



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: Gantzel Road
Project Location: Gantzel Road from Ocotillo Road to Combs 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 improvements of Gantzel Road, including installation of flashing yellow arrow signals at Ocotillo Road, Combs Road; median modifications to improve negative offset left-turn lanes at Ocotillo Road (all legs), Combs Road (east leg); sidewalk installation on west side from Chandler Heights Road to 250 feet south of Via De Arboles; and sidewalk installation on Combs Road from Gantzel Road to 250 feet west of Gantzel Road 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, three fatal crashes and five incapacitating injury crashes were reported within the proposed project area. With a combined Crash Reduction Factor (CRF) of 60% for fatal crashes and 47% for incapacitating injury crashes obtained from the Crash Modification Factors Clearinghouse, this corridor could see a 5-year reduction of 1.8 fatal crashes and 2.35 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 = 29.4

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



PINAL COUNTY

WIDE OPEN OPPORTUNITY

Pinal County has estimated the total project cost of this project to be \$633,615, and is requesting \$617,961 in HSIP funds, with a local match of \$15,654. 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 \$15,654 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@pinalcountyaz.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

Agency:	Pinal County Public Works	Title of Project:	Gantzel Road, Ocotillo Road to Combs Road
County:	Pinal County	COG/MPO:	MAG
District:	Central	Date:	23-May-18
Contact:		Phone:	E-Mail:
Scott Bender		520-866-6345	scott.bender@pinalcountyz.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 checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Const. <input type="checkbox"/> Procurement <input type="checkbox"/> Non-Infrastructure			
Anticipated Total Cost Estimate:		\$633,615.00	
Anticipated dollar amount of HSIP Funding:		\$617,961.00	
Anticipated Dollar amount of Local Match (5.7%) (5.66%):		\$15,654.00	
Anticipated Dollar amount of Other:			
Funding Source: <input checked="" type="checkbox"/> 100% HSIP <input type="checkbox"/> 94.3% HSIP <input type="checkbox"/> 94.34% HSIP	Cost Estimate Tab:		8. 94.3% Spot Improvement
Administration of Project:	Agency: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	ADOT: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
Name and Title of COG/MPO Representative:		Margaret Boone	
Basic Project Information			
Anticipated Design Year (Construction year cannot be the same):		<input checked="" type="checkbox"/> FY21	
If additional ROW is needed, what FY is purchase anticipated?:		<input type="checkbox"/> FY21 <input type="checkbox"/> FY22	
Anticipated Construction Year:		<input type="checkbox"/> FY21* <input checked="" type="checkbox"/> FY22	
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:	No safety studies completed	
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.	On Gantzel Road: Installation of flashing yellow arrow signals at Ocotillo Road, Combs Road; median modifications to improve negative offset left-turn lanes at Ocotillo Road (all 4 legs), and Combs Road (east leg); sidewalk installation on west side from Chandler Heights Road to 250 feet south of Via De Arboles; install raised median on Combs Rd from Gantzel Rd to 250 feet west of Gantzel Rd.		
4.	Describe the location of this safety project:		

Agency:	Pinal County Public Works	Title of Project:	Gantzel Road, Ocotillo Road to Combs Road
County:	Pinal County	COG/MPO:	MAG
District:	Central	Date:	23-May-18
4a.	Gantzel Road from Ocotillo Road to Combs Road.		
5.	What crash data screening method was used to identify this project?		
5a.	Network screening of most recent five years of crash data ending December 31, 2016 as part of the development of the Pinal County STSP.		
6.	What is the safety justification for the proposed project?		
6a.	To address intersection and pedestrian crashes.		
7.	Will there be ground disturbing activities?	<input checked="" type="checkbox"/> YES	<input 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 type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
10a.	If YES please explain:		
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

Agency:	Pinal County Public Works	Title of Project:	Gantzel Road, Ocotillo Road to Combs Road		
County:	Pinal County	COG/MPO:	MAG		
District:	Central	Date:	23-May-18		
12a.	If YES please explain:				
13.	Is this project in compliance with revised ADA Standards?			<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
13a.	If NO please explain:				
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:		Rural Minor Arterial		
17.	Average Daily Traffic Volume and Year Collected:		ADT: 26,120	Year: 2014	
18.	What is the source of ADT?:	Pinal County Count Program			
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.					

