



City of Phoenix
STREET TRANSPORTATION DEPARTMENT

August 14, 2017

Ms. Mona Aglan-Swick, P.E.
Transportation Systems Management & Operations, Traffic Safety
Arizona Department of Transportation
1615 W. Jackson ST., MD 065R
Phoenix, AZ 85007-3217

RE: Highway Safety Improvement Program (HSIP) Project Determination and Application

COG/MPO:

Agency: City of Phoenix
Project Name: 43rd Avenue Signal Improvements
Project Location: Intersections of: 43rd Avenue and Bethany-Home Road,
43rd Avenue and Glendale Avenue, and 43rd Avenue
and Northern Avenue.

Dear Ms. Aglan-Swick:

The City of Phoenix is submitting herewith a project application for local Highway Safety Improvement Program (HSIP) funding. This road safety improvement project was identified through the local network crash data screening process and meets all requirements of Title 23. The proposed request is for the improvements of three traffic signals along 43rd Avenue: Bethany Home Road, Glendale Avenue, and Northern Avenue. The improvements will add additional signal heads, and flashing yellow left turn arrows to improve the safety of the intersections. And do not include any non-infrastructure funding request. The addition of more signal heads, additional crosswalk illumination, and the flashing left turn arrows will improve the safety of the intersections. Additional heads increase the visibility of the traffic signal so drivers will notice and react sooner to the traffic control signal. The flashing yellow arrows improve the safety of left turns through the intersection. City staff will hire a consultant to complete the design, then procure bids for a contractor to build the project. There will be ground disturbing activities, including drilling for foundations, and trenching. It is anticipated that some minor utility relocations will be part of the project.

During the most recent five year period ending December 2015, the City experienced 26 total intersection related crashes including 6 fatal and 20 incapacitating crashes, at these three intersections. With a Crash Reduction Factor (CRF) of 22% obtained from the 4/5 Star countermeasures from the CMF clearinghouse list for all intersection crashes, the City could see a 5-year reduction of 5.8 crashes including 1.3 fatal and 4.5 serious injury crashes.

City of Phoenix has determined that, in accordance with 23 USC 148(a)(4)(A), this project is consistent with the MAG's and State's 2014 SHSP. It supports MAG's SHSP Goal No. 5: Reduce Severe Intersection Crashes. And supports the State's goal of (Intersections) Reduce frequency and severity of intersection crashes through traffic-control and operational improvements.
B/C Ratio = 9.8
SHSP Score = 254.8

City of Phoenix has estimated the total project cost of this project to be \$1,267,013. Of that amount request ADOT determine if \$802,303 is HSIP eligible, with \$100,800 being non-HSIP eligible, \$48,495 being local match, and \$416,215 being Other funds (if appropriate). In accordance with Title 23, the Federal share for safety improvement items are eligible to be funded at 94.3% Federal share per 23 U.S.C. 120(c) as described in Code of Federal Register 23 CFR Part 924. Therefore, the City of Phoenix proposes committing the 5.7% local match in the amount of \$48,495. Furthermore, the City of Phoenix is not requesting reimbursement for staff time for installation. Table 8 summarizes the anticipated cost estimate projected for this project.

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COG/MPO:

Agency:

City of Phoenix

City of Phoenix is aware that, if funded, additional HSIP funds above the attached estimated cost are not available to pay for excess costs and that other funds whether STP, local or other will have to be provided or secured by City of Phoenix to cover the additional costs or the project will have to be withdrawn and resubmitted in the next call-for-projects.

City of Phoenix agrees to conduct and provide to ADOT TSS on a yearly basis a written before-and-after study utilizing the same crash data included in the countermeasure influence area in order to determine the effectiveness of the countermeasure on fatal and serious injury crashes.

City of Phoenix further understands that Federal funds can only be used once to install or upgrade either a spot or systemic countermeasure and that once installed, the City of Phoenix will maintain the countermeasure at or above the standard to which it was installed.

If you have any questions, please contact me at 602-262-4613 or email carl.langford@phoenix.gov

Sincerely,



Carl Langford, PE
Safety and Neighborhood Traffic Engineer
City of Phoenix - Street Transportation Department
200 W Washington Street, 6th floor
Phoenix, AZ 85003

Attachments: Application (excel format)
Detailed City Cost Estimate
Vicinity Map
CMF Documents

ADOT HIGHWAY SAFETY IMPROVEMENT PROGRAM APPLICATION

Agency:	City of Phoenix	Title of Project:	43rd Avenue Signal Improvements
County:	Maricopa	COG/MPO:	MAG
District:	Central	HSIP Funds:	<input type="checkbox"/> STATE <input checked="" type="checkbox"/> LOCAL
Contact:		Phone:	E-Mail:
Carl Langford		602-262-4613	carl.langford@phoenix.gov
Type of Safety Improvement:	Spot: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Systemic: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
Mark all that apply to your project: <input type="checkbox"/> Design <input checked="" type="checkbox"/> Const. <input type="checkbox"/> Procurement <input type="checkbox"/> Non-Infrastructure			
Anticipated Total Cost Estimate:		\$1,267,013.09	
Anticipated dollar amount of HSIP Funding:		\$802,303.34	
Anticipated Dollar amount of Local Match (5.7%) (5.66%):		\$48,495.49	
Anticipated Dollar amount of Other:		\$416,215.20	
Funding Source: <input type="checkbox"/> 100% HSIP <input checked="" type="checkbox"/> 94.3% HSIP <input type="checkbox"/> 94.34% HSIP	Cost Estimate Tab: 8. 94.3% Spot Improvement		
Administration of Project:	Agency: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	ADOT: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
Name and Title of COG/MPO Representative:			
Basic Project Information			
Anticipated Design Year (Construction year cannot be the same):		<input type="checkbox"/> FY18 (Local) <input checked="" type="checkbox"/> FY19	
If additional ROW is needed, what FY is purchase anticipated?:		<input type="checkbox"/> FY19 <input type="checkbox"/> FY20	
Anticipated Construction Year:		<input type="checkbox"/> FY19* <input checked="" type="checkbox"/> FY20	
1.	Have lower cost countermeasures been considered or implemented?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
1a.	If "Yes", describe: If "No", explain why not:	The signal improvements needed require the signal to be rebuilt. The current mast arms will not support the additional heads and/or the correct location of the heads.	
2.	Which 23 USC 148 highway safety improvement project category does this project come under?		
2a.	1. Intersection safety improvement		
3.	Describe your safety improvement project in detail: (50 words or less)		
3a.	The project will upgrade three existing signals on 43rd Avenue, Bethany-Home Road, Glendale Ave, Northern Avenue. First countermeasures used CMF 1430 Improve visibility of signal heads. Second countermeasure flashing yellow arrow installation CMF 7695 for all crashes, and CMF 7697 for left turn crashes. Third CMF 441 Intersection Illumination.		
4.	Describe the location of this safety project:		

