



**PINAL COUNTY**  
WIDE OPEN OPPORTUNITY

May 23, 2018

Ms. Mona Aglan-Swick, P.E.  
Transportation Systems Management & Operations, Traffic Safety Section  
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: MAG**  
**Agency: Pinal County Public Works**  
**Project Name: Hunt Highway**  
**Project Location: Hunt Highway from Gary Road to Bella Vista Road**

Dear Ms. Aglan-Swick:

The Pinal County Public Works Department is submitting herewith a project application for state 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 installation of flashing yellow arrow signals at Gary Road, Walmart East Driveway, and Bella Vista Road; median modifications to improve negative offset left-turn lanes at Gary Road, and Walmart East and West Driveways; and sidewalk installation on west side from Tumbleweed Drive to 450 feet north of Tumbleweed Drive and does not include any non-infrastructure request. These improvements will directly address the predominant crash issues experienced in this corridor, namely left-turn crashes and a fatal pedestrian crash. It is anticipated that this work will be performed by a specialty contractor. Ground disturbing activities will be required; no utility relocations are anticipated.

From 2012 through 2016, two fatal crashes and eighteen incapacitating injury crashes were reported within the proposed project area. With a combined Crash Reduction Factor (CRF) of 65% for fatal crashes and 45% for incapacitating injury crashes obtained from the Crash Modification Factors Clearinghouse, this corridor could see a 5-year reduction of 1.3 fatal crashes and 8.1 serious injury crashes.

Pinal County has determined that, in accordance with 23 USC 148(a)(4)(A), this project is consistent with the MAG and State's 2014 SHSP and supports the Intersection and Pedestrians Emphasis Areas.  
BC Ratio = 22.3

**Public Works Department**

31 N. Pinal Street, Building F., PO Box 727 Florence, AZ 85132  
T 520-509-3555 Hours: M-F 8:00 am – 5:00 pm F 520-866-6511

[www.pinalcountyaz.gov](http://www.pinalcountyaz.gov)



## PINAL COUNTY

WIDE OPEN OPPORTUNITY

Pinal County has estimated the total project cost of this project to be \$760,969, and is requesting \$745,935 in HSIP funds, with a local match of \$15,034. In accordance with Title 23, the federal share of some of the improvements in this project is 100% per 23 U.S.C. 120(c) as described in Code of Federal Register 23 CFR Part 924. Pinal County proposes to contribute a \$15,034 local match for this project.

Pinal County 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 Pinal County to cover the additional costs or the project will have to be withdrawn and resubmitted in the next call-for-projects.

Pinal County 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.

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

If you have any questions, please contact me at 520-866-6345 or email at [scott.bender@pinalcountyyaz.gov](mailto:scott.bender@pinalcountyyaz.gov).

Sincerely,

Scott Bender, PE  
Pinal County Public Works  
31 N. Pinal Street  
Florence, AZ 85132

