May 10, 2019

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

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

Agency:	City of Glendale
Project Name:	Installation of Pedestrian Hybrid Becon (HAWK)
Project Location:	67th Avenue at Montebello Avenue, Glendale, AZ

Dear Ms. Aglan-Swick:

The City of Glendale is submitting herewith a project application for 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 installation of pedestrian activated hybrid beacon (HAWK) and does not include any non-infrastructure funding request. The HAWK signal will facilitate the safe crossing movement for the pedestrians across 67th Avenue at Montebello Avenue. The City requests ADOT to administer the design, procurement and construction of this project. ADOT 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 need to happen.

During the most recent five-year period ending December 2017, the City experienced one pedestrian crash that resulted in fatality. With the large number of pedestrians crossing 67th Avenue at Montebello Avenue a HAWK is identified as the countermeasure to reduce pedestrain crashes and to protect the pedestrians at this intersection. With a Crash Reduction Factor (CRF) of 56.8% obtained from the ADOT 4/5 Star list for all pedestrian crashes, the City could see a 5-year reduction of pedestrian crashes including fatal and serious injury crashes.

The City of Glendale has determined that, in accordance with 23 USC 148(a)(4))(A), this project is consistent with the MAG and State's 2014 SHSP. It supports MAG's STSP Action Area - "Eliminate Death and Injury Related to Intersections" and Arizona SHSP Emphasis Area "non-motorized road users" with the supporting strategy to reduce pedestrian exposure to vehicles. It also supports the State's SHSP goal for Nonmotorized users - "Reduce frequency and severity of crashes involving nonmotorized users by reducing their exposure to vehicular traffic".

B/C Ratio = 16.60 (Element 52 in Application, Tab 2)

City of Glendale has estimated the total project cost of this project to be $434,786. All of the $434,786 is HSIP eligible, with no non-HSIP eligible elements and no local match, and no other funds. In accordance with Title 23, the Federal share for safety improvement items are eligible to be funded at 100% Federal share per 23 U.S.C. 120(c) as described in Code of Federal Register 23 CFR Part 924. Therefore, the City of Glendale does not propose to contribute any match for the above mentioned project. Furthermore, the City of Glendale is not requesting reimbursement for staff time for installation. The attached Table summarizes the anticipated cost estimate projected for this project.

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

Agency: City of Glendale

Project Name: Installation of Pedestrian Hybrid Becon (HAWK)

The City of Glendale 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 be secured by the City of Glendale to cover the additional costs or the project will have to be withdrawn and resbumitted in the next call-for-projects.

The City of Glendale 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 conuntermeasure on fatal and serious injury crashes.

The City of Glendale 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 Glendale will maintain the countermeasure at or above the standard to which it was installed.

If you have any questions, please contact me at 623-930-2939 or email DAlbert@glendaleaz.com .

Sincerely,

Deb A Albert

Debbie Albert, P.E., PTOE
City Traffic Engineer
City of Glendale
6210 W. Myrtle Ave STE#112, Glendale, AZ 85301

Attachments: Application (excel format) to include cost estimate, vicinity map and/or list of locations
B/C Ratio and Crash Data

Agency:	City of Glendale	**Title of Project:**	Installation of Pedestrian Hybrid Becon (HAWK)
County:	Maricopa	**COG/MPO:**	MAG
District:	Central	**Date:**	5/8/2019

Contact:	**Phone:**	**E-Mail:**
Kiran Guntupalli	623-930-2951	kguntupalli@glendaleaz.com

Type of Safety Improvement:	**Spot:** ☑ YES	☐ NO	**Systemic:**	☐ YES	☐ NO
Mark all that apply to your project:	☑ Design	☑ Construction	☑ Procurement	☐ Non-Infrastructure	

Anticipated Total Cost Estimate:	**$391,473**	
Anticipated dollar amount of HSIP Funding:	**$391,473**	
Anticipated Dollar amount of Local Match (5.7%) (5.66%):	**$0.00**	
Anticipated Dollar amount of Other:	**$0.00**	

