Rural Task Force Region Four
Road Project Application

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Section 1. Applicant Information			
Agency Name	Berrien County Road Department		
Contact Name	Brian Berndt	Title	County Highway Engineer
Phone Number	269 925 1196 ext 4407	Email	bberndt@bcroad.org

Section 2. Project Information			
Project Name/Road Name	Red Arrow Highway		
Township/City/Village	Chikaming Township and New Buffalo Township		
Project Limits (e.g. Napier Ave. to Britain Ave.)	Community Hall Road to Berrien Street		
Project Length (nearest hundredth of a mile)	1.32	Proposed Year of Funding	2020
Primary Work Type	☒ Reconstruct ☐ Restore & Rehabilitate ☐ Roadside Facility ☐ Resurface ☐ Traffic Operations/Safety ☐ Transit ☐ Other		
Project Description (Please provide major work items including sidewalks, utility work, ADA upgrades etc.)	Intersection Improvement Project at Union Pier Road		

Section 3. Project Funding	
Federal STBG Requested	$ 772,000
State D	$ 108,176
CTF	$
Local Funds	$ 119,824
Total	$ 1,000,000
Match Percentage (match/total cost)	12.0 %
Does your agency have the financial capacity to Advance Construct (AC) all or part of this project if necessary? If yes, what is the maximum dollar amount your agency is willing to Advance Construct (AC)?	☐ Yes ☒ No Maximum Dollar Amount you can AC? $

Section 4. System Preservation

PASER rating	3
Current state of drainage	☐ Adequate ☒ Minor and tolerable drainage problems ☐ Occasional drainage problems with some maintenance required ☐ Inadequate drainage, frequent flooding, excessive maintenance required
Expected increase in Remaining Service life (RSL)	☐ 0-3 years ☐ 4-6 ☐ 7-9 ☐ 10-14 ☒ 15-20 Use MDOT's *Guidelines for Geometrics on Local Projects*
What guidelines does the project conform to?	☒ Reconstruction (4R) ☐ Resurfacing, restoration, and Rehabilitation (3R) ☐ Preventative Maintenance (PM)

Section 5. Safety

Please list the number and severity of crashes within the proposed project limits over the last 5 yrs. (2013-2017) (see Michigan Crash Facts for crash data)

Total Crashes	27	Pedestrian & Bicycle Crashes	1
Fatalities	0	Serious Injuries	9

Using the attached Crash Reduction Factors sheet, please check each safety counter measure that will be included in the project

Describe any other safety improvements this project will provide	Reconstruct intersection at Union Pier Road

Section 6. Non-motorized Improvements

Please explain any pedestrian and/or bicycle improvements are included	Cross Walk at Union Pier Road
Does this project connect to an existing pedestrian/bicycle facility or one that is planned to be completed from 2020-2023?	☐ Yes ☒ No If yes, please provide a map of the connecting facilities

Section 7. Regional Connectivity

What is the most current daily traffic count for the limits of this project?	☐ Less than 2000 ☐ 2000-5000 ☒ 5000-10,000 ☐ Above 10,000 Year of count: 2014 Source: TAMC
National Functional Classification (NFC) for this roadway	Minor Arterial
Is the project on an All Season Road	☒ Yes ☐ No ☐ Not Sure

Section 8. Strategic Planning & Investment	
Is the project identified in a Asset Management Plan, or Capital Improvement Plan	☒ Yes ☐ No If yes, please cite the plan and page number: BCRD 2018 Plan
Is the project identified in another planning documents such as a master plan or parks and recreation plan	☐ Yes ☒ No If yes, please cite the plan and page number:
Does the project cross jurisdictional boundaries?	☒ Yes ☐ No
If yes, will it be bid as a single project?	☒ Yes ☐ No ☐ NA
Will this project coordinate with other infrastructure projects (i.e. utility, water, sewer, etc.)	☒ Yes ☐ No If yes, please indicate the project type and construction year:
How many water main breaks have you had at this location in the past five years?	
Is there a completed a utilities assessment that included televising the sewers in the project area?	☐ Yes ☒ No
Will this project require environmental mitigation, purchase of Right of Way (ROW), or railroad permits?	☐ Yes ☒ No ☐ Not Sure If yes, which items are required:
Does this project perform Resurfacing, Reconstruction, or Preventative Maintenance on a segment adjacent to a segment where a federally-funded project was done during the 2017-https://www.swmpc.org/downloads/rtf_region4_20172020_project_list.pdf2020 RTF cycle?	☒ Yes ☐ No What segment was the PREVIOUS project done on? 2018 and 2019 Red Arrow Highway Projects

Section 9. Existing and Proposed Roadway Design

	Existing			Proposed		
Number of Vehicle Lanes	Through Traffic Lanes	Center Turn Lane	On Street Parking	Through Traffic Lanes	Center Turn Lane	On Street Parking
	4	0	☐ Yes ☒ No	2	1	☐ Yes ☒ No
Shoulder Surface	☐ Paved ☒ Unpaved	Width (ft.) 6		☒ Paved ☐ Unpaved		Width (ft.) 6
Sidewalk/ path information	**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None	Width (ft.)		**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None		Width (ft.)
On road bicycle facilities	☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☐ Wide Shoulders ☒ None			☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☒ Wide Shoulders ☐ None		
Utilities, Sewer and Water	☐ Utilities Upgrades Needed ☐ Sewer and water work needed			☐ Replaced Utilities ☐ Relocating Utilities ☐ Sewer and Water Line Work		
Please describe any improvements being made as part of this project to crosswalks, signage or signals, or streetscape elements not discussed in project description	Construct cross walk, new pavement markings and signs.					

Section 10. Estimated Project Schedule

Activity	Estimated Date
Resolution of Support for☐ Local Match Submitted to SWMPC	10/1/19
Project Application Submitted to MOT	10/1/19
Grade Inspection Package Submitted to MDOT	12/1/19
Grade Inspection Meeting Scheduled	1/1/20
Final Plan and Estimate to MDOT	2/1/20
Right of Way (ROW) certified*	2/1/20
Rail Road Permits*	N/A
Environmental Mitigation*	2/1/20
Project Obligated	3/1/20
Project Letting	3/1/20
Construction Start☐	9/1/20
Project Completion	11/15/20

*Enter NA if these items will not be required.