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4a.	Intersections of: 43rd Avenue and Bethany-Home Road, 43rd Avenue and Glednale Avenue, and 43rd Avenue and Northern Avenue.		
5.	What crash data screening method was used to identify this project?		
5a.	City staff evaluated locations that had higher crash rates especially those intersections that had higher fatality and serious injuries. Staff mapped these locations and looked for corridors where there were several intersections close to each other.		
6.	What is the safety justification for the proposed project?		
6a.	The intent of the additional signal heads and larger signal heads is to provide greater visibility and compliance to the traffic signal. The MUTCD Chapter 4D.11 states On approaches with two or more lanes for the through movement, one signal face per through lane, centered over each through lane, has also been shown to provide safer operation.		
7.	Will there be ground disturbing activities?		<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO
8.	Is project within applicants permanent ROW?		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
8a.	If NO please explain:		
9.	Will any temporary right-of-way acquisitions be required?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
10.	Will there be any utility relocation needed?		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10a.	If YES please explain:	It is likely to need some utility relocation as there are powerlines near some of the intersections and existing mast arms.	
11.	Does Section 4(f) apply to any portion of this project?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
11a.	If YES please explain:		
12.	Are there any other issues that may impact or delay development or construction of this project?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

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12a. If YES please explain:				
13. Is this project in compliance with revised ADA Standards?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
13a. If NO please explain:	It is anticipated that the pedestrian ramps will need to be upgraded to current standards at the intersections. This will be required to be done as part of the project.			
14. Does the project support Arizona's Strategic Highway Safety Plan?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
15. Are there any Studies, RSA's or Other evaluations that support this project?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
16. HSIP Roadway Functional Classification:	Urban Principal Arterial - Other			
17. Average Daily Traffic Volume and Year Collected:	ADT: 30786		Year: 2017	
18. What is the source of ADT?:	City of Phoenix - Volume Map			
19. What is the posted speed limit?	45			
20. Detailed engineer's cost estimate attached:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
"Systemic" Safety Project				
21. Completed B/C Ratio Tabulation Sheet Attached (Required):	<input type="checkbox"/> YES <input type="checkbox"/> NO			
22. Most current 5 Years Crash Data from ADOT ALISS database sorted by year & severity (required):	<input type="checkbox"/> YES <input type="checkbox"/> NO			
23. What are the inclusive dates of the crash data?				
24. Have all crashes that will not be influenced by this countermeasure been deleted from the crash list? (pedestrian, pedalcycle, etc. as applicable)	<input type="checkbox"/> YES <input type="checkbox"/> NO			
25. If purchasing equipment or materials, who will install?	<input type="checkbox"/> Town/City <input type="checkbox"/> County <input type="checkbox"/> Contractor <input type="checkbox"/> Tribe			
26. Does the project require proprietary Items (23CFR 635.411)?:	<input type="checkbox"/> YES <input type="checkbox"/> NO			
27. Is a list of locations for systemic projects provided on the attached form?	<input type="checkbox"/> YES <input type="checkbox"/> NO			
28. How are (will) the proposed locations be prioritized for replacement? (explain below)				
28a.				

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29.	Are the supporting structures in good condition, meet local standards and have an anticipated service life longer than the countermeasure being installed?		<input type="checkbox"/> YES <input type="checkbox"/> NO
"Spot" Improvement Projects Only			
30.	Completed B/C Ratio Tabulation Sheet Attached (required):		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
31.	Is the most current 5 Years Crash Data from ADOT ALISS database sorted by year & severity attached and in correct format? (required):		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
32.	What are the inclusive dates of the crash data?	2011-2015	
	Have all crashes that will not be influenced by this countermeasure been deleted from the crash list? (pedestrian, pedalcycle etc. as applicable)		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
33.	Have any infrastructure changes occurred within the work limits of this project during the years the crash data covers?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
34.	If YES please explain:		
35.	Project vicinity map is provided:		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
36.	Project work limits map is provided:		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
SHSP - All Projects			
37.	Which SHSP Emphasis Area (EA) does this project support?:	Roadway_Infrastructure_and_Operations	
37a.	Which EA Strategy does it support?:	(Intersections) Reduce frequency and severity of intersection crashes through traffic-control and operational improvements.	
37b.	Does this project support a second SHSP EA? If so, which EA.:	Nonmotorized_Users	
37c.	Which EA Strategy supports the second EA?	(Pedestrians) Improve sight distance and/or visibility between motor vehicles and pedestrians.	
37d.	Does this project support a third SHSP EA? If so, which EA.:		