Funding Source:	☑ 100% HSIP	☐ 94.3%	☐ 94.34% HSIP	**Cost Estimate Tab:** 5. 100% Contract Install

Administration of Project:	**Agency:**	☐ YES	☑ NO	**ADOT:** ☑ YES	☐ NO
Name and Title of COG/MPO Representative:	Margaret Herrera, MAG Transportation Safety Program Manager				

Basic Project Information

Anticipated Design Year (Construction year cannot be the same):	☑ FY23	
If additional ROW is needed, what FY is purchase anticipated?:	☑ FY23	☐ FY24
Anticipated Construction Year:	☑ FY24	

1.	**Have lower cost countermeasures been considered or implemented?**	☑ YES ☐ NO
1a.	**If "Yes", describe:** **If "No", explain why not:**	Stop sign, ADA ramps and crosswalk
2.	**Which 23 USC 148 highway safety improvement project category does this project come under?**	
2a.	5. Improvement for pedestrian or bicyclist safety or safety of persons with disabilities	
3.	**Describe your safety improvement project in detail: (50 words or less)**	
3a.	This is is a 3-leg urban intersection with stop control on Montebello Avenue (minor street). It has experienced a pedestrian fatality over th elast 5 years. The adjacent land uses is residential and commercial, which results in considerable number of pedestrains crossing 67th Avenue. Traffic volumes showed more than 20 pedestrain crossing in each hour for at least 5 hours during the day. It is proposed to install a pedestrain activated hybrid beacon (HAWK) on 67th Avenue near Montebello Avenue. CMF Clearinghouse provides a 4-Star CMF (ID: 9021) with a Crash Reduction Factor (CRF) of 56.8%, which was used to calculate the B/C ratio for this project.	
4.	**Describe the location of this safety project:**	

Agency:	City of Glendale		**Title of Project:**	Installation of Pedestrian Hybrid Becon (HAWK)
County:	Maricopa		**COG/MPO:**	MAG
District:	Central		**Date:**	5/8/2019
4a.	on 67th Avenue at Montebellow Avenue (north side of Montebellow Ave)			
5.	**What crash data screening method was used to identify this project?**			
5a.	Crash data downloaded from ADOT ACIS was provided by MAG for this intersection. The data was analysed to see crash patterns and identify risk factors. A HAWK warrant analysis was done to check if a HAWK is warranted at this intersection.			
6.	**What is the safety justification for the proposed project?**			
6a.	This intersection has experienced a pedestrain fatality in the last five years. Traffic volumes shows more than 20 pedestrains crossing 67th Avenue for at least 5 hours of the day. The ADT on 67th Ave is approximately 26,000 vehicles. The pedestrian volumes meet the HAWK warrant, the adjancet land uses induce crossing 67th Avenue. The fatal crash that occured at this intersection has resulted in the recommendation for the HAWK to mitigate the crash risk associated with pedestrain crashes.			
7.	**Will there be ground disturbing activities?**	☑ YES ☐ NO		
8.	**Is project within applicants permanent ROW?**	☑ YES ☐ NO		
8a.	**If NO please explain:**			
9.	**Will any temporaty right-of-way acquisitions be required?**	☐ YES ☑ NO		
10.	**Will there be any utility relocation needed?**	☑ YES ☐ NO		
10a.	**If YES please explain:**	underground utilities are assumed in this area. These were not field verified at the time of this application		
11.	**Does Section 4(f) apply to any portion of this project?**	☐ YES ☑ NO		
11a.	**If YES please explain:**			
12.	**Are there any other issues that may impact or delay development or construction of this project?**	☐ YES ☑ NO		
12a.	**If YES please explain:**			
13.	**Is this project in compliance with revised ADA Standards?**	☑ YES ☐ NO		
13a.	**If NO please explain:**			
14.	**Does the project support Arizona's Strategic Highway Safety Plan?**	☑ YES ☐ NO		
15.	**Are there any Studies, RSA's or Other evaluations that support this project?**	☐ YES ☑ NO		
16.	**If the project is a traffic control device requiring a warrant, is a copy attached?**	☑ YES ☐ NO		
17.	**HSIP Roadway Functional Classification:**	Urban Minor Arterial		
18.	**For projects on State System:**	**BMP:**	**EMP:**	
19.	**Average Daily Traffic Volume and Year Collected:**	ADT: 25,500	Year:2015	