	Proposed Improvement	% Reduction	Associated Crash Types
	SEGMENT CRASH REDUCTION FACTORS		
	Geometric Safety Enhancements		
☒	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Sideswipe*
		15%	Non Left-Turn Rear-End, Other*
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		30%	Angle
		15%	Rear-End
		10%	Other*
☐	**Horizontal Curve Flattening**	30%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **1'** each side)*	5%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **2'** each side)*	10%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **3'** each side)*	15%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **4'** each side)*	20%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **5'** each side)*	25%	Lane Departure***
☒	**Shoulders -** *Widen to Standard Width (add **6'** each side)*	30%	Lane Departure***
☐			
☐	**Shoulders -** *Widen to Standard Width (add **7'** each side)*	35%	Lane Departure***
☐	**Vertical Curve Modification**	20%	All Applicable Crash Types +++
	General Segment Enhancements		
☐	**Access Management -** *Improve*	15%	Drive-way Related Applicable Crashes
☐	**Centerline Rumble Strips -** *Install*	44%	K and A injury Applicable Crashes
		46%	Single Vehicle Run off Road Left Crashes
		43%	Sideswipe Same Crashes
		55%	Sideswipe Opposite Crashes
☒	**High Friction Surface Treatment -** *Install*	35%	Wet Crashes
		20%	All Other Applicable Crashes
☐	**Recessed Durable Pavement Markings**	5%	All Applicable Crashes
☐	**Pedestrian Refuge -** *Install*	50%	Pedestrian Crashes (Review NCHRP Report 841)
☐	**Road Diet (4-3 Lane Conversion)** - *Install*	50%	Suburban - All Applicable Crashes
☐	**Shoulder Rumble Strips**	20%	Run-Off the Road Right Crashes
☐	**Signing/Delineation on Horizontal Curves (Including Recessed Durable Pavement Markings) -** *Install*	20%	Lane Departure***

☐	**Safety Edge Improvement**	13%	All non-intersection crashes (CMF Clearing House ID 8658)

	Roadside Enhancements		
☐	**Bicycle Lanes -** Install per standards	50%	Bicycle Crashes
☐	**Shared Use Path -** *Install*	33%	Bicycle and Pedestrian Related Crashes
☐	**Fixed Objects From Clearzone (Trees, Culverts, Etc.) -** *Removal*	75%	Fixed-Object Applicable Crashes
☐	**Guardrail -** *Install*	55%	Lane Departure ***Fatalities and "A" Injury Applicable Crashes
☐	**Sidewalk for Pedestrians -** *Construct*	85%	Pedestrian Crashes
☐	**Slope Flattening**	15%	Fixed-Object, Overturn Applicable Crashes
☐	**Living Snow Fence**	20%	Crashes due to wintry surface conditions
☐	**Lighting -** *install on segment*	20%	Dark Unlighted Crashes
	INTERSECTION CRASH REDUCTION FACTORS		
	Pedestrian / Bicycle Enhancements		
☐	**Bump Out / Curb Extension -** *Remove Parking / Install*	30%	All Crashes
☐	**Bicycle Lanes -** Install per standards	25%	Bicycle Crashes
☐	**Sidewalk for Pedestrians -** *Construct*	85%	Pedestrian Crashes
☐	**Intersection Lighting** - *install*	75%	Pedestrian Fatal - Dark Unlighted Crashes
		40%	Pedestrian A-Injury - Dark Unlighted Crashes
		30%	All Applicable Dark Unlighted Crashes
☐	**Rectangular Rapid Flashing Beacons**	47%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Install new Pedestrian signal*	30%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Upgrade from existing Pedestrian signal*	25%	Pedestrian Crashes
	Signal Timing / Hardware Enhancements		
☐	**Multiple Low-Cost Improvements**	3%	Rear-End
		12%	Right-Angle
		3%	Nighttime
☐	**Install Reflectorized Backplates**	15%	All Applicable Crashes
☐	**Add All-Red Clearance Interval -** *Add per ITE*	20%	Head-On Left-Turn, Angle
☐	**Yellow-Change Interval** - *Increase*	10%	All Crash Types
☐	**Box Span Signal -** *Upgrade from Stop Control*	65%	Angle
		-25%	Rear-End (Increases Crashes)
		20%	All Other Non Rear-End Crashes
☐	**Box Span Signal -** *Upgrade from Diagonal Span*	10%	All Applicable Crashes+
☐	**Protected Left-Turn Signal Phase -** *Add*	30%	Left-Turn
☐	**Signal Head Size -** *Increase to 12 "*	10%	All Applicable Crashes +

☐	**Signal Optimization & Timing Updates**	10%	All Applicable Crashes +
☐	**Removing Night Flash from Signal Timing**	50%	Nighttime Flash mode Related Crashes
	Intersection Geometric Enhancements		
☒	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Other
		15%	Non Left-Turn Rear-End
☐	**Intersection Improvements (Realignment, Sight-Distance Improvements, Radii Improvements, Etc.)**	30%	Angle
		15%	Rear-End
		10%	Head-On, Sideswipe, Pedestrian, Bicycle, Left-Turn Related
☐	**Offset Left-Turn Lane -** *Construct*	65%	Angle-Turn, Head-On Left-Turn
		20%	Rear-End Left-Turn
☐	**Offset Right-Turn Lane -** *Construct*	65%	Angle-Turn
		50%	Other Applicable Crashes
		20%	Rear-End Right Turn
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		20%	Applicable Rear-End Crashes, Sideswipe Same Direction
☐	**Roundabout**	78%	Fatal and A-Injury Reduction
		57%	Minor Crash Reduction
☐	**Lighting**	-	See MDOT Interchange Warranted Lighting Guidance and overall MDOT Lighting Guidance
	General Intersection Enhancements (Non-Signalized Intersections)		
☐	**All-Way Stop Control -** *New Installation*	60%	All Applicable Crashes
☐	**Ground Mounted Flashing Beacons (Red)-** *Install ** *	30%	All Crashes On Install Approach
☐	**Ground Mounted Flashing Beacons(Amber) -** *Install ** *	20%	All Crashes On Install Approach
☐	**Signing -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Pavement Markings -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Reflective Sheeting on Sign Posts** *(lollipops)*	15%	All Applicable Crashes