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

<b>Agency:</b>	<b>Pinal County Public Works</b>	<b>Title of Project:</b>	<b>Hunt Highway, Gary Rd to Bella Vista Rd</b>
<b>County:</b>	<b>Pinal County</b>	<b>COG/MPO:</b>	<b>MAG</b>
<b>District:</b>	<b>Central</b>	<b>Date:</b>	<b>23-May-18</b>
<b>Contact:</b>		<b>Phone:</b>	<b>E-Mail:</b>
Scott Bender		520-866-6345	<a href="mailto:scott.bender@pinalcountyz.gov">scott.bender@pinalcountyz.gov</a>
<b>Type of Safety Improvement:</b>	<b>Spot:</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<b>Systemic:</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<b>Mark all that apply to your project:</b> <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Const. <input type="checkbox"/> Procurement <input type="checkbox"/> Non-Infrastructure			
<b>Anticipated Total Cost Estimate:</b>	<b>\$760,969.00</b>		
<b>Anticipated dollar amount of HSIP Funding:</b>	<b>\$745,935.00</b>		
<b>Anticipated Dollar amount of Local Match (5.7%) (5.66%):</b>	<b>\$15,034.00</b>		
<b>Anticipated Dollar amount of Other:</b>	<b>\$0.00</b>		
<b>Funding Source:</b> <input checked="" type="checkbox"/> 100% HSIP <input type="checkbox"/> 94.3% HSIP <input type="checkbox"/> 94.34% HSIP	<b>Cost Estimate Tab:</b> 8. 94.3% Spot Improvement		
<b>Administration of Project:</b>	<b>Agency:</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>ADOT:</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
<b>Name and Title of COG/MPO Representative:</b>		Margaret Boone	
<b>Basic Project Information</b>			
<b>Anticipated Design Year (Construction year cannot be the same):</b>		<input checked="" type="checkbox"/> FY21	
<b>If additional ROW is needed, what FY is purchase anticipated?:</b>		<input type="checkbox"/> FY21 <input type="checkbox"/> FY22	
<b>Anticipated Construction Year:</b>		<input type="checkbox"/> FY21* <input checked="" type="checkbox"/> FY22	
<b>1.</b>	<b>Have lower cost countermeasures been considered or implemented?</b>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>1a.</b>	<b>If "Yes", describe: If "No", explain why not:</b>	<b>Widening of Hunt Highway</b>	
<b>2.</b>	<b>Which 23 USC 148 highway safety improvement project category does this project come under?</b>		
<b>2a.</b>	<b>1. Intersection safety improvement</b>		
<b>3.</b>	<b>Describe your safety improvement project in detail: (50 words or less)</b>		
<b>3a.</b>	On Hunt Highway: Installation of flashing yellow arrow signals at Gary Road, Wal Mart East Driveway, and Bella Vista Road; median modifications to improve negative offset left-turn lanes at Gary Road, and Wal Mart East and West Driveways; sidewalk installation on west side from Tumbleweed Drive to 450 feet north of Tumbleweed Drive.		
<b>4.</b>	<b>Describe the location of this safety project:</b>		

<b>Agency:</b>	<b>Pinal County Public Works</b>	<b>Title of Project:</b>	<b>Hunt Highway, Gary Rd to Bella Vista Rd</b>
<b>County:</b>	<b>Pinal County</b>	<b>COG/MPO:</b>	<b>MAG</b>
<b>District:</b>	<b>Central</b>	<b>Date:</b>	<b>23-May-18</b>
<b>4a.</b>	Hunt Highway from Gary Road to Bella Vista Road.		
<b>5.</b>	<b>What crash data screening method was used to identify this project?</b>		
<b>5a.</b>	Network screening of most recent five years of crash data ending December 31, 2016 as part of the development of the Pinal County STSP.		
<b>6.</b>	<b>What is the safety justification for the proposed project?</b>		
<b>6a.</b>	To address intersection and pedestrian crashes.		
<b>7.</b>	<b>Will there be ground disturbing activities?</b>	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>8.</b>	<b>Is project within applicants permanent ROW?</b>	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>8a.</b>	<b>If NO please explain:</b>		
<b>9.</b>	<b>Will any temporary right-of-way acquisitions be required?</b>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
<b>10.</b>	<b>Will there be any utility relocation needed?</b>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
<b>10a.</b>	<b>If YES please explain:</b>		
<b>11.</b>	<b>Does Section 4(f) apply to any portion of this project?</b>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
<b>11a.</b>	<b>If YES please explain:</b>		
<b>12.</b>	<b>Are there any other issues that may impact or delay development or construction of this project?</b>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO

<b>Agency:</b>	<b>Pinal County Public Works</b>	<b>Title of Project:</b>	<b>Hunt Highway, Gary Rd to Bella Vista Rd</b>		
<b>County:</b>	<b>Pinal County</b>	<b>COG/MPO:</b>	<b>MAG</b>		
<b>District:</b>	<b>Central</b>	<b>Date:</b>	<b>23-May-18</b>		
<b>12a.</b>	If YES please explain:				
<b>13.</b>	Is this project in compliance with revised ADA Standards?			<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>13a.</b>	If NO please explain:				
<b>14.</b>	Does the project support Arizona's Strategic Highway Safety Plan?			<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>15.</b>	Are there any Studies, RSA's or Other evaluations that support this project?			<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
<b>16.</b>	HSIP Roadway Functional Classification:		Rural Minor Arterial		
<b>17.</b>	Average Daily Traffic Volume and Year Collected:		ADT: 30,800	Year: 2014	
<b>18.</b>	What is the source of ADT?:	Pinal County Count Program			
<b>19.</b>	What is the posted speed limit?	45			
<b>20.</b>	Detailed engineer's cost estimate attached:			<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>"Systemic" Safety Project</b>					
<b>21.</b>	Completed B/C Ratio Tabulation Sheet Attached (Required):			<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>22.</b>	Most current 5 Years Crash Data from ADOT ALISS database sorted by year & severity (required):			<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>23.</b>	What are the inclusive dates of the crash data?				
<b>24.</b>	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
<b>25.</b>	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	
<b>26.</b>	Does the project require proprietary Items (23CFR 635.411)?:			<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>27.</b>	Is a list of locations for systemic projects provided on the attached form?			<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>28.</b>	How are (will) the proposed locations be prioritized for replacement? (explain below)				
<b>28a.</b>					