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County:	Maricopa	**COG/MPO:**	MAG
District:	Central	**Date:**	5/8/2019

20.	**What is the source of ADT?:**	City of Glendale Website
21.	**What is the posted speed limit?**	45
22.	**Detailed engineer's cost estimate attached:**	☑ YES ☐ NO

"Systemic" Safety Project

23.	**Completed B/C Ratio Tabulation Sheet Attached (Required):**	☐ YES ☐ NO
24.	**Most current 5 Years Crash Data from ADOT ALISS database sorted by year & severity (required):**	
25.	**What are the inclusive dates of the crash data?**	
26.	**Have all crashes that will not be influenced by this countermeasure been deleted from the crash list? (pedestrian, pedalcycle, etc. as applicable)**	
27.	**If purchasing equipment or materials, who will install?**	☐ Town/City ☐ County ☐ Tribe ☐ Contractor
28.	**Does the project require proprietary Items (23CFR 635.411)?:**	☐ Yes ☐ No
29.	**Is a list of locations for systemic projects provided on the attached form?**	☐ Yes ☐ No
30.	**How are (will) the proposed locations be prioritized for replacement? (explain below)**	
30a.		
31.	**Are the supporting structures in good condition, meet local standards and have an anticipated service life longer than the countermeasure being installed?**	☐ Yes ☐ No

"Spot" Improvement Projects Only

32.	**Completed B/C Ratio Tabulation Sheet Attached (required):**	☑ YES ☐ NO
33.	**Is the most current 5 Years Crash Data from ADOT ALISS database sorted by year & severity attached and in correct format? (required):**	☑ YES ☐ NO
34.	**What are the inclusive dates of the crash data?**	2013-2017
35.	**Have all crashes that will not be influenced by this countermeasure been deleted from the crash list? (pedestrian, pedalcycle etc. as applicable)**	yes
36.	**Have any infrastructure changes occurred within the work limits of this project during the years the crash data covers?**	☐ YES ☑ NO
37.	**If YES please explain:**	
38.	**Project vicinity map is provided:**	☑ YES ☐ NO
39.	**Project work limits map is provided:**	☑ YES ☐ NO

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SHSP - All Projects

40.	**Which SHSP Emphasis Area (EA) does this project support?:**	Nonmotorized_Users	
40a.	**Which EA Strategy does it support?:**	(Pedestrians) Reduce pedestrian exposure to vehicle traffic.	
40b.	**Does this project support a second SHSP EA? If so, which EA.:**	Roadway_Infrastructure_and_Operations	
40c.	**Which EA Strategy supports the second EA?**	(Intersections) Reduce frequency and severity of intersection crashes through traffic-control and operational improvements.	
40d.	**Does this project support a third SHSP EA? If so, which EA.:**		
40e.	**Which EA Strategy supports the third EA?**		
41.	**Does this project support one of the nine FHWA proven countermeasures?:**	☑ YES ☐ NO	
41a.	**If so, which countermeasure?:**	Pedestrian Hybrid Beacon	
42.	**Does this project support one of the three Arizona Focus Areas?:**	☑ YES ☐ NO	
42a.	**If so, which focus area?:**	**Pedestrian**	
43.	**Which HSIP Improvement Category does this project support?:**	**Pedestrians_and_Bicyclists**	
43a.	**Which HSIP Improvement Sub-Category does this project support?:**	Pedestrian beacons	
44.	**Does your COG/MPO have a Strategic Transportation Safety Plan (STSP)?:**	☑ YES ☐ NO	
44a.	**If "YES", does this project support an Emphasis Area in the COG/MPO STSP?:**		
44b.	**List the EA:**	Eliminate Death and Injury Related to Intersections	
44c.	**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. (For Local Agencies Only)**		
44d.	**Rational:**		
45.	**Are any temporaty safety countermeasures needed prior to this permanent solution being installed?**		