Agency:	Pinal County Public Works	Title of Project:	Gantzel Road, Ocotillo Road to Combs Road
County:	Pinal County	COG/MPO:	MAG
District:	Central	Date:	23-May-18
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?	2012-2016	
	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 checked="" type="checkbox"/> YES <input type="checkbox"/> NO
34.	If YES please explain:	Widening of Hunt Highway	
35.	Project vicinity map is provided:		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
36.	Project work limits map is provided:		<input checked="" type="checkbox"/> YES <input 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 improvement.	
37b.	Does this project support a second SHSP EA? If so, which EA.:	Roadway_Infrastructure_and_Operations	
37c.	Which EA Strategy supports the second EA?	(Intersections) Reduce frequency and severity of intersection crashes through geometric improvement	
37d.	Does this project support a third SHSP EA? If so, which EA.:	Nonmotorized_Users	

Agency:	Pinal County Public Works	Title of Project:	Gantzel Road, Ocotillo Road to Combs Road
County:	Pinal County	COG/MPO:	MAG
District:	Central	Date:	23-May-18
37e.	Which EA Strategy supports the third EA?	(Pedestrians) Reduce pedestrian exposure to vehicle traffic	
38.	Does this project support one of the nine FHWA proven countermeasures?:	<input checked="" 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:	Intersections, Pedestrians	
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. (For Local Agencies Only)		
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:		
43.	For State Agencies, has the Regional Traffic Engineer been made aware of this potential project and does he/she concur with it?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
B/C Ratio			
44.	The calculated B/C Ratio is:	29.40	

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

Agency:		Pinal County Public Works	Name of Project:	Gantzel Road	Spot Improvement				
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%	0.00%	
Scoping			1	\$ 20,000.00	\$ 20,000.00	\$ 19,505.87	\$ 494.13	\$ -	\$ 20,000.00
Design:			1	\$140,000.00	\$ 140,000.00	\$ 136,541.09	\$ 3,458.91	\$ -	\$ 140,000.00
Environmental Clearance			1	\$ 20,000.00	\$ 20,000.00	\$ 19,505.87	\$ 494.13	\$ -	\$ 20,000.00
ADOT Admin Costs:			1	\$ 30,000.00	\$ 30,000.00	\$ 29,258.80	\$ 741.20	\$ -	\$ 30,000.00
Design Sub-Total					\$ 210,000.00	\$ 204,811.63	\$ 5,188.37	\$ -	\$ 210,000.00
Construction:	Intall Flashing Yellow Arrow Signals at Ocotillo Rd, Combs Rd	EA	2	\$ 80,000.00	\$ 160,000.00	\$ 160,000.00	No Match Required	\$ -	\$ 160,000.00
Construction:	Median modifications to improve left-turn negative offset at Ocotillo Rd (4 legs), Combs Rd (east leg)	EA	5	\$ 20,000.00	\$ 100,000.00	\$ 94,300.00	\$ 5,700.00		\$ 100,000.00
Construction:	Install sidewalk west side of Gantzel Rd from Chandler Heights Rd to 250 feet south of Via De Arboles	Sq Ft	5280	\$ 3.25	\$ 17,160.00	\$ 16,181.88	\$ 978.12		\$ 17,160.00
Construction:	Install raised median on Combs Rd from Gantzel Rd to 250 feet west of Gantzel Rd	Sq Ft	750	\$ 7.00	\$ 5,250.00	\$ 4,950.75	\$ 299.25		\$ 5,250.00
HSIP Eligible Sub-Total			0		\$ 282,410.00	\$ 275,432.63	\$ 6,977.37	\$ -	\$ 282,410.00
Non-HSIP Eligible Sub-Total					\$ -	\$ -	\$ -	\$ -	\$ -
Construction Sub-Total					\$ 282,410.00	\$ 275,432.63	\$ 6,977.37	\$ -	\$ 282,410.00
Traffic Control:			10.00%		\$ 28,241.00	\$ 27,543.26	\$ 697.74	\$ -	\$ 28,241.00
Mobilization:			10.00%		\$ 28,241.00	\$ 27,543.26	\$ 697.74	\$ -	\$ 28,241.00
Construction Sub-Total					\$ 338,892.00	\$ 330,519.16	\$ 8,372.84	\$ -	\$ 338,892.00
Construction Admin :			14.00%		\$ 47,444.88	\$ 46,272.68	\$ 1,172.20	\$ -	\$ 47,444.88
Contingencies :			5.00%		\$ 16,944.60	\$ 16,525.96	\$ 418.64	\$ -	\$ 16,944.60
Post Design:			1.00%		\$ 3,388.92	\$ 3,305.19	\$ 83.73	\$ -	\$ 3,388.92
Communications:			5.00%		\$ 16,944.60	\$ 16,525.96	\$ 418.64	\$ -	\$ 16,944.60
					\$ -	\$ -	\$ -	\$ -	\$ -
Post Sub-Total					\$ 84,723.00	\$ 82,629.79	\$ 2,093.21	\$ -	\$ 84,723.00
Post Const Sub-Total					\$ 423,615.00	\$ 413,148.95	\$ 10,466.05	\$ -	\$ 423,615.00
TOTAL REQUEST					\$ 633,615.00	\$ 617,960.58	\$ 15,654.42	\$ -	\$ 633,615.00