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37e.	Which EA Strategy supports the third EA?			
38.	Does this project support one of the nine FHWA proven countermeasures?:			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
38a.	If so, which countermeasure?:			
39.	Does this project support one of the three Arizona Focus Areas?:			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
39a.	If so, which focus area?:		Intersection	
40.	Which HSIP Improvement Category does this project support?:		Intersection_Traffic_Control	
40a.	Which HSIP Improvement Sub-Category does this project support?:			
	Modify traffic signal – add flashing yellow arrow			
41.	Does your COG/MPO have a Strategic Transportation Safety Plan (STSP)?:			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
41a.	If "YES", does this project support an Emphasis Area in the COG/MPO STSP?:			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
41b.	List the EA:	Eliminate Death and Serious Injury Related to Intersections		
41c.	If your COG/MPO has a STSP and it was Federally Funded and you answered NO in 41a, explain why this project is being submitted over a STSP identified project.			
41d.	Rational			
42.	Are any temporary safety countermeasures needed prior to this permanent solution being installed?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
42a.	If yes, please explain:			
B/C Ratio and SHSP Score				
43.	The calculated B/C Ratio is:	9.80	The SHSP Score is:	254.80

**HIGHWAY SAFETY IMPROVEMENT PROGRAM
APPLICATION - COST ESTIMATE**

Agency:		City of Phoenix	Name of Project:		Spot Improvement with Non-HSIP construction included				
HSIP Project Cost Estimate Worksheet									
Project Cost Estimate:	Description:	Unit	Quantity:	Unit Cost:	Total Cost:	HSIP:	Local Match:	Other Amt:	TOTAL COST
						94.30%	5.70%		
Design:			1	\$ 140,500.00	\$ 140,500.00	\$ -	\$ -	\$ 140,500.00	\$ 140,500.00
ROW Acquisition:			1	\$ -	\$ -	\$ -	\$ -		\$ -
Environmental Clearance			1	\$ 100,000.00	\$ 100,000.00	\$ -	\$ -	\$ 100,000.00	\$ 100,000.00
ADOT Admin Costs:			1	\$ 10,000.00	\$ 10,000.00	\$ -	\$ -	\$ 10,000.00	\$ 10,000.00
Design Sub-Total					\$ 250,500.00	\$ 0.94	\$ -	\$ 250,500.00	\$ 250,500.00
Construction:	LM-POLE W/FOUNDATION-20ft riser	EA	12	\$ 5,630.40	\$ 67,564.80	\$ 63,713.61	\$ 3,851.19	\$ -	\$ 67,564.80
Construction:	SQ POLE W/FOUNDATION-40ft thru 60ft	EA	12	\$ 13,702.80	\$ 164,433.60	\$ 155,060.88	\$ 9,372.72	\$ -	\$ 164,433.60
Construction:	CONTROLLER CABINET and FOUNDATION	EA	3	\$ 26,928.00	\$ 80,784.00	\$ 76,179.31	\$ 4,604.69	\$ -	\$ 80,784.00
	POWER SERVICE PEDESTAL and FOUNDATION	EA	3	\$ 4,056.00	\$ 12,168.00	\$ 11,474.42	\$ 693.58	\$ -	\$ 12,168.00
	OBSERVATION CAMERA	EA	3	\$ 3,209.17	\$ 9,627.52	\$ 9,078.75	\$ 548.77	\$ -	\$ 9,627.52
	LUMINAIRE HEAD w/PHOTO CELL & LAMP	EA	24	\$ 1,110.00	\$ 26,640.00	\$ 25,121.52	\$ 1,518.48	\$ -	\$ 26,640.00
	12" 3 SECTION HEAD w/RISER (type F1)	EA	42	\$ 681.60	\$ 28,627.20	\$ 26,995.45	\$ 1,631.75	\$ -	\$ 28,627.20
	12" 4 SECTION HEAD Flashing Yellow (type FA1)	EA	24	\$ 969.66	\$ 23,271.84	\$ 21,945.35	\$ 1,326.49	\$ -	\$ 23,271.84
	Full Detection	EA	3	\$ 13,200.00	\$ 39,600.00	\$ 37,342.80	\$ 2,257.20	\$ -	\$ 39,600.00
	Misc. Wire/Conduit	EA	3	\$ 12,000.00	\$ 36,000.00	\$ 33,948.00	\$ 2,052.00	\$ -	\$ 36,000.00
	Remove Existing signal pole/poles from corner	EA	12	\$ 2,400.00	\$ 28,800.00	\$ 27,158.40	\$ 1,641.60	\$ -	\$ 28,800.00
HSIP Eligible Sub-Total			0		\$ 517,516.96	\$ 488,018.49	\$ 29,498.47	\$ -	\$ 517,516.96
Construction:	ADA RAMP (per corner)	EA	12	\$ 8,400.00	\$ 100,800.00	\$ -	\$ -	\$ 100,800.00	\$ 100,800.00
Construction:					\$ -			\$ -	\$ -
Construction:					\$ -			\$ -	\$ -
Consturction:					\$ -			\$ -	\$ -