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45a.	**If yes, please explain:**				
46.	**For State Agencies, has the Regional Traffic Engineer been made aware of this potential project and does he/she concur with it?**			☐ YES ☐ NO	
Stratigic Transportation Safety Plans Funds (COG/MPO)					
47.	**What is the date of your last STSP or update completed?**				
48.	**How many projects that were identified In your last STSP or update were submitted for HSIP funding?**				
49.	**What was the total dollar amount of the projects in question 45?**				
50.	**How many projects that were submitted for HSIP funding were eligible and funded by ADOT?**				
51.	**What was the total dollar amount of the projects in question 47?**				
B/C Ratio					
52.	**The calculated B/C Ratio is:**	**18.50**	**CMF ID Number:**	9021.00	
			2nd CMF ID No.:		
			3rd CMF ID NO.:		

HIGHWAY SAFETY IMPROVEMENT PROGRAM
APPLICATION - COST ESTIMATE

Agency:	Glendale, Arizona	Name of Project:	Installation of HAWK at 67th Avenue at Montebellow Avenue		Non-State Agency Cost Estimate - Countermeasure 100% HSIP Eligible					
HSIP Project (Installatio of Pedestrain Hybrid Beacon and ADA ramps) Cost Estimate Worksheet										
Project Cost Estimate:	**Description:**	**Unit of Measurement**	**Quantity:**	**Unit Cost:**	**Total Cost**	**HSIP Eligible:**	**HSIP:**	**State Match:**	**Other Amt:**	**TOTAL COST**
							100.00%	0.00%	0.00%	
Planning & Design:	Design PS&E	LS	1	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ -	$ -	$ 100,000.00
Environmental Clearance		LS	1	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ -	$ -	$ 10,000.00
Utility Relocation and Clearance		LS	1	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ -	$ -	$ 20,000.00
Non-Infastructure (NI) Elements:			0	$ -		$ -	$ -	$ -	$ -	$ -
ADOT Admin Costs:		LS	1	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ 30,000.00	$ -	$ -	$ 30,000.00
Design Sub-Total					**$ 160,000.00**	**$ 160,000.00**	**$ 160,000.00**	**$ -**	**$ -**	**$ 160,000.00**
Inflation Factor			**5.00%**		$ 8,000.00	$ 8,000.00	$ 8,000.00	$ -	$ -	$ 8,000.00
Total Design Cost					**$ 168,000.00**	**$ 168,000.00**	**$ 168,000.00**	**$ -**	**$ -**	**$ 168,000.00**
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	2.00	$200.00	$400.00	$400.00	$400.00			
6080005	WARNING, MARKER, OR REGULATORY SIGN PANEL	SQ.FT.	20.00	$22.00	$440.00	$440.00	$440.00			
7040005	PAVEMENT MARKING (WHITE EXTRUDED THERMOPLASTIC) (0.090")	L.FT.	250.00	$1.00	$250.00	$250.00	$250.00			
7040006	PAVEMENT MARKING (YELLOW EXTRUDED THERMOPLASTIC) (0.090")	L.FT.	250.00	$1.00	$250.00	$250.00	$250.00			
7040072	PAVEMENT MARKING (TRANSVERSE) (THERMOPLASTIC) (ALKYD) (0.090")	L.FT.	250.00	$1.50	$375.00	$375.00	$375.00			
7310371	POLE FOUNDATION (TYPE Q116, GLENDALE)	EACH	2.00	$2,500.00	$5,000.00	$5,000.00	$5,000.00			
7310580	MAST ARM (35 FT.) (TAPERED)	EACH	2.00	$2,500.00	$5,000.00	$5,000.00	$5,000.00			
	LUMINAIRE MAST ARM	EACH	2.00	$2,500.00	$5,000.00	$5,000.00	$5,000.00			
7320070	ELECTRICAL CONDUIT (3") (PVC)	L.FT.	100.00	$22.00	$2,200.00	$2,200.00	$2,200.00			
7320274	ELECTRICAL CONDUIT (2-3") (PVC) (DIRECTIONAL DRILL)	L.FT.	300.00	$50.00	$15,000.00	$15,000.00	$15,000.00			