<b>Agency:</b>	<b>Pinal County Public Works</b>	<b>Title of Project:</b>	<b>Hunt Highway, Gary Rd to Bella Vista Rd</b>
<b>County:</b>	<b>Pinal County</b>	<b>COG/MPO:</b>	<b>MAG</b>
<b>District:</b>	<b>Central</b>	<b>Date:</b>	<b>23-May-18</b>
<b>29.</b>	<b>Are the supporting structures in good condition, meet local standards and have an anticipated service life longer than the countermeasure being installed?</b>		<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>"Spot" Improvement Projects Only</b>			
<b>30.</b>	<b>Completed B/C Ratio Tabulation Sheet Attached (required):</b>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>31.</b>	<b>Is the most current 5 Years Crash Data from ADOT ALISS database sorted by year &amp; severity attached and in correct format? (required):</b>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>32.</b>	<b>What are the inclusive dates of the crash data?</b>	<b>2012-2016</b>	
	<b>Have all crashes that will not be influenced by this countermeasure been deleted from the crash list? (pedestrian, pedalcycle etc. as applicable)</b>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>33.</b>	<b>Have any infrastructure changes occurred within the work limits of this project during the years the crash data covers?</b>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>34.</b>	<b>If YES please explain:</b>	<b>Widening of Hunt Highway</b>	
<b>35.</b>	<b>Project vicinity map is provided:</b>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>36.</b>	<b>Project work limits map is provided:</b>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>SHSP - All Projects</b>			
<b>37.</b>	<b>Which SHSP Emphasis Area (EA) does this project support?:</b>	Roadway_Infrastructure_and_Operations	
<b>37a.</b>	<b>Which EA Strategy does it support?:</b>	(Intersections) Reduce frequency and severity of intersection crashes through traffic-control and operational improvement.	
<b>37b.</b>	<b>Does this project support a second SHSP EA? If so, which EA.:</b>	Roadway_Infrastructure_and_Operations	
<b>37c.</b>	<b>Which EA Strategy supports the second EA?</b>	(Intersections) Reduce frequency and severity of intersection crashes through geometric improvement	
<b>37d.</b>	<b>Does this project support a third SHSP EA? If so, which EA.:</b>	Nonmotorized_Users	

<b>Agency:</b>	<b>Pinal County Public Works</b>	<b>Title of Project:</b>	<b>Hunt Highway, Gary Rd to Bella Vista Rd</b>
<b>County:</b>	<b>Pinal County</b>	<b>COG/MPO:</b>	<b>MAG</b>
<b>District:</b>	<b>Central</b>	<b>Date:</b>	<b>23-May-18</b>
<b>37e.</b>	<b>Which EA Strategy supports the third EA?</b>	(Pedestrians) Reduce pedestrian exposure to vehicle traffic	
<b>38.</b>	<b>Does this project support one of the nine FHWA proven countermeasures?:</b>	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
<b>38a.</b>	<b>If so, which countermeasure?:</b>		
<b>39.</b>	<b>Does this project support one of the three Arizona Focus Areas?:</b>	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>39a.</b>	<b>If so, which focus area?:</b>	<b>Intersection</b>	
<b>40.</b>	<b>Which HSIP Improvement Category does this project support?:</b>	<b>Intersection_Traffic_Control</b>	
<b>40a.</b>	<b>Which HSIP Improvement Sub-Category does this project support?:</b>	Modify traffic signal – add flashing yellow arrow	
<b>41.</b>	<b>Does your COG/MPO have a Strategic Transportation Safety Plan (STSP)?:</b>	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>41a.</b>	<b>If "YES", does this project support an Emphasis Area in the COG/MPO STSP?:</b>	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
<b>41b.</b>	<b>List the EA:</b>	Intersections, Pedestrians	
<b>41c.</b>	<b>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)</b>		
<b>41d.</b>	<b>Rational</b>		
<b>42.</b>	<b>Are any temporary safety countermeasures needed prior to this permanent solution being installed?</b>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
<b>42a.</b>	<b>If yes, please explain:</b>		
<b>43.</b>	<b>For State Agencies, has the Regional Traffic Engineer been made aware of this potential project and does he/she concur with it?</b>	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>B/C Ratio</b>			
<b>44.</b>	<b>The calculated B/C Ratio is:</b>	<b>22.30</b>	