**HIGHWAY SAFETY IMPROVEMENT PROGRAM
APPLICATION - COST ESTIMATE**

Construction:					\$ -			\$ -	\$ -
Non-HSIP Eligible Sub-Total					\$ -			\$ 100,800.00	\$ 100,800.00
Construction Sub-Total					\$ 517,516.96	\$ 488,018.49	\$ 29,498.47	\$ 100,800.00	\$ 618,316.96
Traffic Control:			10.00%		\$ 51,751.70	\$ 48,801.85	\$ 2,949.85	\$ 10,080.00	\$ 61,831.70
Mobilization:			10.00%		\$ 51,751.70	\$ 48,801.85	\$ 2,949.85	\$ 10,080.00	\$ 61,831.70
Construction Sub-Total					\$ 621,020.35	\$ 585,622.19	\$ 35,398.16	\$ 120,960.00	\$ 741,980.35
Construction Admin :			26.00%		\$ 161,465.29	\$ 152,261.77	\$ 9,203.52	\$ 31,449.60	\$ 192,914.89
Contingencies :			5.00%		\$ 31,051.02	\$ 29,281.11	\$ 1,769.91	\$ 6,048.00	\$ 37,099.02
Post Design:			1.00%		\$ 6,210.20	\$ 5,856.22	\$ 353.98	\$ 1,209.60	\$ 7,419.80
Communications:			5.00%		\$ 31,051.02	\$ 29,281.11	\$ 1,769.91	\$ 6,048.00	\$ 37,099.02
					\$ -	\$ -	\$ -	\$ -	\$ -
Post Sub-Total					\$ 229,777.53	\$ 216,680.21	\$ 13,097.32	\$ 44,755.20	\$ 274,532.73
Post Const Sub-Total					\$ 850,797.88	\$ 802,302.40	\$ 48,495.49	\$ 165,715.20	\$ 1,016,513.09
TOTAL REQUEST					\$ 1,101,297.88	\$ 802,303.34	\$ 48,495.49	\$ 416,215.20	\$ 1,267,013.09

Comments:

Required for all HSIP Applications

Agency:	City of Phoenix	Title of Project:	43rd Avenue Signal Improvements
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Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	1.20	21.4%	0.26	\$5,800,000	\$1,492,398
Incapacitating Injury	4.00	22.5%	0.90	\$400,000	\$360,362
Total Annual Benefits					\$1,852,760

Costs

Total Project Cost	\$ 1,267,013.09
Project Life (years)	10
Interest Rate (%)	8%
Capital Recovery Factor	0.1490
Annual Construction Cost	\$188,822
Annual Maintenance Cost	\$0.00
Total Annual Costs	\$188,822

Benefit / Cost

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$1,852,760	\$188,822	9.8

***REQUIRED: Use 4 and 5 star CMFs from ADOT Lists Only at Tabs 14 - 15 preferred. The CMF's CRF is used in the above calculation**

CMF 1430 - Improve visibility of signal heads (CRF=0.07)
 CMF 7695 - Flashing yellow arrow (CRF=.0147); all crash type
 CMF 7697 - Flashing yellow arrow (CRF=0.253); left turn crash type