7320421	PULL BOX (NO. 7) (WITH EXTENSION)	EACH	3.00	$750.00	$2,250.00	$2,250.00	$2,250.00			
7320650	CONDUCTORS	L.SUM	1.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00			
7330031	TRAFFIC SIGNAL FACE (TYPE T)	EACH	6.00	$700.00	$4,200.00	$4,200.00	$4,200.00			
7330210	TRAFFIC SIGNAL FACE (PEDESTRIAN) (MAN/HAND)	EACH	0.00	$467.86	$0.00	$0.00	$0.00			
7330212	PEDESTRIAN SIGNAL (COMPLETE COUNTDOWN)	EACH	4.00	$500.00	$2,000.00	$2,000.00	$2,000.00			
7330310	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE II)	EACH	0.00	$150.00	$0.00	$0.00	$0.00			
7330340	TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE V)	EACH	4.00	$450.00	$1,800.00	$1,800.00	$1,800.00			
73304001	TRAFFIC SIGNAL MOUNTING ASSEMBLY (VERTICAL SIGNAL HANGER, COG T8-4)	EACH	2.00	$350.00	$700.00	$700.00	$700.00			
7340103	CONTROL CABINET (CITY OF GLENDALE)	EACH	1.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00			
7340120	METER PEDESTAL CABINET	EACH	1.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00			
7350060	PEDESTRIAN PUSH BUTTON	EACH	2.00	$1,200.00	$2,400.00	$2,400.00	$2,400.00			
7350060	LUMINAIRE (HORIZONTAL MOUNT) (113 WATT)	EACH	2.00	$700.00	$1,400.00	$1,400.00	$1,400.00			
7360160	POWER SUPPLY (BATTERY BACKUP)	EACH	1.00	$6,500.00	$6,500.00	$6,500.00	$6,500.00			
7370455	MISCELLANEOUS ELECTRICAL (CCTV CAMERA W/CABLE AND MOUNT ASSEMBLY, ITS CONNECTION)	L.SUM	1.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00			
9080296	CONCRETE SIDEWALK RAMP	EACH	2.00	$3,000.00	$6,000.00	$6,000.00	$6,000.00			
9240015	FORCE ACCOUNT WORK (PROVIDE ELECTRICAL SERVICE)	L.SUM	1.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00			
9240095	MISCELLANEOUS WORK (LANDSCAPE MODIFICATIONS)	L.SUM	1.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00			
9240119	MISCELLANEOUS WORK (DETECTABLE WARNING STRIP)	EACH	2.00	$200.00	$400.00	$400.00	$400.00			
9010001	MOBILIZATION	L.SUM	1.00	$25,600.00	$25,600.00	$25,600.00	$25,600.00			
9250001	CONSTRUCTION SURVEYING AND LAYOUT	L.SUM	1.00	$1,600.00	$1,600.00	$1,600.00	$1,600.00			
7010001	TRAFFIC CONTROL	L.SUM	1.00	$15,500.00	$15,500.00	$15,500.00	$15,500.00			
Sub-Total			0		$170,265.00	$170,265.00	$170,265.00	$0.00	$0.00	$0.00
Sales Tax:	(if applicable)		**0.00%**	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sub-Total					**$ 170,265.00**	**$ 170,265.00**	**$ 170,265.00**	**$ -**	**$ -**	**$ -**
Construction Admin :			**14.00%**		$ 23,837.10	$ 23,837.10	$ 23,837.10	$ -	$ -	$ 23,837.10
Contingencies :			**5.00%**		$ 8,513.25	$ 8,513.25	$ 8,513.25	$ -	$ -	$ 8,513.25
Post Design:			**1.00%**		$ 1,702.65	$ 1,702.65	$ 1,702.65	$ -	$ -	$ 1,702.65
Communications:			**5.00%**		$ 8,513.25	$ 8,513.25	$ 8,513.25	$ -	$ -	$ 8,513.25
Post Sub-Total					**$ 42,566.25**	**$ 42,566.25**	**$ 42,566.25**	**$ -**	**$ -**	**$ 42,566.25**
Construction Sub-Total					**$ 212,831.25**	**$ 212,831.25**	**$ 212,831.25**	**$ -**	**$ -**	**$ 212,831.25**
Inflation Factor			**5.00%**		$ 10,641.56	$ 10,641.56	$ 10,641.56	$ -	$ -	$ 10,641.56
Construction Total					**$ 223,472.81**	**$ 223,472.81**	**$ 223,472.81**	**$ -**	**$ -**	**$ 223,472.81**
TOTAL REQUEST					**$ 391,472.81**	**$ 391,472.81**	**$ 391,472.81**	**$ -**	**$ -**	**$ 391,472.81**

