	0.00	43972.48	43972.48	1966.44	Intersection 3: SR 260 and Manzanita/Granite Dells Road												
1. Add Sign Post Delineators	6	each	0.00	0.00	YES	intersection	0.00	n/a	20.00	each	0.00	0.00	10.00	0.15	n/a	n/a	n/a	n/a	n/a	n/a	n/a											17.88	Intersection 4: SR 260 and Valley Road at Highline Drive	
2. Increase STOP sign size	16	SF	0.00	0.00	NO	angle	N/A	n/a	210.00	SF	100.00	0.97	10.00	0.15	n/a	n/a	n/a	n/a	n/a	n/a	n/a										600.74	Intersection 4: SR 260 and Valley Road at Highline Drive		
3. Install Side Road Warning Signs with Distance Plaque	24	SF	1.00	0.00	NO	all types	NO	ADOT HSIP	20.00	SF	100.00	0.99	10.00	0.15	0.01	0.00	0.00	11600.00	N/A	11600.00	171.53					Intersection 4: SR 260 and Valley Road at Highline Drive								
4. Install Proper Signing for No Thru Road	13	SF	1.00	0.00	NO	n/a	N/A	n/a	20.00	SF	100.00	n/a	10.00	0.15	n/a	n/a	n/a	n/a	n/a	n/a	n/a							137.26			Intersection 4: SR 260 and Valley Road at Highline Drive			
5. Cut Back Vegetation	1	LS	0.00	1.00	YES																													