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

<b>Agency:</b>	Pinal County Public Works		<b>Name of Project:</b>	Hunt Highway	Spot Improvement				
<b>HSIP Project Cost Estimate Worksheet</b>									
Project Cost Estimate:	Description:	Unit	Quantity:	Unit Cost:	Total Cost:	HSIP:	Local Match:	Other Amt:	TOTAL COST
						94.30%	5.70%	0.00%	
Scoping			1	\$20,000.00	\$20,000.00	\$ 19,604.87	\$ 395.13	\$ -	\$ 20,000.00
Design			1	\$140,000.00	\$140,000.00	\$ 137,234.09	\$ 2,765.91	\$ -	\$ 140,000.00
Environmental Clearance			1	\$20,000.00	\$20,000.00	\$ 19,604.87	\$ 395.13	\$ -	\$ 20,000.00
ADOT Admin Costs:			1	\$ 30,000.00	\$ 30,000.00	\$ 29,407.30	\$ 592.70	\$ -	\$ 30,000.00
<b>Design Sub-Total</b>					<b>\$ 210,000.00</b>	<b>\$ 205,851.13</b>	<b>\$ 4,148.87</b>	<b>\$ -</b>	<b>\$ 210,000.00</b>
Construction:	Intall Flashing Yellow Arrow Signals at Gary Rd, Wal Mart East Driveway, Bella Vista Dr	EA	3	\$ 80,000.00	\$ 240,000.00	\$ 240,000.00	No Match Required	\$ -	\$ 240,000.00
Construction:	Median modifications to improve left-turn negative offset at Gary Rd, Wal Mart East and West Driveways	EA	6	\$ 20,000.00	\$ 120,000.00	\$ 113,160.00	\$ 6,840.00		\$ 120,000.00
Construction:	Install sidewalk west side of Hunt Highway in Tumbleweed Drive area	Sq Ft	2250	\$ 3.25	\$ 7,312.50	\$ 6,895.69	\$ 416.81		\$ 7,312.50
<b>HSIP Eligible Sub-Total</b>			<b>0</b>		<b>\$ 367,312.50</b>	<b>\$ 360,055.69</b>	<b>\$ 7,256.81</b>	<b>\$ -</b>	<b>\$ 367,312.50</b>
					\$ -			\$ -	\$ -
<b>Non-HSIP Eligible Sub-Total</b>					<b>\$ -</b>			<b>\$ -</b>	<b>\$ -</b>
<b>Construction Sub-Total</b>					<b>\$ 367,312.50</b>	<b>\$ 360,055.69</b>	<b>\$ 7,256.81</b>	<b>\$ -</b>	<b>\$ 367,312.50</b>
Traffic Control:			<b>10.00%</b>		\$ 36,731.25	\$ 36,005.57	\$ 725.68	\$ -	\$ 36,731.25
Mobilization:			<b>10.00%</b>		\$ 36,731.25	\$ 36,005.57	\$ 725.68	\$ -	\$ 36,731.25
<b>Construction Sub-Total</b>					<b>\$ 440,775.00</b>	<b>\$ 432,066.83</b>	<b>\$ 8,708.17</b>	<b>\$ -</b>	<b>\$ 440,775.00</b>
Construction Admin :			<b>14.00%</b>		\$ 61,708.50	\$ 60,489.36	\$ 1,219.14	\$ -	\$ 61,708.50
Contingencies :			<b>5.00%</b>		\$ 22,038.75	\$ 21,603.35	\$ 435.40	\$ -	\$ 22,038.75
Post Design:			<b>1.00%</b>		\$ 4,407.75	\$ 4,320.67	\$ 87.08	\$ -	\$ 4,407.75
Communications:			<b>5.00%</b>		\$ 22,038.75	\$ 21,603.35	\$ 435.40	\$ -	\$ 22,038.75
					\$ -	\$ -	\$ -	\$ -	\$ -
<b>Post Sub-Total</b>					<b>\$ 110,193.75</b>	<b>\$ 108,016.73</b>	<b>\$ 2,177.02</b>	<b>\$ -</b>	<b>\$ 110,193.75</b>
<b>Post Const Sub-Total</b>					<b>\$ 550,968.75</b>	<b>\$ 540,083.56</b>	<b>\$ 10,885.19</b>	<b>\$ -</b>	<b>\$ 550,968.75</b>
<b>TOTAL REQUEST</b>					<b>\$ 760,968.75</b>	<b>\$ 745,934.69</b>	<b>\$ 15,034.06</b>	<b>\$ -</b>	<b>\$ 760,968.75</b>