Comments:

Required for all HSIP Applications

Agency:	City of Glendale	Title of Project:	Installation of Pedestrian Hybrid Becon (HAWK) at 67th Ave at Montebello Ave

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated **CRF*** Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	**0.20**	**57%**	0.11	$9,515,371	$1,080,946
Incapacitating Injury	**0.00**	**0%**	0.00	$550,499	$0
				Total Annual Benefits	$1,080,946

Costs

Total Project Cost	$391,473
Project Life (years)	10
Interest Rate (%)	8%
Capital Recovery Factor	0.1490
Annual Construction Cost	$58,341
Annual Maintenance Cost	$0.00
Total Annual Costs	$58,340.99

Benefit / Cost

Annual Benefit	Annual cost	Benefit / Cost Ratio
$1,080,946	$58,341	18.5

***REQUIRED: Use 4 and 5 star CMFs from ADOT Lists Only at Tabs 11 - 12 preferred. The CMF's CRF is used in the above calculation**

Incident ID	Incident Date & Time	Incident On Road	Incident Crossing Feature	Incident Offset	Incident Injury Severity Description	Incident First Harmful Description	Incident Collision Manner Desc	Incident Light Condition Desc	Incident Weather Desc	Incident Intersection Type Desc	Incident Junction Relation Desc	Incident Traffic Way Type Desc
307062	3/20/2016 8:30:00 PM	07 67TH AVE	Montebello Ave	0	Fatal	Pedestrian	Pedestrian	Dark Lighted	Clear	T_INTESECTION	Intersection Non Interchange	Two Way Not Divided With Continuous Left Turn Lane

N

Figure 1: Glendale, Arizona

Figure 2: 67th Avenue and Montebello Avenue

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 9021

Install pedestrian hybrid beacon (PHB or HAWK) with advanced yield or stop markings and signs

Description: Install a combination of a pedestrian hybrid beacon (PHB) and advanced yield or stop markings and signs

Prior Condition: No PHB or advanced yield or stop markings and signs

Category: Pedestrians

Study: *Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments*, Zegeer et al., 2017

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

Crash Modification Factor (CMF)

Value:	0.432
Adjusted Standard Error:	
Unadjusted Standard Error:	0.134

Crash Reduction Factor (CRF)

Value:	56.8 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	13.4

Applicability

Crash Type:	Vehicle/pedestrian
Crash Severity:	All
Roadway Types:	Minor Arterial
Number of Lanes:	2 to 8
Road Division Type:	

Speed Limit:	
Area Type:	Urban and suburban
Traffic Volume:	Minimum of 6634 to Maximum of 48791 Annual Average Daily Traffic (AADT)
Average Traffic Volume:	20673 Annual Average Daily Traffic (AADT)
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details

Date Range of Data Used:	2004 to 2013
Municipality:	
State:	AZ, FL, IL, MA, NY, NC, OR, VA, WI
Country:	USA
Type of Methodology Used:	Other before/after
Sample Size (crashes):	10 crashes before, 4 crashes after
Sample Size (sites):	27 sites before, 27 sites after

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov-17-2017
Comments:	Methodology used was a combination of EB before-after and cross-sectional estimations. Also, study sites were a combination of intersection and mid-block locations.