ID	Date	Date	Time	Onroad	CrossingFeature	Int	Offset	InjurySeverity	FirstHarmful	CollisionMannerDesc	LightCondition	Weather	IntersectionTypeDesc	JunctionRelationDesc	TrafficWayType	UnitTravelDirection	UnitActionDesc	UnitRoadConditionDesc1	SurfaceCondition	EnvCondition	UnitDefect	UnitNumber	UnitEventSequence	UnitEventSequence	UnitEventSequence	UnitEventSequence	PersonSafetyDevice	PersonViolation	PersonPhysical	PersonPhysical
2515475	3/4/2011 21:12	3/4/2011	9:12:00 PM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	0	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	ANGLE (front to side)(other than left turn)	DARK_LIGHTED	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	UNKNOWN	2 - SOUTH	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT	MOTOR_VEHICLE_IN_TRANSPORT			Unknown	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2545609	8/7/2011 15:56	8/7/2011	3:56:00 PM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	0.009	INCAPACITATING_INJURY	PEDESTRIAN	HEAD_ON	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	4 - WEST	CROSSING_ROAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	No Data	1	MOTOR_VEHICLE_IN_TRANSPORT				Not Applicable	INATTENTION_DISTRACTION	NO_APPARENT_INFLUENCE	
2546812	8/18/2011 7:33	8/18/2011	7:33:00 AM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	0	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	UNKNOWN	5 - NORTHWEST	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT				Shoulder And Lap Belt	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	
2552876	8/26/2011 15:30	8/26/2011	3:30:00 PM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	0.008	INCAPACITATING_INJURY	PEDALCYCLE	OTHER	DAYLIGHT	CLEAR	LEGACY_INTERSECTION_RELATED_PRIOR_2009	INTERSECTION_RELATED_NON_INTERCHANGE	TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4 - WEST	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	No Data	1	No Data				None Used	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2705152	1/23/2013 18:21	1/23/2013	6:21:00 PM	Bethany Home Rd	43rd Ave	43rd Ave & Bethany Home Rd	0	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	LEFT_TURN	DARK_LIGHTED	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3 - EAST	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT				Air Bag Deployed/Shoulder-Lap Belt	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	
2749408	5/3/2013 23:05	5/3/2013	11:05:00 PM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	0.013	INCAPACITATING_INJURY	PEDESTRIAN	OTHER	DARK_LIGHTED	CLEAR	UNKNOWN	THRU_ROADWAY	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3 - EAST	WALKING_Against_Traffic	UNKNOWN	DRY	UNKNOWN	No Data	1	PEDESTRIAN				Not Applicable	UNKNOWN	NO_APPARENT_INFLUENCE	
2985752	8/27/2015 17:02	8/27/2015	5:02:00 PM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	0	INCAPACITATING_INJURY	Not Reported	ANGLE (front to side)(other than left turn)	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	1 - NORTH	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Shoulder And Lap Belt	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	
3005360	10/25/2015 14:11	10/25/2015	2:11:00 PM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	-0.07	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	NOT_JUNCTION_RELATED	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	6 - NORTHEAST	MAKING_LEFT_TURN	UNKNOWN	DRY	UNKNOWN	UNKNOWN	1	MOTOR_VEHICLE_IN_TRANSPORT				Shoulder And Lap Belt	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	
3015307	10/31/2015 11:14	10/31/2015	11:14:00 AM	Bethany Home Rd	43rd Ave	43rd Ave & Bethany Home Rd	0.019	INCAPACITATING_INJURY	PEDALCYCLE	ANGLE (front to side)(other than left turn)	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	THRU_ROADWAY	TWO_WAY_NOT_DIVIDED	1 - NORTH	GOING_STRAIGHT_AHEAD	UNKNOWN	DRY	UNKNOWN	No Data	1	MOTOR_VEHICLE_IN_TRANSPORT				Other	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	
3052080	11/19/2015 18:15	11/19/2015	6:15:00 PM	43rd Ave	Bethany Home Rd	43rd Ave & Bethany Home Rd	0	FATAL	PEDALCYCLE	OTHER	DARK_UNKNOWN_LIGHTING	UNKNOWN	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	UNKNOWN	3 - EAST	MAKING_RIGHT_TURN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	1	PEDALCYCLE				Unknown	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2510234	3/27/2011 1:15	3/27/2011	1:15:00 AM	43rd Ave	Glendale Ave	43rd Ave & Glendale Ave	0	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	ANGLE (front to side)(other than left turn)	DARK_LIGHTED	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED	3 - EAST	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT	MOTOR_VEHICLE_IN_TRANSPORT			Unknown	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	ALCOHOL
2558495	7/30/2011 21:24	7/30/2011	9:24:00 PM	43rd Ave	Glendale Ave	43rd Ave & Glendale Ave	0	FATAL	PEDALCYCLE	OTHER	DARK_UNKNOWN_LIGHTING	UNKNOWN	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	UNKNOWN	3 - EAST	GOING_STRAIGHT_AHEAD	UNKNOWN	UNKNOWN	UNKNOWN	No Data	1	MOTOR_VEHICLE_IN_TRANSPORT				None Used	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2687868	12/5/2012 6:15	12/5/2012	6:15:00 AM	43rd Ave	Glendale Ave	43rd Ave & Glendale Ave	0.062	INCAPACITATING_INJURY	Not Reported	SINGLE_VEHICLE	DARK_LIGHTED	CLEAR	UNKNOWN	NOT_JUNCTION_RELATED	UNKNOWN	1 - NORTH	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Helmet Used	NO_IMPROPER_ACTION	NO_APPARENT_INFLUENCE	
2747996	8/12/2013 13:23	8/12/2013	1:23:00 PM	43rd Ave	Glendale Ave	43rd Ave & Glendale Ave	0	INCAPACITATING_INJURY	Not Reported	REAR_END	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	1 - NORTH	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Air Bag Deployed	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2764148	10/8/2013 10:45	10/8/2013	10:45:00 AM	43rd Ave	Glendale Ave	43rd Ave & Glendale Ave	0	INCAPACITATING_INJURY	Not Reported	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	5 - NORTHWEST	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Air Bag Deployed/Shoulder-Lap Belt	UNKNOWN	NO_APPARENT_INFLUENCE	
2941799	11/23/2014 21:38	11/23/2014	9:38:00 PM	43rd Ave	Glendale Ave	43rd Ave & Glendale Ave	-0.014	FATAL	PEDESTRIAN	OTHER	DARK_LIGHTED	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	4 - WEST	CROSSING_ROAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	No Data	1	MOTOR_VEHICLE_IN_TRANSPORT				Not Applicable	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	ALCOHOL
2978873	4/20/2015 0:29	4/20/2015	12:29:00 AM	Glendale Ave	43rd Ave	43rd Ave & Glendale Ave	0.033	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	ANGLE (front to side)(other than left turn)	DARK_LIGHTED	CLEAR	FOUR_WAY_INTERSECTION	NOT_JUNCTION_RELATED	TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	99 - UNKNOWN	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT				Shoulder And Lap Belt	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	
2984322	5/14/2015 8:50	5/14/2015	8:50:00 AM	43rd Ave	Glendale Ave	43rd Ave & Glendale Ave	0	FATAL	MOTOR_VEHICLE_IN_TRANSPORT	LEFT_TURN	DAYLIGHT	UNKNOWN	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	UNKNOWN	1 - NORTH	GOING_STRAIGHT_AHEAD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	1	MOTOR_VEHICLE_IN_TRANSPORT				Helmet Used	SPEED_TOO_FAST_FOR_CONDITIONS	NO_APPARENT_INFLUENCE	
3053904	11/24/2015 5:40	11/24/2015	5:40:00 AM	Glendale Ave	43rd Ave	43rd Ave & Glendale Ave	0	FATAL	PEDALCYCLE	OTHER	DAWN	UNKNOWN	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	ONE_WAY_TRAFFICWAY	3 - EAST	GOING_STRAIGHT_AHEAD	UNKNOWN	UNKNOWN	UNKNOWN	No Data	1	MOTOR_VEHICLE_IN_TRANSPORT				None Used	UNKNOWN	NO_APPARENT_INFLUENCE	
2456020	3/29/2011 15:29	3/29/2011	3:29:00 PM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	0	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	NOT_JUNCTION_RELATED	UNKNOWN	1 - NORTH	GOING_STRAIGHT_AHEAD	UNKNOWN	DRY	UNKNOWN	UNKNOWN						Air Bag Deployed/Shoulder-Lap Belt	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2551758	5/25/2011 19:46	5/25/2011	7:46:00 PM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	-0.114	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	ANGLE (front to side)(other than left turn)	DARK_LIGHTED	CLEAR	UNKNOWN	NOT_JUNCTION_RELATED	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3 - EAST	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT				None Used	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	ALCOHOL
2593553	12/1/2011 19:13	12/1/2011	7:13:00 PM	Northern Ave	43rd Ave	43rd Ave & Northern Ave	0.009	INCAPACITATING_INJURY	Not Reported	OTHER	DARK_LIGHTED	RAIN	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	2 - SOUTH	MAKING_LEFT_TURN	No Data	WET	MOVING_VEHICLE	No Data	1	No Data				Shoulder And Lap Belt	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	
2600935	12/21/2011 4:57	12/21/2011	4:57:00 AM	Northern Ave	43rd Ave	43rd Ave & Northern Ave	0	FATAL	MOTOR_VEHICLE_IN_TRANSPORT	ANGLE (front to side)(other than left turn)	DARK_LIGHTED	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4 - WEST	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT	OVERTURN_ROLLOVER	CURB	TRAFFIC_SIGNAL_SUPPORT	None Used	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2693091	2/6/2012 1:40	2/6/2012	1:40:00 AM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	0.034	INCAPACITATING_INJURY	Not Reported	OTHER	DARK_LIGHTED	CLOUDY	UNKNOWN	NOT_JUNCTION_RELATED	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3 - EAST	CROSSING_ROAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	No Data	1	No Data				None Used	DID_NOT_USE_CROSSWALK	NO_APPARENT_INFLUENCE	
2705539	1/17/2013 8:30	1/17/2013	8:30:00 AM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	0.019	INCAPACITATING_INJURY	Not Reported	REAR_END	DAYLIGHT	CLEAR	UNKNOWN	NOT_JUNCTION_RELATED	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	2 - SOUTH	GOING_STRAIGHT_AHEAD	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Air Bag Deployed/Shoulder-Lap Belt	SPEED_TOO_FAST_FOR_CONDITIONS	NO_APPARENT_INFLUENCE	
2762191	9/26/2013 15:48	9/26/2013	3:48:00 PM	Northern Ave	43rd Ave	43rd Ave & Northern Ave	0.023	INCAPACITATING_INJURY	Not Reported	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	2 - SOUTH	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Air Bag Deployed	FAILED_TO_YIELD_RIGHT_OF_WAY	NO_APPARENT_INFLUENCE	