Comments:

**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.40</b>	<b>65%</b>	0.26	\$5,800,000	\$1,508,000
Incapacitating Injury	<b>3.60</b>	<b>45%</b>	1.62	\$400,000	\$648,000
Total Annual Benefits					\$2,156,000

**Costs**

Total Project Cost	\$760,969	
Project Life (years)	13	
Interest Rate (%)	8%	
Capital Recovery Factor	0.1265	
Annual Construction Cost	\$96,279	
Annual Maintenance Cost	\$300	
Total Annual Costs		\$96,579

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$2,156,000	\$96,579	22.3

**\*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 ID 4177 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 19% CRF Left-turn Crashes, All Severities. CMF ID 4176 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 8% CRF All Crashes, All Severities. CMF ID 6097 Improve Left-Turn Lane Offset to Create Positive Offset: 38% CRF Left-Turn Crashes, All Severities. CMF ID 6096 Improve Left-Turn Lane Offset to Create Positive Offset: 36% CRF All Crashes, Severity K, A, B, C. CMF ID 1335 Install Sidewalk: 89% CRF for pedestrian crashes, all severities.

**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway West Sidewalk Installation, Tumbleweed Dr to 450 feet north
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.20</b>	<b>89%</b>	0.18	\$5,800,000	\$1,032,400
Incapacitating Injury	<b>0.00</b>		0.00	\$400,000	\$0
Total Annual Benefits					\$1,032,400

**Costs**

Total Project Cost	\$66,000
Project Life (years)	20
Interest Rate (%)	8%
Capital Recovery Factor	0.1019
Annual Construction Cost	\$6,722
Annual Maintenance Cost	\$300
Total Annual Costs	\$7,022

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$1,032,400	\$7,022	147.0

**\*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**

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**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway Negative Offset Improvement WalMart West Driveway
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.00</b>		0.00	\$5,800,000	\$0
Incapacitating Injury	<b>0.60</b>	<b>38%</b>	0.23	\$400,000	\$91,200
Total Annual Benefits					\$91,200

**Costs**

Total Project Cost	\$115,000
Project Life (years)	20
Interest Rate (%)	8%
Capital Recovery Factor	0.1019
Annual Construction Cost	\$11,713
Annual Maintenance Cost	\$300
Total Annual Costs	\$12,013

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$91,200	\$12,013	7.5

**\*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 ID 6097 Improve Left-Turn Lane Offset to Create Positive Offset: 38% CRF Left-Turn Crashes, All Severities. CMF ID 6096 Improve Left-Turn Lane Offset to Create Positive Offset: 36% CRF All Crashes, Severity K, A, B, C.

**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway Negative Offset Improvement WalMart East Driveway
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.20</b>	<b>36%</b>	0.07	\$5,800,000	\$417,600
Incapacitating Injury	<b>0.20</b>	<b>36%</b>	0.07	\$400,000	\$28,800
Total Annual Benefits					\$446,400

**Costs**

Total Project Cost	\$115,000
Project Life (years)	20
Interest Rate (%)	8%
Capital Recovery Factor	0.1019
Annual Construction Cost	\$11,713
Annual Maintenance Cost	\$300
Total Annual Costs	\$12,013

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$446,400	\$12,013	37.1

**\*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 ID 6097 Improve Left-Turn Lane Offset to Create Positive Offset: 38% CRF Left-Turn Crashes, All Severities. CMF ID 6096 Improve Left-Turn Lane Offset to Create Positive Offset: 36% CRF All Crashes, Severity K, A, B, C.