View the Full Study Details

Export Detail Page As A PDF

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

Exhibit 640-A. PEDESTRIAN HYBRID BEACON (PHB) EVALUATION

PEDESTRIAN HYBRID BEACON (PHB) EVALUATION

Location: 67th Ave and Montebello Ave, Glendale, AZ Date: 5/6/2019

1.	Motor vehicle crashes correctable by installation of PHB – Award 5 points for each crash (for the most recent 5 years of data) involving pedestrians, bicyclists, wheel chairs, skateboards, motorized scooters, or golf carts crossing within 500 feet on either side of the proposed PHB locations, or half the distance to the nearest signal (whichever is less):	5
2.	Peak hour pedestrian crossing volume – Award points if the average peak hour pedestrian crossing volume within 500 feet on either side of the proposed PHB location, or half the distance to the nearest traffic signal (whichever is less): 0 points ➔ 0 – 10 pedestrians per peak hour (average) 2 points ➔ 11 – 20 pedestrians per peak hour (average) 4 points ➔ 21 – 39 pedestrians per peak hour (average) 6 points ➔ 40^{+} pedestrians per peak hour (average)	4
3.	Location of nearest existing traffic signal or existing PHB – Award points: - 5 points ➔ Less than 500 feet 0 points ➔ 500 – 1,000 feet 5 points ➔ Over 1,000 feet	5
4.	Posted speed limit – Award points: 0 points ➔ Under 30 mph 2 points ➔ 30 – 35 mph 4 points ➔ 40 – 45 mph	4
5.	Roadway traffic volume (AADT) – Award points: 0 points ➔ Less than 5,000 2 points ➔ 5,000 – 9,999 4 points ➔ 10,000 – 14,999 6 points ➔ $15{,}000^{+}$	6
6.	Raised median – Award 5 points if the roadway does not have a raised median with a minimum width of 6 feet.	5
7.	Shared-use path or walkway – Award 5 points if a designated, maintained, and permitted shared-use path or walkway crosses the road at the proposed PHB location.	0
8.	Pedestrian activity generator – Award 5 points if the proposed PHB location is within 500 feet of a senior center, medical facility, community center, school, or other pedestrian activity generator.	5
9.	Roadway illumination – Award 5 points if the proposed PHB location does not have roadway illumination.	0
10.	Crossing distance – Award 5 points if the crossing distance is greater than 36 feet. (If a raised median with a minimum width of 6 feet is present, the crossing distance is measured to the median).	5
	GRAND TOTAL	39

640 PEDESTRIAN HYBRID BEACON

A pedestrian hybrid beacon (PHB) is a special type of hybrid beacon used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk.

If used, PHBs shall be used in conjunction with signs and pavement markings to warn and control traffic at locations where pedestrians enter or cross a street or highway. A PHB shall only be installed at a marked crosswalk.

The design and operation of pedestrian hybrid beacons should follow the guidelines set forth in the MUTCD.

PHB Evaluation Guidelines

To improve pedestrian crossings there are many possible treatments. These treatments include, but are not limited to, marked crosswalks, high visibility crosswalks, two-stage crosswalks, median refuges, street lighting, in-pavement lights, rectangular rapid flash beacons, PHBs, and pedestrian signals. A comprehensive evaluation of pedestrian crossing safety should be conducted in order to identify the most effective treatment.

PHBs should not be installed on roadways with speed limits greater than 45 mph.

The evaluation form shown in Exhibit 640-A should be used in determining whether or not a Pedestrian Hybrid Beacon should be utilized. A minimum score of 35 points merits Pedestrian Hybrid beacon consideration.

Additional factors that should be considered when a crossing merits PHB consideration:

- Is the location within a coordinated signal network?
- Does the roadway environment support the installation of the PHB? Does the street have adjoining sidewalks and/or pathways that will result in a logical utilization of the PHB?
- Is right-of-way needed?
- Are there utility conflicts?
- Is there significant potential for environmental or cultural issues?
- Is funding of the PHB available?
- Is 120/240 single phase power available at a reasonable cost?
- Does the local jurisdiction support the installation of a PHB? Is the local jurisdiction willing to pay for the power for the PHB? Is the local jurisdiction willing and capable of accepting the maintenance and operation of the PHB? Will the local jurisdiction pay for the power in order to light the crosswalk?