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Road Project Application

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Section 1. Applicant Information			
Agency Name	Berrien County Road Department		
Contact Name	Brian Berndt	Title	County Highway Engineer
Phone Number	269 925 1196 ext 4407	Email	bberndt@bcroad.org

Section 2. Project Information			
Project Name/Road Name	Red Arrow Highway		
Township/City/Village	Chikaming Township		
Project Limits (e.g. Napier Ave. to Britain Ave.)	3000 feet Northeast of Harbert Road to 2000 feet Southwest of Harbert Road		
Project Length (nearest hundredth of a mile)	0.94	Proposed Year of Funding	2021
Primary Work Type	☒ Reconstruct ☐ Restore & Rehabilitate ☐ Roadside Facility ☐ Resurface ☐ Traffic Operations/Safety ☐ Transit ☐ Other		
Project Description (Please provide major work items including sidewalks, utility work, ADA upgrades etc.)	Intersection Improvement Project at Harbert Road		

Section 3. Project Funding	
Federal STBG Requested	$ 788,000
State D	$ 108,176
CTF	$
Local Funds	$ 103,824
Total	$ 1,000,000
Match Percentage (match/total cost)	10.4 %
Does your agency have the financial capacity to Advance Construct (AC) all or part of this project if necessary? If yes, what is the maximum dollar amount your agency is willing to Advance Construct (AC)?	☐ Yes ☒ No Maximum Dollar Amount you can AC? $

Section 4. System Preservation

PASER rating	4
Current state of drainage	☐ Adequate ☒ Minor and tolerable drainage problems ☐ Occasional drainage problems with some maintenance required ☐ Inadequate drainage, frequent flooding, excessive maintenance required
Expected increase in Remaining Service life (RSL)	☐0-3 years ☐ 4-6 ☐7-9 ☐10-14 ☒15-20 Use MDOT's *Guidelines for Geometrics on Local Projects*
What guidelines does the project conform to?	☒ Reconstruction (4R) ☐ Resurfacing, restoration, and Rehabilitation (3R) ☐Preventative Maintenance (PM)

Section 5. Safety

Please list the number and severity of crashes within the proposed project limits over the last 5 yrs. (2013-2017) (see Michigan Crash Facts for crash data)

Total Crashes	4	Pedestrian & Bicycle Crashes	0
Fatalities	0	Serious Injuries	0

Using the attached Crash Reduction Factors sheet, please check each safety counter measure that will be included in the project

Describe any other safety improvements this project will provide	Reconstruct intersection at Harbert Road

Section 6. Non-motorized Improvements

Please explain any pedestrian and/or bicycle improvements are included	Cross Walk at Harbert Road
Does this project connect to an existing pedestrian/bicycle facility or one that is planned to be completed from 2020-2023?	☐Yes ☒No If yes, please provide a map of the connecting facilities

Section 7. Regional Connectivity

What is the most current daily traffic count for the limits of this project?	☐Less than 2000 ☐2000-5000 ☒ 5000-10,000 ☐Above 10,000 Year of count: 2014 Source: TAMC
National Functional Classification (NFC) for this roadway	Minor Arterial
Is the project on an All Season Road	☒Yes ☐No ☐Not Sure

Section 8. Strategic Planning & Investment	
Is the project identified in a Asset Management Plan, or Capital Improvement Plan	☒ Yes ☐ No If yes, please cite the plan and page number: BCRD 2018 Plan
Is the project identified in another planning documents such as a master plan or parks and recreation plan	☐ Yes ☒ No If yes, please cite the plan and page number:
Does the project cross jurisdictional boundaries?	☐ Yes ☒ No
If yes, will it be bid as a single project?	☐ Yes ☐ No ☐ NA
Will this project coordinate with other infrastructure projects (i.e. utility, water, sewer, etc.)	☒ Yes ☐ No If yes, please indicate the project type and construction year:
How many water main breaks have you had at this location in the past five years?	
Is there a completed a utilities assessment that included televising the sewers in the project area?	☐ Yes ☒ No
Will this project require environmental mitigation, purchase of Right of Way (ROW), or railroad permits?	☐ Yes ☒ No ☐ Not Sure If yes, which items are required:
Does this project perform Resurfacing, Reconstruction, or Preventative Maintenance on a segment adjacent to a segment where a federally-funded project was done during the 2017-https://www.swmpc.org/downloads/rtf_region4_20172020_project_list.pdf2020 RTF cycle?	☒ Yes ☐ No What segment was the PREVIOUS project done on? 2018 and 2019 Red Arrow Highway Projects

Section 9. Existing and Proposed Roadway Design

	Existing			Proposed		
Number of Vehicle Lanes	Through Traffic Lanes	Center Turn Lane	On Street Parking	Through Traffic Lanes	Center Turn Lane	On Street Parking
	4	0	☐ Yes ☒ No	2	1	☐ Yes ☒ No
Shoulder Surface	☐ Paved ☒ Unpaved	Width (ft.) 6		☒ Paved ☐ Unpaved		Width (ft.) 6
Sidewalk/ path information	**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None	Width (ft.)		**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None		Width (ft.)
On road bicycle facilities	☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☐ Wide Shoulders ☒ None			☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☒ Wide Shoulders ☐ None		
Utilities, Sewer and Water	☐ Utilities Upgrades Needed ☐ Sewer and water work needed			☐ Replaced Utilities ☐ Relocating Utilities ☐ Sewer and Water Line Work		
Please describe any improvements being made as part of this project to crosswalks, signage or signals, or streetscape elements not discussed in project description	Construct cross walk, new pavement markings and signs.					

Section 10. Estimated Project Schedule

Activity	Estimated Date
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Grade Inspection Meeting Scheduled	1/1/21
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Rail Road Permits*	N/A
Environmental Mitigation*	2/1/21
Project Obligated	3/1/21
Project Letting	3/1/21
Construction Start☐	9/1/21
Project Completion	11/15/21

*Enter NA if these items will not be required.