**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway Negative Offset Improvement Gary Rd
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.00</b>		0.00	\$5,800,000	\$0
Incapacitating Injury	<b>1.00</b>	<b>37%</b>	0.37	\$400,000	\$148,000
Total Annual Benefits					\$148,000

**Costs**

Total Project Cost	\$115,000
Project Life (years)	20
Interest Rate (%)	8%
Capital Recovery Factor	0.1019
Annual Construction Cost	\$11,713
Annual Maintenance Cost	\$300
Total Annual Costs	\$12,013

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$148,000	\$12,013	12.3

**\*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 ID 6097 Improve Left-Turn Lane Offset to Create Positive Offset: 38% CRF Left-Turn Crashes, All Severities. CMF ID 6096 Improve Left-Turn Lane Offset to Create Positive Offset: 36% CRF All Crashes, Severity K, A, B, C.

**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway Flashing Yellow Arrow at WalMart East Driveway
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.20</b>	<b>8%</b>	0.02	\$5,800,000	\$92,800
Incapacitating Injury	<b>0.20</b>	<b>8%</b>	0.02	\$400,000	\$6,400
Total Annual Benefits					\$99,200

**Costs**

Total Project Cost	\$180,000
Project Life (years)	10
Interest Rate (%)	8%
Capital Recovery Factor	0.1490
Annual Construction Cost	\$26,825
Annual Maintenance Cost	\$300
Total Annual Costs	\$27,125

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$99,200	\$27,125	3.6

**\*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 ID 4177 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 19% CRF Left-turn Crashes, All Severities. CMF ID 4176 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 8% CRF All Crashes, All Severities.

**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway Flashing Yellow Arrow at Gary Rd
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.00</b>		0.00	\$5,800,000	\$0
Incapacitating Injury	<b>1.00</b>	<b>12%</b>	0.12	\$400,000	\$48,000
Total Annual Benefits					\$48,000

**Costs**

Total Project Cost	\$180,000
Project Life (years)	10
Interest Rate (%)	8%
Capital Recovery Factor	0.1490
Annual Construction Cost	\$26,825
Annual Maintenance Cost	\$300
Total Annual Costs	\$27,125

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$48,000	\$27,125	1.7

**\*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 ID 4177 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 19% CRF Left-turn Crashes, All Severities. CMF ID 4176 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 8% CRF All Crashes, All Severities.

**Required for all HSIP Applications**

<b>Agency:</b>	Pinal County	<b>Title of Project:</b>	Hunt Highway Flashing Yellow Arrow at Bella Vista Dr
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**Benefit / Cost Ratio Tabulation**

**Annual Benefit Tabulation**

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	<b>0.00</b>		0.00	\$5,800,000	\$0
Incapacitating Injury	<b>1.80</b>	<b>14%</b>	0.25	\$400,000	\$100,800
Total Annual Benefits					\$100,800

**Costs**

Total Project Cost	\$180,000
Project Life (years)	10
Interest Rate (%)	8%
Capital Recovery Factor	0.1490
Annual Construction Cost	\$26,825
Annual Maintenance Cost	\$300
Total Annual Costs	\$27,125

**Benefit / Cost**

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$100,800	\$27,125	3.7

**\*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 ID 4177 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 19% CRF Left-turn Crashes, All Severities. CMF ID 4176 Change Left-Turn Phasing from Protected/Permissive to Flashing Yellow Arrow: 8% CRF All Crashes, All Severities.