Id	Date	Date	Time	Onroad	CrossingFeature	Int	Offset	InjurySeverity	FirstHarmful	CollisionMannerDesc	LightCondition	Weather	IntersectionTypeDesc	JunctionRelationDesc	TrafficWayType	UnitTravelDirectionD	UnitActionDesc	UnitRoadConditionDesc1	SurfaceCondition	EnvCondition	UnitDefect	UnitNumber	UnitEventSequence	UnitEventSequence	UnitEventSequence	UnitEventSequence	PersonSafetyDevice	PersonViolation	PersonPhysical	PersonPhysical
2768727	10/22/2013 13:54	10/22/2013	1:54:00 PM	Northern Ave	43rd Ave	43rd Ave & Northern Ave	0	INCAPACITATING_INJURY	Not Reported	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4 - WEST	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Shoulder And Lap Belt	DISREGARDED_TRAFFIC_SIGNAL	NO_APPARENT_INFLUENCE	
2771564	10/31/2013 17:47	10/31/2013	5:47:00 PM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	0.038	INCAPACITATING_INJURY	Not Reported	LEFT_TURN	DUSK	CLEAR	FOUR_WAY_INTERSECTION	NOT_JUNCTION_RELATED	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	2 - SOUTH	STOPPED_IN_TRAFFICWAY	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Shoulder And Lap Belt	MADE_IMPROPER_TURN	NO_APPARENT_INFLUENCE	
2807607	1/20/2014 17:46	1/20/2014	5:46:00 PM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	0	INCAPACITATING_INJURY	Not Reported	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	5 - NORTHWEST	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Shoulder And Lap Belt	MADE_IMPROPER_TURN	NO_APPARENT_INFLUENCE	
2918504	10/25/2014 20:42	10/25/2014	8:42:00 PM	Northern Ave	43rd Ave	43rd Ave & Northern Ave	-0.023	INCAPACITATING_INJURY	CURB	OTHER	DARK_LIGHTED	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_RELATED_NON_INTERCHANGE	TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	3 - EAST	OVERTAKING_PASSING	UNKNOWN	DRY	UNKNOWN	UNKNOWN	1	CURB	MOTOR_VEHICLE_IN_TRANSPORT	MOTOR_VEHICLE_IN_TRANSPORT		Air Bag Deployed	OTHER_UNSAFE_PASSING	NO_APPARENT_INFLUENCE	
2949853	1/26/2015 14:49	1/26/2015	2:49:00 PM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	0	INCAPACITATING_INJURY	Not Reported	LEFT_TURN	DAYLIGHT	CLOUDY	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	UNKNOWN	1 - NORTH	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	No Data				Shoulder And Lap Belt	MADE_IMPROPER_TURN	NO_APPARENT_INFLUENCE	
3057050	10/15/2015 12:32	10/15/2015	12:32:00 PM	43rd Ave	Northern Ave	43rd Ave & Northern Ave	0	INCAPACITATING_INJURY	MOTOR_VEHICLE_IN_TRANSPORT	LEFT_TURN	DAYLIGHT	CLEAR	FOUR_WAY_INTERSECTION	INTERSECTION_NON_INTERCHANGE	TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	2 - SOUTH	MAKING_LEFT_TURN	NO_CONTRIBUTING_CIRCUMSTANCES	DRY	NO_CONTRIBUTING_CIRCUMSTANCES	NO_CONTRIBUTING_CIRCUMSTANCES	1	MOTOR_VEHICLE_IN_TRANSPORT				Shoulder And Lap Belt	MADE_IMPROPER_TURN	NO_APPARENT_INFLUENCE	