	Proposed Improvement	% Reduction	Associated Crash Types
	SEGMENT CRASH REDUCTION FACTORS		
	Geometric Safety Enhancements		
☒	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Sideswipe*
		15%	Non Left-Turn Rear-End, Other*
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		30%	Angle
		15%	Rear-End
		10%	Other*
☐	**Horizontal Curve Flattening**	30%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **1'** each side)*	5%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **2'** each side)*	10%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **3'** each side)*	15%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **4'** each side)*	20%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **5'** each side)*	25%	Lane Departure***
☒	**Shoulders -** *Widen to Standard Width (add **6'** each side)*	30%	Lane Departure***
☐			
☐	**Shoulders -** *Widen to Standard Width (add **7'** each side)*	35%	Lane Departure***
☐	**Vertical Curve Modification**	20%	All Applicable Crash Types +++
	General Segment Enhancements		
☐	**Access Management -** *Improve*	15%	Drive-way Related Applicable Crashes
☐	**Centerline Rumble Strips -** *Install*	44%	K and A injury Applicable Crashes
		46%	Single Vehicle Run off Road Left Crashes
		43%	Sideswipe Same Crashes
		55%	Sideswipe Opposite Crashes
☒	**High Friction Surface Treatment -** *Install*	35%	Wet Crashes
		20%	All Other Applicable Crashes
☐	**Recessed Durable Pavement Markings**	5%	All Applicable Crashes
☐	**Pedestrian Refuge -** *Install*	50%	Pedestrian Crashes (Review NCHRP Report 841)
☐	**Road Diet (4-3 Lane Conversion)** - *Install*	50%	Suburban - All Applicable Crashes
☐	**Shoulder Rumble Strips**	20%	Run-Off the Road Right Crashes
☐	**Signing/Delineation on Horizontal Curves (Including Recessed Durable Pavement Markings) -** *Install*	20%	Lane Departure***

☐	**Safety Edge Improvement**	13%	All non-intersection crashes (CMF Clearing House ID 8658)

	Roadside Enhancements		
☐	**Bicycle Lanes -** Install per standards	50%	Bicycle Crashes
☐	**Shared Use Path -** *Install*	33%	Bicycle and Pedestrian Related Crashes
☐	**Fixed Objects From Clearzone (Trees, Culverts, Etc.) -** *Removal*	75%	Fixed-Object Applicable Crashes
☐	**Guardrail -** *Install*	55%	Lane Departure ***Fatalities and "A" Injury Applicable Crashes
☐	**Sidewalk for Pedestrians -** *Construct*	85%	Pedestrian Crashes
☐	**Slope Flattening**	15%	Fixed-Object, Overturn Applicable Crashes
☐	**Living Snow Fence**	20%	Crashes due to wintry surface conditions
☐	**Lighting -** *install on segment*	20%	Dark Unlighted Crashes
	INTERSECTION CRASH REDUCTION FACTORS		
	Pedestrian / Bicycle Enhancements		
☐	**Bump Out / Curb Extension -** *Remove Parking / Install*	30%	All Crashes
☐	**Bicycle Lanes -** Install per standards	25%	Bicycle Crashes
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☐	**Intersection Lighting** - *install*	75%	Pedestrian Fatal - Dark Unlighted Crashes
		40%	Pedestrian A-Injury - Dark Unlighted Crashes
		30%	All Applicable Dark Unlighted Crashes
☐	**Rectangular Rapid Flashing Beacons**	47%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Install new Pedestrian signal*	30%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Upgrade from existing Pedestrian signal*	25%	Pedestrian Crashes
	Signal Timing / Hardware Enhancements		
☐	**Multiple Low-Cost Improvements**	3%	Rear-End
		12%	Right-Angle
		3%	Nighttime
☐	**Install Reflectorized Backplates**	15%	All Applicable Crashes
☐	**Add All-Red Clearance Interval -** *Add per ITE*	20%	Head-On Left-Turn, Angle
☐	**Yellow-Change Interval** - *Increase*	10%	All Crash Types
☐	**Box Span Signal -** *Upgrade from Stop Control*	65%	Angle
		-25%	Rear-End (Increases Crashes)
		20%	All Other Non Rear-End Crashes
☐	**Box Span Signal -** *Upgrade from Diagonal Span*	10%	All Applicable Crashes+
☐	**Protected Left-Turn Signal Phase -** *Add*	30%	Left-Turn
☐	**Signal Head Size -** *Increase to 12 "*	10%	All Applicable Crashes +

☐	**Signal Optimization & Timing Updates**	10%	All Applicable Crashes +
☐	**Removing Night Flash from Signal Timing**	50%	Nighttime Flash mode Related Crashes
	Intersection Geometric Enhancements		
☒	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Other
		15%	Non Left-Turn Rear-End
☐	**Intersection Improvements (Realignment, Sight-Distance Improvements, Radii Improvements, Etc.)**	30%	Angle
		15%	Rear-End
		10%	Head-On, Sideswipe, Pedestrian, Bicycle, Left-Turn Related
☐	**Offset Left-Turn Lane -** *Construct*	65%	Angle-Turn, Head-On Left-Turn
		20%	Rear-End Left-Turn
☐	**Offset Right-Turn Lane -** *Construct*	65%	Angle-Turn
		50%	Other Applicable Crashes
		20%	Rear-End Right Turn
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		20%	Applicable Rear-End Crashes, Sideswipe Same Direction
☐	**Roundabout**	78%	Fatal and A-Injury Reduction
		57%	Minor Crash Reduction
☐	**Lighting**	-	See MDOT Interchange Warranted Lighting Guidance and overall MDOT Lighting Guidance
	General Intersection Enhancements (Non-Signalized Intersections)		
☐	**All-Way Stop Control -** *New Installation*	60%	All Applicable Crashes
☐	**Ground Mounted Flashing Beacons (Red)-** *Install **	30%	All Crashes On Install Approach
☐	**Ground Mounted Flashing Beacons(Amber) -** *Install **	20%	All Crashes On Install Approach
☐	**Signing -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Pavement Markings -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Reflective Sheeting on Sign Posts** *(lollipops)*	15%	All Applicable Crashes

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Contact Name	Brian Berndt	Title	County Highway Engineer
Phone Number	269 925 1196 ext 4407	Email	bberndt@bcroad.org