Id	Date	Date	Time	Onroad	CrossingFeature	Offset	InjurySeverity	FirstHarmful	Collision Manner	LightCondition	Weather	IntersectionType	JunctionRelation Desc	TrafficWayType	UnitTravelDirectionDesc	UnitActionDesc	UnitRoadConditionDesc1	SurfaceCondition	EnvCondition	UnitDefect	UnitNumber	UnitEvent Sequence	UnitEvent Sequence	UnitEvent Sequence	UnitEvent Sequence	PersonSafety Device	PersonViolation	PersonPhysical	PersonPhysical
2971643	5/22/15 08:58:00 AM	5/22/2015	8:58:00 AM	Hunt Hwy	Stone Creek Dr	-0.145	Fatal	Motor Vehicle in Transport	Rear End	Dark Lighted	Clear	Not Reported	Driveway	Two Way Divided Positive Median Barrier	Southeast	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Speed Too Fast for Conditions	Alcohol	Drugs
2755964	8/25/13 07:23:00 AM	8/25/2013	7:23:00 AM	Hunt Hwy	Gary Rd	0.0047	Incapacitating Injury	Motor Vehicle in Transport	Rear End	Daylight	Clear	Four Way Intersection	Intersection Related NonInterchange	Unknown	West	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Inattention/Distraction	Alcohol	Drugs
2942562	3/12/15 05:49:00 AM	3/12/2015	5:49:00 AM	Hunt Hwy	Tumbling River Rd	-0.039	Fatal	Pedestrian	Other	Dark Not Lighted	Cloudy	Not Intersection Related	Not Junction Related	Two Way Divided Unprotected Painted 4 Feet Median	West	Walking Against Traffic	Other	Dry	Other	Unknown	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Non Applicable	Walked on Wrong Side of Road	Drugs	Test Given
2830001	3/29/14 03:17:00 AM	3/29/2014	3:17:00 AM	Hunt Hwy	Gary Rd	0	Incapacitating Injury	Motor Vehicle in Transport	Angle	Daylight	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Not Divided with Continuous Left Turn Lane	South	Going Straight Ahead	Unknown	Dry	Unknown	Unknown	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Unknown	Disregarded Traffic Signal	Alcohol	Testing Unknown
2872039	8/06/14 03:28:00 AM	8/6/2014	3:28:00 AM	Hunt Hwy	Gary Rd	0	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Daylight	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Divided Positive Median Barrier	East	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	None Used	Disregarded Traffic Signal	No Apparent Influence	No Apparent Influence
3054144	2/06/16 02:07:00 AM	2/6/2016	2:07:00 AM	Hunt Hwy	Gary Rd	0.1	Incapacitating Injury	Motor Vehicle in Transport	Angle	Daylight	Clear	Not Reported	Driveway	Two Way Not Divided	West	Going Straight Ahead	Unknown	Dry	Unknown	Unknown	1	Other Non Collision	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Disregarded Traffic Signal	No Apparent Influence	No Apparent Influence
2755966	8/14/13 04:50:00 AM	8/14/2013	4:50:00 AM	Golf Club Dr	Hunt Hwy	0	Incapacitating Injury	Motor Vehicle in Transport	Angle	Daylight	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Not Divided with Continuous Left Turn Lane	South	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Disregarded Traffic Signal	No Apparent Influence	No Apparent Influence
2683757	10/29/12 10:43:00 AM	10/29/2012	#####	Hunt Hwy	Golf Club Dr	0	Incapacitating Injury	Motor Vehicle in Transport	Rear to Side	Daylight	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Divided Unprotected Painted 4 Feet Median	East	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Disregarded Traffic Signal	No Apparent Influence	No Apparent Influence
3092976	5/16/16 05:44:00 AM	5/16/2016	5:44:00 AM	Hunt Hwy	Bella Vista Rd	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	East	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Air Bag Deployed/Shoulder-Lap Belt	Disregarded Traffic Signal	No Apparent Influence	No Apparent Influence
2688797	1/23/13 04:46:00 AM	1/23/2013	4:46:00 AM	Hunt Hwy	Golf Club Dr	0	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Daylight	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Divided Unprotected Painted 4 Feet Median	North	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Unknown	Disregarded Traffic Signal	No Apparent Influence	No Apparent Influence
3138289	9/09/16 08:07:00 AM	9/9/2016	8:07:00 AM	Bella Vista Rd	Hunt Hwy	0	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Dark Lighted	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Divided Unprotected Painted 4 Feet Median	Northeast	Making Left Turn	Unknown	Dry	Unknown	Unknown	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Unknown	Made Improper Turn	No Apparent Influence	No Apparent Influence
3005617	10/08/15 12:08:00 PM	10/8/2015	#####	Hunt Hwy	Stone Creek Dr	-0.081	Incapacitating Injury	Motor Vehicle in Transport	Rear End	Daylight	Clear	Unknown	Not Junction Related	Two Way Divided Positive Median Barrier	East	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Other	No Apparent Influence	No Apparent Influence
3166736	11/21/16 07:39:00 AM	11/21/2016	7:39:00 AM	Hunt Hwy	Bella Vista Rd	-0.019	Incapacitating Injury	Motor Vehicle in Transport	Angle	Dark Lighted	Clear	Not Intersection Related	Not Junction Related	Two Way Not Divided with Continuous Left Turn Lane	Northwest	Making Left Turn	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Failed to Yield Right of Way	No Apparent Influence	No Apparent Influence
2919576	1/12/15 06:37:00 AM	1/12/2015	6:37:00 AM	Hunt Hwy	Gary Rd	0.1295	Incapacitating Injury	Motor Vehicle in Transport	Angle	Dark Unknown Lighting	Cloudy	Not Intersection Related	Not Junction Related	Two Way Divided Positive Median Barrier	West	Making Left Turn	Unknown	Dry	Stopped Parked Vehicle	Unknown	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Shoulder and Lap Belt	Failed to Yield Right of Way	No Apparent Influence	No Apparent Influence
2833117	4/23/14 07:41:00 AM	4/23/2014	7:41:00 AM	Hunt Hwy	Bella Vista 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	North	Making Left Turn	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Air Bag Deployed/Shoulder-Lap Belt	Failed to Yield Right of Way	No Apparent Influence	No Apparent Influence
3033559	12/05/15 07:37:00 AM	12/5/2015	7:37:00 AM	Hunt Hwy	Bella Vista Rd	0	Incapacitating Injury	Motor Vehicle in Transport	Rear to Side	Dark Lighted	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Not Divided	East	Making Left Turn	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Unknown	Failed to Yield Right of Way	No Apparent Influence	No Apparent Influence
2890294	10/22/14 04:07:00 AM	10/22/2014	4:07:00 AM	Hunt Hwy	Gary Rd	0.1278	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Daylight	Clear	Not Intersection Related	Not Junction Related	Two Way Divided Positive Median Barrier	West	Making Left Turn	Unknown	Dry	Stopped Parked Vehicle	Unknown	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	No Contributing Circumstances	Unknown	Failed to Yield Right of Way	No Apparent Influence	No Apparent Influence