Exhibit 640-A. PEDESTRIAN HYBRID BEACON (PHB) EVALUATION

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6.	Raised median – Award 5 points if the roadway does not have a raised median with a minimum width of 6 feet.	5
7.	Shared-use path or walkway – Award 5 points if a designated, maintained, and permitted shared-use path or walkway crosses the road at the proposed PHB location.	0
8.	Pedestrian activity generator – Award 5 points if the proposed PHB location is within 500 feet of a senior center, medical facility, community center, school, or other pedestrian activity generator.	5
9.	Roadway illumination – Award 5 points if the proposed PHB location does not have roadway illumination.	0
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	GRAND TOTAL	39

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- Does the local jurisdiction support the installation of a PHB? Is the local jurisdiction willing to pay for the power for the PHB? Is the local jurisdiction willing and capable of accepting the maintenance and operation of the PHB? Will the local jurisdiction pay for the power in order to light the crosswalk?

67th Avenue & Montebello

	67th Avenue			Montebello	Montebello	
Time	North Crosswalk	South Crosswalk	Total Ped-Xing 67th Avenue	West Crosswalk	East Crosswalk	Hourly Total
0:00	0	2	2	0	0	2
1:00	0	0	0	0	3	3
2:00	0	2	2	0	0	2
3:00	1	0	1	0	0	1
4:00	0	0	0	0	0	0
5:00	0	1	1	0	0	1
6:00	1	6	7	0	2	9
7:00	1	3	4	0	5	9
8:00	5	3	8	0	2	10
9:00	8	1	9	0	2	11
10:00	11	3	14	0	2	16
11:00	**9**	**2**	11	**0**	**4**	15
12:00	15	5	20	0	4	24
13:00	9	2	11	0	7	18
14:00	9	6	15	0	3	18
15:00	8	3	11	0	8	19
16:00	**13**	**11**	24	**0**	**3**	27
17:00	7	9	16	0	15	31
18:00	9	3	12	0	0	12
19:00	9	8	17	0	12	29
20:00	11	9	20	0	4	24
21:00	10	5	15	0	5	20
22:00	6	2	8	0	7	15
23:00	1	1	2	0	1	3
Total	**143**	**87**		**0**	**89**	

HAWK Warrant Analysis

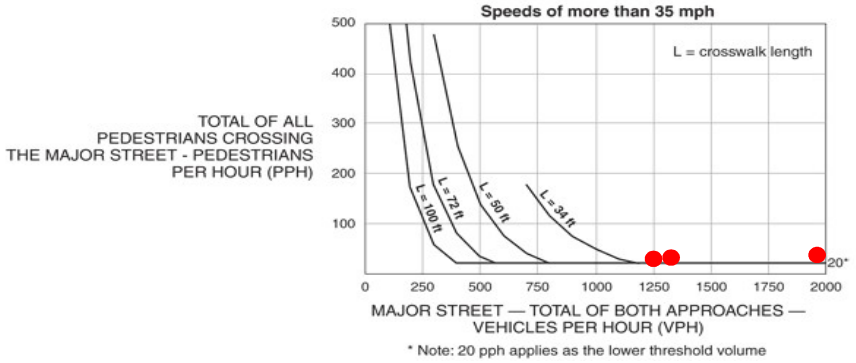
Traffic volumes with >20 Pedestrains crossing main street

Time	Main Street Traffic Volumes	Pedestrain Crossing 67th Avenue
16:00	2040	24
12:00	1275	20
20:00	1250	20

Pedestrain X-ing Distance: 77 ft

MUTCD HAWK Warrant Requirements

Figure 4F-2. Guidelines for the Installation of Pedestrian Hybrid Beacons on High-Speed Roadways



* Note: 20 pph applies as the lower threshold volume