Comments:

Required for all HSIP Applications

Agency:	Pinal County	Title of Project:	Gantzel Road
----------------	--------------	--------------------------	--------------

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	0.60	60%	0.36	\$5,800,000	\$2,088,000
Incapacitating Injury	1.00	47%	0.47	\$400,000	\$188,000
Total Annual Benefits					\$2,276,000

Costs

Total Project Cost	\$633,615
Project Life (years)	14
Interest Rate (%)	8%
Capital Recovery Factor	0.1213
Annual Construction Cost	\$76,856
Annual Maintenance Cost	\$300
Total Annual Costs	\$77,156

Benefit / Cost

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$2,276,000	\$77,156	29.4

***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. CMF ID 3035 Install Raised Median: 44% CRF All Crashes, Severity K, A.

Required for all HSIP Applications

Agency:	Pinal County	Title of Project:	Gantzel Rd West Sidewalk Installation, Chandler Heights Rd to 250 feet south of Via De Arboles
----------------	--------------	--------------------------	--

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

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

Costs

Total Project Cost	\$75,000
Project Life (years)	20
Interest Rate (%)	8%
Capital Recovery Factor	0.1019
Annual Construction Cost	\$7,639
Annual Maintenance Cost	\$300
Total Annual Costs	\$7,939

Benefit / Cost

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$1,032,400	\$7,939	130.0

***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**

Required for all HSIP Applications

Agency:	Pinal County	Title of Project:	Gantzel Road Negative Offset Improvement Ocotillo Rd, all 4 legs
----------------	--------------	--------------------------	--

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	0.00		0.00	\$5,800,000	\$0
Incapacitating Injury	1.00	37%	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

Agency:	Pinal County	Title of Project:	Gantzel Rd Negative Offset Improvement Combs Rd, east leg
----------------	--------------	--------------------------	---

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	0.00		0.00	\$5,800,000	\$0
Incapacitating Injury	1.00	37%	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

Agency:	Pinal County	Title of Project:	Gantzel Rd Flashing Yellow Arrow at Ocotillo Rd
----------------	--------------	--------------------------	---

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	0.20	8%	0.02	\$5,800,000	\$92,800
Incapacitating Injury	0.80	16%	0.13	\$400,000	\$51,200
Total Annual Benefits					\$144,000

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
\$144,000	\$27,125	5.3

***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.

Required for all HSIP Applications

Agency:	Pinal County	Title of Project:	Gantzel Rd Flashing Yellow Arrow at Combs Rd
----------------	--------------	--------------------------	--

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	0.20	19%	0.04	\$5,800,000	\$220,400
Incapacitating Injury	0.00		0.00	\$400,000	\$0
Total Annual Benefits					\$220,400

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
\$220,400	\$27,125	8.1

***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 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

Agency:	Pinal County	Title of Project:	Combs Rd Raised Median from Gantzel to 250 Feet west of Gantzel
----------------	--------------	--------------------------	---