2893971	11/03/14 06:29:00 AM	11/3/2014	6:29:00 AM	Hunt Hwy	Gary Rd	0.1705	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Dark Unknown Lighting	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Divided Positive Median Barrier	West	Making Left Turn	Unknown	Dry	Stopped Parked Vehicle	Unknown	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	no Contributing Circumstances	Unknown	Failed to Yield Right of Way	No Apparent Influence	No Apparent Influence
3057841	2/23/16 03:41:00 AM	2/23/2016	3:41:00 AM	Hunt Hwy	Bella Vista Rd	-0.01	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Dark Lighted	Clear	Not Intersection Related	Not Junction Related	Two Way Not Divided	Northwest	Making Left Turn	Unknown	Dry	Unknown	Unknown	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	no Contributing Circumstances	Air Bag Deployed	Made Improper Turn	Unknown	No Apparent Influence
2720011	3/13/13 05:00:00 AM	3/13/2013	5:00:00 AM	Hunt Hwy	Gary Rd	0.0947	Incapacitating Injury	Motor Vehicle in Transport	Unknown	Daylight	Clear	Not Intersection Related	Not Junction Related	Two Way Not Divided with Continuous Left Turn Lane	West	Making Left Turn	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	No Contributing Circumstances	No Contributing Circumstances	no Contributing Circumstances	Shoulder and Lap Belt	Failed to Yield Right of Way	Unknown	No Apparent Influence

- a. Most recent 5 years of data from the ADOT crash database.
- b. Only crashes that the proposed countermeasure will correct
- c. Only crashes in the countermeasure's influence area
- d. Severity of each crash, Fatal and Serious injury only
- e. Manner of collision
- f. Driver behavior of U1. (Alcohol related or other driver behavior influenced crashes can be included in infrastructure countermeasure calculations).
- g. Other relevant attributes
- h. Do not include crashes unreported by law enforcement unless supporting documentation, i.e. crash reports, is provided and attested to.