Section 2. Project Information			
Project Name/Road Name	Red Arrow Highway		
Township/City/Village	Chikaming Township		
Project Limits (e.g. Napier Ave. to Britain Ave.)	2000 feet Southwest of Harbert Road to Cherry Beach Road and from Sawyer Road to 3000 feet Northeast of Harbert Road		
Project Length (nearest hundredth of a mile)	1.35	Proposed Year of Funding	2022
Primary Work Type	☐ Reconstruct ☐ Restore & Rehabilitate ☐ Roadside Facility ☒ Resurface ☐ Traffic Operations/Safety ☐ Transit ☐ Other		
Project Description (Please provide major work items including sidewalks, utility work, ADA upgrades etc.)	Mill and Fill		

Section 3. Project Funding	
Federal STBG Requested	$ 803,000
State D	$ 108,176
CTF	$
Local Funds	$ 103,824
Total	$ 1,015,000
Match Percentage (match/total cost)	10.2 %
Does your agency have the financial capacity to Advance Construct (AC) all or part of this project if necessary? If yes, what is the maximum dollar amount your agency is willing to Advance Construct (AC)?	☐ Yes ☒ No Maximum Dollar Amount you can AC? $

Section 4. System Preservation

PASER rating	4
Current state of drainage	☐ Adequate ☒ Minor and tolerable drainage problems ☐ Occasional drainage problems with some maintenance required ☐ Inadequate drainage, frequent flooding, excessive maintenance required
Expected increase in Remaining Service life (RSL)	☐ 0-3 years ☐ 4-6 ☐ 7-9 ☐ 10-14 ☒ 15-20 Use MDOT's *Guidelines for Geometrics on Local Projects*
What guidelines does the project conform to?	☐ Reconstruction (4R) ☒ Resurfacing, restoration, and Rehabilitation (3R) ☐ Preventative Maintenance (PM)

Section 5. Safety

Please list the number and severity of crashes within the proposed project limits over the last 5 yrs. (2013-2017) (see Michigan Crash Facts for crash data)

Total Crashes	9	Pedestrian & Bicycle Crashes	1
Fatalities	0	Serious Injuries	4

Using the attached Crash Reduction Factors sheet, please check each safety counter measure that will be included in the project

Describe any other safety improvements this project will provide	Better driving surface.

Section 6. Non-motorized Improvements

Please explain any pedestrian and/or bicycle improvements are included	
Does this project connect to an existing pedestrian/bicycle facility or one that is planned to be completed from 2020-2023?	☐ Yes ☒ No If yes, please provide a map of the connecting facilities

Section 7. Regional Connectivity

What is the most current daily traffic count for the limits of this project?	☐ Less than 2000 ☐ 2000-5000 ☒ 5000-10,000 ☐ Above 10,000 Year of count: 2014 Source: TAMC
National Functional Classification (NFC) for this roadway	Minor Arterial
Is the project on an All Season Road	☒ Yes ☐ No ☐ Not Sure

Section 8. Strategic Planning & Investment	
Is the project identified in a Asset Management Plan, or Capital Improvement Plan	☒ Yes ☐ No If yes, please cite the plan and page number: BCRD 2018 Plan
Is the project identified in another planning documents such as a master plan or parks and recreation plan	☐ Yes ☒ No If yes, please cite the plan and page number:
Does the project cross jurisdictional boundaries?	☐ Yes ☒ No
If yes, will it be bid as a single project?	☐ Yes ☐ No ☐ NA
Will this project coordinate with other infrastructure projects (i.e. utility, water, sewer, etc.)	☒ Yes ☐ No If yes, please indicate the project type and construction year:
How many water main breaks have you had at this location in the past five years?	
Is there a completed a utilities assessment that included televising the sewers in the project area?	☐ Yes ☒ No
Will this project require environmental mitigation, purchase of Right of Way (ROW), or railroad permits?	☐ Yes ☒ No ☐ Not Sure If yes, which items are required:
Does this project perform Resurfacing, Reconstruction, or Preventative Maintenance on a segment adjacent to a segment where a federally-funded project was done during the 2017-https://www.swmpc.org/downloads/rtf_region4_20172020_project_list.pdf2020 RTF cycle?	☒ Yes ☐ No What segment was the PREVIOUS project done on? 2018 and 2019 Red Arrow Highway Projects

Section 9. Existing and Proposed Roadway Design

	Existing			Proposed		
Number of Vehicle Lanes	Through Traffic Lanes	Center Turn Lane	On Street Parking	Through Traffic Lanes	Center Turn Lane	On Street Parking
	4	0	☐ Yes ☒ No	4	0	☐ Yes ☒ No
Shoulder Surface	☐ Paved ☒ Unpaved	Width (ft.) 6		☒ Paved ☒ Unpaved		Width (ft.) 3 foot paved and 3 foot gravel
Sidewalk/ path information	**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None	Width (ft.)		**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None		Width (ft.)
On road bicycle facilities	☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☐ Wide Shoulders ☒ None			☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☒ Wide Shoulders ☐ None		
Utilities, Sewer and Water	☐ Utilities Upgrades Needed ☐ Sewer and water work needed			☐ Replaced Utilities ☐ Relocating Utilities ☐ Sewer and Water Line Work		
Please describe any improvements being made as part of this project to crosswalks, signage or signals, or streetscape elements not discussed in project description	New pavement markings and signs.					

Section 10. Estimated Project Schedule

Activity	Estimated Date
Resolution of Support for☐ Local Match Submitted to SWMPC	10/1/21
Project Application Submitted to MOT	10/1/21
Grade Inspection Package Submitted to MDOT	12/1/21
Grade Inspection Meeting Scheduled	1/1/22
Final Plan and Estimate to MDOT	2/1/22
Right of Way (ROW) certified*	2/1/22
Rail Road Permits*	N/A
Environmental Mitigation*	2/1/22
Project Obligated	3/1/22
Project Letting	3/1/22
Construction Start☐	9/1/22
Project Completion	11/15/22

*Enter NA if these items will not be required.