Benefit / Cost Ratio Tabulation

Annual Benefit Tabulation

Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	0.00	44%	0.00	\$5,800,000	\$0
Incapacitating Injury	0.20	44%	0.09	\$400,000	\$35,200
Total Annual Benefits					\$35,200

Costs

Total Project Cost	\$68,000
Project Life (years)	20
Interest Rate (%)	8%
Capital Recovery Factor	0.1019
Annual Construction Cost	\$6,926
Annual Maintenance Cost	\$300
Total Annual Costs	\$7,226

Benefit / Cost

Annual Benefit	Annual cost	Benefit / Cost Ratio
\$35,200	\$7,226	4.8

***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 ID 3035 Install Raised Median: 44% CRF All Crashes, Severity K, A

Id	Date	Date	Time	Onroad	CrossingFeature	Offset	InjurySeverity	FirstHarmful	CollisionManner Desc	LightCondition	Weather	IntersectionTypeDesc	JunctionRelation Desc	TrafficWayType	UnitTravelDirectionDesc	UnitActionDesc	UnitRoadConditionDesc1	SurfaceCondition	EnvCondition	UnitDefect	UnitNumber	UnitEvent Sequence	UnitEvent Sequence	UnitEvent Sequence	PersonSafety Device	PersonViolation	PersonPhysical	PersonPhysical	
2644954	#####	5/25/2012	7:25:00 AM	Gantzel Rd	Ocotillo Rd	0	Fatal	Motor Vehicle in Transport	Angle	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	Curb	Traffic Sign Support	Concrete Traffic Barrier	Shoulder and Lap Belt	Disregarded Traffic Signal	Alcohol	Drugs
2665819	#####	10/11/2012	6:37:00 AM	Gantzel Rd	Ocotillo Rd	0	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Dark - Lighted	Clear	Four Way Intersection	Intersection Interchange	Unknown	South	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	Curb	Tree/Bush/Stump Standing	Other Fixed Object	Shoulder and Lap Belt	Inattention Distraction	No Apparent	
2702488	#####	12/22/2012	2:16:00 AM	Combs Rd	Gantzel Rd	0	Fatal	Motor Vehicle in Transport	Left Turn	Daylight	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Not Divided with Continuous Left Turn Lane	East	Making Left Turn	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	None	None	None	Shoulder and Lap Belt	Failed to Yield Right of Way	No Apparent Influence	
2815222	#####	2/15/2014	7:27:00 AM	Gantzel Rd	Ocotillo Rd	0	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Dark - Lighted	Clear	T 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	None	None	None	Unknown	Other	No Apparent Influence	
2895982	#####	9/21/2014	9:44:00 AM	Gantzel Rd	Via De Arboles	-0.02	Fatal	Pedestrian	Other	Dark - Not Lighted	Clear	Not Intersection	Not Junction Related	Two Way Not Divided	North	Going Straight Ahead	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Pedestrian	None	None	None	Shoulder and Lap Belt	Unknown	Unknown	
3008643	#####	10/17/2015	9:06:00 AM	Ocotillo Rd	Gantzel Rd	0	Incapacitating Injury	Motor Vehicle in Transport	Other	Dark - Lighted	Rain	Four Way Intersection	Intersection Non Interchange	Two Way Divided Positive Median Barrier	West	Going Straight Ahead	Unknown	Wet	Unknown	Unknown	1	Motor Vehicle in Transport	Traffic Sign Support	None	None	Shoulder and Lap Belt	Failed to Yield Right of Way	No Apparent	
3154579	#####	10/7/2016	#####	Ironwood Dr	Ocotillo Rd	0	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Dark - Lighted	Clear	Four Way Intersection	Intersection Non Interchange	Two Way Not Divided	South	Making Left Turn	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	None	None	None	Shoulder and Lap Belt	Failed to Yield Right	No Apparent	
2804342	#####	12/12/2013	#####	Combs Rd	Gantzel Rd	-0.06	Incapacitating Injury	Motor Vehicle in Transport	Left Turn	Dark - Lighted	Clear	T Intersection	Driveway	Two Way Divided Unprotected Painted 4 Feet Median	North	Making Left Turn	No Contributing Circumstances	Dry	No Contributing Circumstances	No Contributing Circumstances	1	Motor Vehicle in Transport	None	None	None	None Used	Failed to Yield Right of Way	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.