	CD		STXXXXXXXX		Q.S.		Date		
Construction	Qty	Unit	Unit Cost	Total Cost 16/17	Total Cost 17/18	Total Cost 18/19	Total Cost 19/20	Total Cost 20/21	
ADA RAMP (per corner)	12	EA	\$ 8,400.00	\$ 100,800.00					
			\$ -	\$ -					
A-POLE W/FOUNDATION- 20ft	0	EA	\$ 4,016.40	\$ -					
LM-POLE W/FOUNDATION-20ft riser	12	EA	\$ 5,630.40	\$ 67,564.80					
SQ POLE W/FOUNDATION- 40ft thru 60ft	12	EA	\$ 13,702.80	\$ 164,433.60					
CONTROLLER CABINET and FOUNDATION	3	EA	\$ 26,928.00	\$ 80,784.00					
POWER SERVICE PEDESTAL and FOUNDATION	3	EA	\$ 4,056.00	\$ 12,168.00					
OBSERVATION CAMERA	3	EA	\$ 3,209.17	\$ 9,627.52					
LUMINAIRE HEAD w/PHOTO CELL & LAMP	24	EA	\$ 1,110.00	\$ 26,640.00					
12" 3 SECTION HEAD w/RISER (type F1)	42	EA	\$ 681.60	\$ 28,627.20					
12" 4 SECTION HEAD Flashing Yellow (type FA1)	24	EA	\$ 969.66	\$ 23,271.84					
Full Detection	3	EA	\$ 13,200.00	\$ 39,600.00					
Misc. Wire/Conduit	3	EA	\$ 12,000.00	\$ 36,000.00					
Remove Existing signal pole/poles from corner	12	EA	\$ 2,400.00	\$ 28,800.00					

Construction				\$ 618,316.96	\$ 711,064.50	\$ 803,812.04	\$ 896,559.59	\$ 989,307.13	\$ 1,244,362.88
SWPP Allowance (.7%)				\$ 4,328.22	\$ 4,977.45	\$ 5,626.68	\$ 6,275.92	\$ 6,925.15	\$ 8,710.54
Traffic Control/Police Officer (1% Local, 4% collector, 5% major)			5%	\$ 30,915.85	\$ 35,553.23	\$ 40,190.60	\$ 44,827.98	\$ 49,465.36	\$ 62,218.14
Contingency (20%)				\$ 123,663.39	\$ 142,212.90	\$ 160,762.41	\$ 179,311.92	\$ 197,861.43	\$ 248,872.58
Total Project Construction Cost				\$ 777,224.41	\$ 893,808.08	\$ 1,010,391.74	\$ 1,126,975.40	\$ 1,243,559.06	\$ 1,564,164.13
Design			12% of Construction	\$ 93,266.93	\$ 107,256.97	\$ 121,247.01	\$ 135,237.05	\$ 149,227.09	\$ 187,699.70
DCM Design Administration Fee			25% of Design	\$ 23,316.73	\$ 26,814.24	\$ 30,311.75	\$ 33,809.26	\$ 37,306.77	\$ 46,924.92
APS/SRP Design Fee	1	EA	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00
ADOT Design Review Fee	1	EA	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00
PIO See List Below		1	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00
Procurement - Design	1	EA	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00
Project Handoff Admin - TPP/ENV/UTIL	1	EA	\$ 6,520.00	\$ 6,520.00	\$ 6,520.00	\$ 6,520.00	\$ 6,520.00	\$ 6,520.00	\$ 6,520.00
State Land Acquisition	0	SF	\$ 10.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
State Land Admin per property of State Land	0	EA	\$ 17,250.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ROW Acquisition per square foot of land	0	SF	\$ 10.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Real Estate Admin per property (Collector, Major)	0	EA	\$ 11,750.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Real Estate TCE Charge for Federal Aid projects	1	EA	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00
ROW Easements (Local)	0	EA	\$ 3,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Environmental Monitoring/Archeology (\$25K Local, \$50K Collector, \$100K Major) Use unless the Environmental section submits an estimate	1	Job	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00
DCM Construction Administration Fee - See list below for %		1	20%	\$ 155,444.88	\$ 178,761.62	\$ 202,078.35	\$ 225,395.08	\$ 248,711.81	\$ 312,832.83
Procurement - Construction	1	EA	\$ 8,000.00	\$ 8,000.00	\$ 8,000.00	\$ 8,000.00	\$ 8,000.00	\$ 8,000.00	\$ 8,000.00
Testing & Materials (1%)		EA	1% of Construction	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24
Utilities Adjustment (5%)			5% of Construction	\$ 38,861.22	\$ 38,861.22	\$ 38,861.22	\$ 38,861.22	\$ 38,861.22	\$ 38,861.22
Utility Inspection			1% of Construction	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24	\$ 7,772.24
Inflation Year 16-17 thru 20-21				0	1.15	1.30	1.45	1.60	1.75

Project Grand Total				\$ 1,265,978.67	\$ 1,423,366.61	\$ 1,580,754.56	\$ 1,738,142.50	\$ 1,895,530.44	
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Use these figures to fill in Project Number Request form for Fiscal

Design	\$ 93,266.93	\$ 107,256.97	\$ 121,247.01	\$ 135,237.05	\$ 149,227.09
Other Agency	\$ 20,000.00	\$ 20,000.00	\$ 20,000.00	\$ 20,000.00	\$ 20,000.00
Design Admin	\$ 46,836.73	\$ 50,334.24	\$ 53,831.75	\$ 57,329.26	\$ 60,826.77
ROW	\$ -	\$ -	\$ -	\$ -	\$ -
ROW Admin	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00	\$ 10,800.00
Construction	\$ 777,224.41	\$ 893,808.08	\$ 1,010,391.74	\$ 1,126,975.40	\$ 1,243,559.06
Construction Admin	\$ 178,989.37	\$ 202,306.10	\$ 225,622.84	\$ 248,939.57	\$ 272,256.30
Environmental	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00
Utilities	\$ 38,861.22	\$ 38,861.22	\$ 38,861.22	\$ 38,861.22	\$ 38,861.22
Total	\$ 1,265,978.67	\$ 1,423,366.61	\$ 1,580,754.56	\$ 1,738,142.50	\$ 1,895,530.44



CMF / CRF Details

CMF ID: 1430

Improve visibility of signal heads

Description:

Prior Condition: Improvements included one or more of the following: signal lens size upgrade, installing new backboards, adding reflective tape to existing backboards, and installing additional signal heads.