	Proposed Improvement	% Reduction	Associated Crash Types
	SEGMENT CRASH REDUCTION FACTORS		
	Geometric Safety Enhancements		
☐	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Sideswipe*
		15%	Non Left-Turn Rear-End, Other*
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		30%	Angle
		15%	Rear-End
		10%	Other*
☐	**Horizontal Curve Flattening**	30%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **1'** each side)*	5%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **2'** each side)*	10%	Lane Departure***
☒	**Shoulders -** *Widen to Standard Width (add **3'** each side)*	15%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **4'** each side)*	20%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **5'** each side)*	25%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **6'** each side)*	30%	Lane Departure***
☐			
☐	**Shoulders -** *Widen to Standard Width (add **7'** each side)*	35%	Lane Departure***
☐	**Vertical Curve Modification**	20%	All Applicable Crash Types +++
	General Segment Enhancements		
☐	**Access Management -** *Improve*	15%	Drive-way Related Applicable Crashes
☐	**Centerline Rumble Strips -** *Install*	44%	K and A injury Applicable Crashes
		46%	Single Vehicle Run off Road Left Crashes
		43%	Sideswipe Same Crashes
		55%	Sideswipe Opposite Crashes
☒	**High Friction Surface Treatment -** *Install*	35%	Wet Crashes
		20%	All Other Applicable Crashes
☐	**Recessed Durable Pavement Markings**	5%	All Applicable Crashes
☐	**Pedestrian Refuge -** *Install*	50%	Pedestrian Crashes (Review NCHRP Report 841)
☐	**Road Diet (4-3 Lane Conversion)** - *Install*	50%	Suburban - All Applicable Crashes
☐	**Shoulder Rumble Strips**	20%	Run-Off the Road Right Crashes
☐	**Signing/Delineation on Horizontal Curves (Including Recessed Durable Pavement Markings) -** *Install*	20%	Lane Departure***

☐	**Safety Edge Improvement**	13%	All non-intersection crashes (CMF Clearing House ID 8658)

	Roadside Enhancements		
☐	**Bicycle Lanes -** Install per standards	50%	Bicycle Crashes
☐	**Shared Use Path -** *Install*	33%	Bicycle and Pedestrian Related Crashes
☐	**Fixed Objects From Clearzone (Trees, Culverts, Etc.) -** *Removal*	75%	Fixed-Object Applicable Crashes
☐	**Guardrail -** *Install*	55%	Lane Departure ***Fatalities and "A" Injury Applicable Crashes
☐	**Sidewalk for Pedestrians -** *Construct*	85%	Pedestrian Crashes
☐	**Slope Flattening**	15%	Fixed-Object, Overturn Applicable Crashes
☐	**Living Snow Fence**	20%	Crashes due to wintry surface conditions
☐	**Lighting -** *install on segment*	20%	Dark Unlighted Crashes
	INTERSECTION CRASH REDUCTION FACTORS		
	Pedestrian / Bicycle Enhancements		
☐	**Bump Out / Curb Extension -** *Remove Parking / Install*	30%	All Crashes
☐	**Bicycle Lanes -** Install per standards	25%	Bicycle Crashes
☐	**Sidewalk for Pedestrians -** *Construct*	85%	Pedestrian Crashes
☐	**Intersection Lighting** - *install*	75%	Pedestrian Fatal - Dark Unlighted Crashes
		40%	Pedestrian A-Injury - Dark Unlighted Crashes
		30%	All Applicable Dark Unlighted Crashes
☐	**Rectangular Rapid Flashing Beacons**	47%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Install new Pedestrian signal*	30%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Upgrade from existing Pedestrian signal*	25%	Pedestrian Crashes
	Signal Timing / Hardware Enhancements		
☐	**Multiple Low-Cost Improvements**	3%	Rear-End
		12%	Right-Angle
		3%	Nighttime
☐	**Install Reflectorized Backplates**	15%	All Applicable Crashes
☐	**Add All-Red Clearance Interval -** *Add per ITE*	20%	Head-On Left-Turn, Angle
☐	**Yellow-Change Interval** - *Increase*	10%	All Crash Types
☐	**Box Span Signal -** *Upgrade from Stop Control*	65%	Angle
		-25%	Rear-End (Increases Crashes)
		20%	All Other Non Rear-End Crashes
☐	**Box Span Signal -** *Upgrade from Diagonal Span*	10%	All Applicable Crashes+
☐	**Protected Left-Turn Signal Phase -** *Add*	30%	Left-Turn
☐	**Signal Head Size -** *Increase to 12 "*	10%	All Applicable Crashes +

☐	**Signal Optimization & Timing Updates**	10%	All Applicable Crashes +
☐	**Removing Night Flash from Signal Timing**	50%	Nighttime Flash mode Related Crashes
	Intersection Geometric Enhancements		
☐	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Other
		15%	Non Left-Turn Rear-End
☐	**Intersection Improvements (Realignment, Sight-Distance Improvements, Radii Improvements, Etc.)**	30%	Angle
		15%	Rear-End
		10%	Head-On, Sideswipe, Pedestrian, Bicycle, Left-Turn Related
☐	**Offset Left-Turn Lane -** *Construct*	65%	Angle-Turn, Head-On Left-Turn
		20%	Rear-End Left-Turn
☐	**Offset Right-Turn Lane -** *Construct*	65%	Angle-Turn
		50%	Other Applicable Crashes
		20%	Rear-End Right Turn
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		20%	Applicable Rear-End Crashes, Sideswipe Same Direction
☐	**Roundabout**	78%	Fatal and A-Injury Reduction
		57%	Minor Crash Reduction
☐	**Lighting**	-	See MDOT Interchange Warranted Lighting Guidance and overall MDOT Lighting Guidance
	General Intersection Enhancements (Non-Signalized Intersections)		
☐	**All-Way Stop Control -** *New Installation*	60%	All Applicable Crashes
☐	**Ground Mounted Flashing Beacons (Red)-** *Install ** *	30%	All Crashes On Install Approach
☐	**Ground Mounted Flashing Beacons(Amber) -** *Install ** *	20%	All Crashes On Install Approach
☐	**Signing -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Pavement Markings -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Reflective Sheeting on Sign Posts** *(lollipops)*	15%	All Applicable Crashes

Rural Task Force Region Four
Road Project Application

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Section 1. Applicant Information			
Agency Name	Berrien County Road Department		
Contact Name	Brian Berndt	Title	County Highway Engineer
Phone Number	269 925 1196 ext 4407	Email	bberndt@bcroad.org

Section 2. Project Information			
Project Name/Road Name	Red Arrow Highway		
Township/City/Village	Chikaming Township		
Project Limits (e.g. Napier Ave. to Britain Ave.)	Lakeside Road to Lakeshore Road		
Project Length (nearest hundredth of a mile)	1.46	Proposed Year of Funding	2023
Primary Work Type	☐ Reconstruct ☐ Restore & Rehabilitate ☐ Roadside Facility ☒ Resurface ☐ Traffic Operations/Safety ☐ Transit ☐ Other		
Project Description (Please provide major work items including sidewalks, utility work, ADA upgrades etc.)	Mill and Fill		

Section 3. Project Funding	
Federal STBG Requested	$ 820,000
State D	$ 108,176
CTF	$
Local Funds	$ 103,824
Total	$ 1,032,000
Match Percentage (match/total cost)	10.1 %
Does your agency have the financial capacity to Advance Construct (AC) all or part of this project if necessary? If yes, what is the maximum dollar amount your agency is willing to Advance Construct (AC)?	☐ Yes ☒ No Maximum Dollar Amount you can AC? $

Section 4. System Preservation

PASER rating	4
Current state of drainage	☐ Adequate ☒ Minor and tolerable drainage problems ☐ Occasional drainage problems with some maintenance required ☐ Inadequate drainage, frequent flooding, excessive maintenance required
Expected increase in Remaining Service life (RSL)	☐ 0-3 years ☐ 4-6 ☐ 7-9 ☐ 10-14 ☒ 15-20 Use MDOT's *Guidelines for Geometrics on Local Projects*
What guidelines does the project conform to?	☐ Reconstruction (4R) ☒ Resurfacing, restoration, and Rehabilitation (3R) ☐ Preventative Maintenance (PM)

Section 5. Safety

Please list the number and severity of crashes within the proposed project limits over the last 5 yrs. (2013-2017) (see Michigan Crash Facts for crash data)

Total Crashes	8	Pedestrian & Bicycle Crashes	0
Fatalities	0	Serious Injuries	4

Using the attached Crash Reduction Factors sheet, please check each safety counter measure that will be included in the project

Describe any other safety improvements this project will provide	Better driving surface.

Section 6. Non-motorized Improvements

Please explain any pedestrian and/or bicycle improvements are included	
Does this project connect to an existing pedestrian/bicycle facility or one that is planned to be completed from 2020-2023?	☐ Yes ☒ No If yes, please provide a map of the connecting facilities

Section 7. Regional Connectivity

What is the most current daily traffic count for the limits of this project?	☐ Less than 2000 ☐ 2000-5000 ☒ 5000-10,000 ☐ Above 10,000 Year of count: 2014 Source: TAMC
National Functional Classification (NFC) for this roadway	Minor Arterial
Is the project on an All Season Road	☒ Yes ☐ No ☐ Not Sure

Section 8. Strategic Planning & Investment	
Is the project identified in a Asset Management Plan, or Capital Improvement Plan	☒ Yes ☐ No If yes, please cite the plan and page number: BCRD 2018 Plan
Is the project identified in another planning documents such as a master plan or parks and recreation plan	☐ Yes ☒ No If yes, please cite the plan and page number:
Does the project cross jurisdictional boundaries?	☐ Yes ☒ No
If yes, will it be bid as a single project?	☐ Yes ☐ No ☐ NA
Will this project coordinate with other infrastructure projects (i.e. utility, water, sewer, etc.)	☒ Yes ☐ No If yes, please indicate the project type and construction year:
How many water main breaks have you had at this location in the past five years?	
Is there a completed a utilities assessment that included televising the sewers in the project area?	☐ Yes ☒ No
Will this project require environmental mitigation, purchase of Right of Way (ROW), or railroad permits?	☐ Yes ☒ No ☐ Not Sure If yes, which items are required:
Does this project perform Resurfacing, Reconstruction, or Preventative Maintenance on a segment adjacent to a segment where a federally-funded project was done during the 2017-https://www.swmpc.org/downloads/rtf_region4_20172020_project_list.pdf2020 RTF cycle?	☒ Yes ☐ No What segment was the PREVIOUS project done on? 2018 and 2019 Red Arrow Highway Projects

Section 9. Existing and Proposed Roadway Design

	Existing			Proposed		
Number of Vehicle Lanes	Through Traffic Lanes	Center Turn Lane	On Street Parking	Through Traffic Lanes	Center Turn Lane	On Street Parking
	4	0	☐ Yes ☒ No	4	0	☐ Yes ☒ No
Shoulder Surface	☐ Paved ☒ Unpaved	Width (ft.) 6		☒ Paved ☒ Unpaved		Width (ft.) 3 foot paved and 3 foot gravel
Sidewalk/ path information	**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None	Width (ft.)		**Placement** ☐ One Side ☐ Both Sides ☐ Intermittent ☒ None		Width (ft.)
On road bicycle facilities	☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☐ Wide Shoulders ☒ None			☐ Bike Lane ☐ Other (specify) _____ ☐ Sharrows ☒ Wide Shoulders ☐ None		
Utilities, Sewer and Water	☐ Utilities Upgrades Needed ☐ Sewer and water work needed			☐ Replaced Utilities ☐ Relocating Utilities ☐ Sewer and Water Line Work		
Please describe any improvements being made as part of this project to crosswalks, signage or signals, or streetscape elements not discussed in project description	New pavement markings and signs.					

Section 10. Estimated Project Schedule

Activity	Estimated Date
Resolution of Support for☐ Local Match Submitted to SWMPC	10/1/22
Project Application Submitted to MOT	10/1/22
Grade Inspection Package Submitted to MDOT	12/1/22
Grade Inspection Meeting Scheduled	1/1/23
Final Plan and Estimate to MDOT	2/1/23
Right of Way (ROW) certified*	2/1/23
Rail Road Permits*	N/A
Environmental Mitigation*	2/1/23
Project Obligated	3/1/23
Project Letting	3/1/23
Construction Start☐	9/1/23
Project Completion	11/15/23

*Enter NA if these items will not be required.