Category: Intersection traffic control

Study: [Evaluating the Safety Impacts of Improving Signal Visibility at Urban Signalized Intersections, Sayed et al., 2007](#)

Star Quality Rating: ★★★★★ [\[View score details\]](#)

Crash Modification Factor (CMF)

Value: 0.93

Adjusted Standard Error:

Unadjusted Standard Error:

Crash Reduction Factor (CRF)

Value: 7 (This value indicates a **decrease** in crashes)

Adjusted Standard Error:

Unadjusted Standard Error:

Applicability

Crash Type: All

Crash Severity: All

Roadway Types: Not specified

Number of Lanes:

Road Division Type:

Speed Limit: 50 km/h (30 mph)

Area Type: Urban

Traffic Volume:

Time of Day: All

If countermeasure is intersection-based

Intersection Type: Roadway/roadway (not interchange related)

Intersection Geometry: 4-leg

Traffic Control: Signalized

Major Road Traffic Volume:

Minor Road Traffic Volume:

Development Details

Date Range of Data Used: 1999 to 2004

Municipality: City of Burnaby, City of Coquitlam, City of Kelowna, City of New Westminster, City of North Vancouver, City of Surrey

State:

Country:

Type of Methodology Used: Before/after using empirical Bayes or full Bayes

Sample Size Used: Sites

Before Sample Size Used: 171 Sites

After Sample Size Used: 171 Sites

Other Details

Included in Highway Safety Manual? No

Date Added to Clearinghouse: Dec-01-2009

Comments:

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For more information, contact **Karen Scurry**, FHWA Office of Safety Programs 609-637-4207

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CMF / CRF Details

CMF ID: 7695

Change from 5-section "doghouse" protected/permmissive left turn to FYA - protected/permmissive left turn

Description: Change from 5-section "doghouse" protected/permmissive left turn to FYA protected/permmissive left turn

Prior Condition: 5 section doghouse signal

Category: Intersection traffic control

Study: [Safety Effectiveness of Flashing Yellow Arrow: Evaluation of 222 Signalized Intersections in North Carolina, Simpson and Troy, 2015](#)

Star Quality Rating: ★★★★★ [View score details]

Crash Modification Factor (CMF)

Value: 0,853

Adjusted Standard Error:

Unadjusted Standard Error: 0,048

Crash Reduction Factor (CRF)

Value: 14,7 (This value indicates a **decrease** in crashes)

Adjusted Standard Error:

Unadjusted Standard Error: 4,8

Applicability

Crash Type: All

Crash Severity: Fatal,Serious injury,Minor injury

Roadway Types: Not specified

Number of Lanes:

Road Division Type:

Speed Limit:	20-55
Area Type:	Not specified
Traffic Volume:	
Time of Day:	Not specified
<i>If countermeasure is intersection-based</i>	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 5300 to Maximum of 52000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 300 to Maximum of 26500 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	2003 to 2013
Municipality:	
State:	NC
Country:	
Type of Methodology Used:	Other before/after
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov-01-2015
Comments:	

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CMF / CRF Details

CMF ID: 7697

Change from 5-section "doghouse" protected/permmissive left turn to FYA - protected/permmissive left turn

Description: Change from 5-section "doghouse" protected/permmissive left turn to FYA protected/permmissive left turn

Prior Condition: 5 section doghouse signal

Category: Intersection traffic control

Study: [*Safety Effectiveness of Flashing Yellow Arrow: Evaluation of 222 Signalized Intersections in North Carolina, Simpson and Troy, 2015*](#)

Star Quality Rating: ★★★★★ [View score details]

Crash Modification Factor (CMF)

Value: 0.747

Adjusted Standard Error:

Unadjusted Standard Error: 0.067

Crash Reduction Factor (CRF)

Value: 25.3 (This value indicates a **decrease** in crashes)

Adjusted Standard Error:

Unadjusted Standard Error: 6.7

Applicability

Crash Type: Left turn

Crash Severity: Fatal,Serious injury,Minor injury

Roadway Types: Not specified

Number of Lanes:

Road Division Type:

Speed Limit:	20-55
Area Type:	Not specified
Traffic Volume:	
Time of Day:	Not specified
<i>If countermeasure is intersection-based</i>	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 3500 to Maximum of 52000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 300 to Maximum of 26500 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	2003 to 2013
Municipality:	
State:	NC
Country:	
Type of Methodology Used:	Other before/after
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov-01-2015
Comments:	Target crashes are defined as "left-turn same roadway crashes with the left-turner on an approach treated with FYA and occurring during the time of day when FYA is in operation".

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CMF / CRF Details

CMF ID: 441

Provide intersection illumination

Description:

Prior Condition: *No Prior Condition(s)*

Category: Highway lighting

Study: *Handbook of Road Safety Measures, Elvik, R. and Vaa, T., 2004*

Star Quality Rating: ★★★★★

Crash Modification Factor (CMF)

Value: 0.41

Adjusted Standard Error: 0.2

Unadjusted Standard Error:

Crash Reduction Factor (CRF)

Value: 59 (This value indicates a **decrease** in crashes)

Adjusted Standard Error: 20

Unadjusted Standard Error:

Applicability

Crash Type: Vehicle/pedestrian

Crash Severity: Serious injury, Minor injury

Roadway Types: Not specified

Number of Lanes:

Road Division Type:

Speed Limit:

Area Type: Not specified

Traffic Volume:

Time of Day:

If countermeasure is intersection-based

Intersection Type: Roadway/roadway (not interchange related)

Intersection Geometry: Not specified

Traffic Control: Not specified

Major Road Traffic Volume:

Minor Road Traffic Volume:

Development Details

Date Range of Data Used:

Municipality:

State:

Country:

Type of Methodology Used: Meta-analysis

Sample Size Used:

Other Details

Included in Highway Safety Manual? No

Date Added to Clearinghouse: Dec-01-2009

Comments: Countermeasure name has been slightly modified for consistency across Clearinghouse

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