	Proposed Improvement	% Reduction	Associated Crash Types
	SEGMENT CRASH REDUCTION FACTORS		
	Geometric Safety Enhancements		
☐	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Sideswipe*
		15%	Non Left-Turn Rear-End, Other*
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		30%	Angle
		15%	Rear-End
		10%	Other*
☐	**Horizontal Curve Flattening**	30%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **1'** each side)*	5%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **2'** each side)*	10%	Lane Departure***
☒	**Shoulders -** *Widen to Standard Width (add **3'** each side)*	15%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **4'** each side)*	20%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **5'** each side)*	25%	Lane Departure***
☐	**Shoulders -** *Widen to Standard Width (add **6'** each side)*	30%	Lane Departure***
☐			
☐	**Shoulders -** *Widen to Standard Width (add **7'** each side)*	35%	Lane Departure***
☐	**Vertical Curve Modification**	20%	All Applicable Crash Types +++
	General Segment Enhancements		
☐	**Access Management -** *Improve*	15%	Drive-way Related Applicable Crashes
☐	**Centerline Rumble Strips -** *Install*	44%	K and A injury Applicable Crashes
		46%	Single Vehicle Run off Road Left Crashes
		43%	Sideswipe Same Crashes
		55%	Sideswipe Opposite Crashes
☒	**High Friction Surface Treatment -** *Install*	35%	Wet Crashes
		20%	All Other Applicable Crashes
☐	**Recessed Durable Pavement Markings**	5%	All Applicable Crashes
☐	**Pedestrian Refuge -** *Install*	50%	Pedestrian Crashes (Review NCHRP Report 841)
☐	**Road Diet (4-3 Lane Conversion)** - *Install*	50%	Suburban - All Applicable Crashes
☐	**Shoulder Rumble Strips**	20%	Run-Off the Road Right Crashes
☐	**Signing/Delineation on Horizontal Curves (Including Recessed Durable Pavement Markings) -** *Install*	20%	Lane Departure***

☐	**Safety Edge Improvement**	13%	All non-intersection crashes (CMF Clearing House ID 8658)

	Roadside Enhancements		
☐	**Bicycle Lanes -** Install per standards	50%	Bicycle Crashes
☐	**Shared Use Path -** *Install*	33%	Bicycle and Pedestrian Related Crashes
☐	**Fixed Objects From Clearzone (Trees, Culverts, Etc.) -** *Removal*	75%	Fixed-Object Applicable Crashes
☐	**Guardrail -** *Install*	55%	Lane Departure ***Fatalities and "A" Injury Applicable Crashes
☐	**Sidewalk for Pedestrians -** *Construct*	85%	Pedestrian Crashes
☐	**Slope Flattening**	15%	Fixed-Object, Overturn Applicable Crashes
☐	**Living Snow Fence**	20%	Crashes due to wintry surface conditions
☐	**Lighting -** *install on segment*	20%	Dark Unlighted Crashes
	INTERSECTION CRASH REDUCTION FACTORS		
	Pedestrian / Bicycle Enhancements		
☐	**Bump Out / Curb Extension -** *Remove Parking / Install*	30%	All Crashes
☐	**Bicycle Lanes -** Install per standards	25%	Bicycle Crashes
☐	**Sidewalk for Pedestrians -** *Construct*	85%	Pedestrian Crashes
☐	**Intersection Lighting** - *install*	75%	Pedestrian Fatal - Dark Unlighted Crashes
		40%	Pedestrian A-Injury - Dark Unlighted Crashes
		30%	All Applicable Dark Unlighted Crashes
☐	**Rectangular Rapid Flashing Beacons**	47%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Install new Pedestrian signal*	30%	Pedestrian Crashes
☐	**Ped. Countdown Signals -** *Upgrade from existing Pedestrian signal*	25%	Pedestrian Crashes
	Signal Timing / Hardware Enhancements		
☐	**Multiple Low-Cost Improvements**	3%	Rear-End
		12%	Right-Angle
		3%	Nighttime
☐	**Install Reflectorized Backplates**	15%	All Applicable Crashes
☐	**Add All-Red Clearance Interval -** *Add per ITE*	20%	Head-On Left-Turn, Angle
☐	**Yellow-Change Interval** - *Increase*	10%	All Crash Types
☐	**Box Span Signal -** *Upgrade from Stop Control*	65%	Angle
		-25%	Rear-End (Increases Crashes)
		20%	All Other Non Rear-End Crashes
☐	**Box Span Signal -** *Upgrade from Diagonal Span*	10%	All Applicable Crashes+
☐	**Protected Left-Turn Signal Phase -** *Add*	30%	Left-Turn
☐	**Signal Head Size -** *Increase to 12 "*	10%	All Applicable Crashes +

☐	**Signal Optimization & Timing Updates**	10%	All Applicable Crashes +
☐	**Removing Night Flash from Signal Timing**	50%	Nighttime Flash mode Related Crashes
	Intersection Geometric Enhancements		
☐	**Center Left-Turn Lane -** *Construct*	80%	Rear-End Left-Turn
		50%	Head-On Left-Turn
		20%	Head-On, Angle, Other
		15%	Non Left-Turn Rear-End
☐	**Intersection Improvements (Realignment, Sight-Distance Improvements, Radii Improvements, Etc.)**	30%	Angle
		15%	Rear-End
		10%	Head-On, Sideswipe, Pedestrian, Bicycle, Left-Turn Related
☐	**Offset Left-Turn Lane -** *Construct*	65%	Angle-Turn, Head-On Left-Turn
		20%	Rear-End Left-Turn
☐	**Offset Right-Turn Lane -** *Construct*	65%	Angle-Turn
		50%	Other Applicable Crashes
		20%	Rear-End Right Turn
☐	**Right-Turn Lane -** *Construct*	65%	Rear-End Right-Turn
		20%	Applicable Rear-End Crashes, Sideswipe Same Direction
☐	**Roundabout**	78%	Fatal and A-Injury Reduction
		57%	Minor Crash Reduction
☐	**Lighting**	-	See MDOT Interchange Warranted Lighting Guidance and overall MDOT Lighting Guidance
	General Intersection Enhancements (Non-Signalized Intersections)		
☐	**All-Way Stop Control -** *New Installation*	60%	All Applicable Crashes
☐	**Ground Mounted Flashing Beacons (Red)-** *Install ** *	30%	All Crashes On Install Approach
☐	**Ground Mounted Flashing Beacons(Amber) -** *Install ** *	20%	All Crashes On Install Approach
☐	**Signing -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Pavement Markings -** *Improve/Upgrade*	30%	Angle, Rear-End Crashes
☐	**Reflective Sheeting on Sign Posts** *(lollipops)*	15%	All Applicable Crashes