Gadsden County Road Safety Study

Supplement 2 - Countermeasures for Immediate Implementation

7/31/2017

This document represents a preliminary identification of potential highway safety improvements for Gadsden County. It is intended for use in developing a program. Final scope of the projects requires further review and evaluation.

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Summary

The Transportation Safety Center (TSC) at University of Florida, together with Gadsden County Public Works Department and Florida Department of Transportation (FDOT), has conducted a study to identify and develop countermeasures for potential highway safety problems in Gadsden County. The study is documented in detail in the *Gadsden County Road Safety Study Summary Report*. A separate document, *Supplement 1 – Site Analysis and Recommendations,* provides the detailed descriptions of the sites and recommended countermeasures for projects recommended for inclusion in FDOT's Five Year Work Program for HSIP funding. This document describes conditions at typical sites where significant safety improvements can be made at very low cost by Gadsden County work forces or by FDOT using the "Push Button" contracting process.

The intent of this document is to describe typical hazardous conditions and to recommend low cost countermeasures that can be quickly implemented. The sites used as examples in this report were chosen based on a history of severe crashes; however, this is not intended to be a comprehensive list of such safety concerns. Other locations with similar risk factors exist on the road system, and warrant application of these countermeasures. It is envisioned that the systemic safety analysis tool currently under development by University of Florida (UF) would be useful in identifying these sites. However, field personnel with an understanding of the area may be able to readily identify such sites and implement solutions.

These recommendations were developed based on brief site visits, analysis of crash data, and information obtained from available records and photography such as Google Earth. Road numbers and names used were identified from information in Google Earth and NAVTEQ maps. More detailed field reviews will be needed to establish such information as sign placement to conform with criteria of MUTCD and local conditions.

Installation or modification of signing and pavement markings were two most common countermeasures identified for most locations to improve the condition of roadways

Figure 1 shows the serious injury and fatal crash locations in Gadsden County and highlights the typical sites discussed in this report. The tables that follow in the subsequent sections in this report are keyed to the locations on this map. More detailed descriptions of selected sites are included in the Appendix.

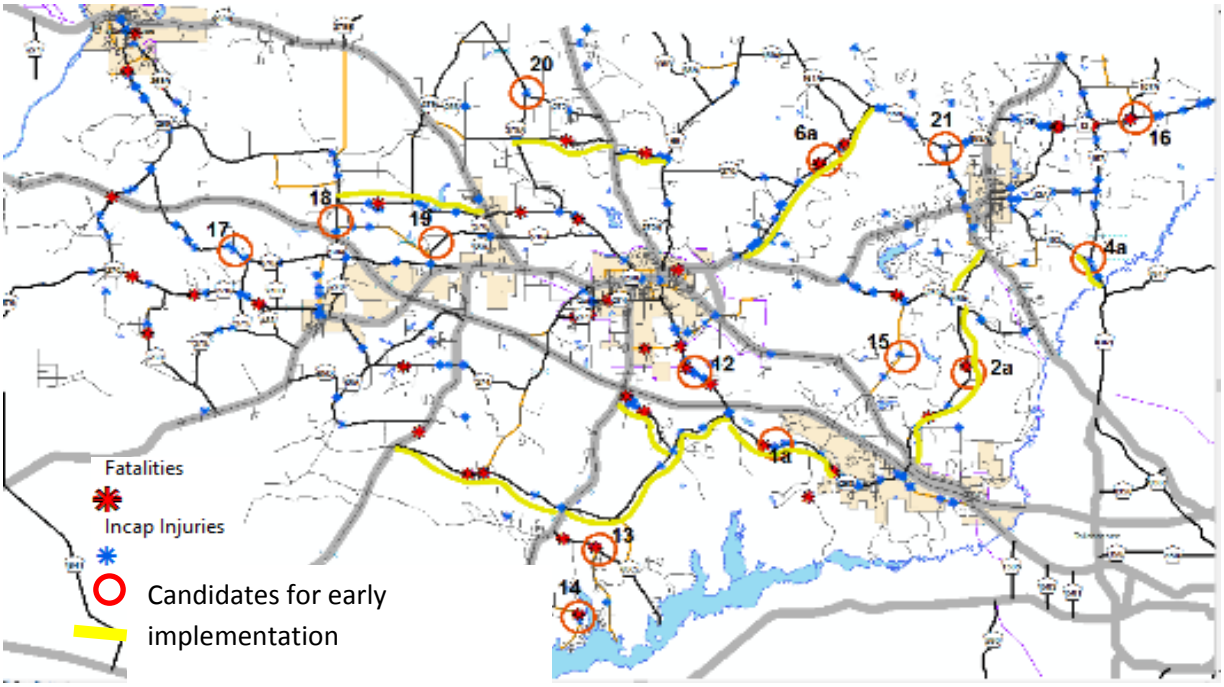


Figure 1 Potential sites for early implementation of improvements

Flashing warning beacons and signing for enhanced conspicuity

Several of the sites identified by this study have a crash history that suggests an elevated level of warning is appropriate. At some of the study sites, changes in the road alignment are obscured by the vertical or horizontal geometry of the road, and severe crashes have occurred. Placement of flashing warning beacons (MUTCD 4L.03) in advance of the change in alignment (vertical or horizontal) is recommended at the sites listed in Table 1. Placement and design of countermeasures are approximate and shown for concept. Detailed review of field conditions and criteria should be made before installing these features.

Following discussions with FDOT District 3 and Gadsden County, FDOT has arranged to provide solar powered flashing beacon units to Gadsden County to be installed by County forces on poles furnished by the County.

Table 1 Sites for installation of flashing beacons

Site number	Site	Crashes	Risk Conditions to correct	Recommended Countermeasures	Comments
1a	High Bridge Road at Little River Crossing	Fatality and incapacitating injuries	Sharp curve at each bridge approach	Install 2 flashing beacons - in advance of curves at each bridge approach	Additional improvements recommended for HSIP
		Most crashes at night	Bridge near end of curves		
2a	Dover Road at Double Creek Crossing	Fatality	Reverse curve at northbound bridge approach	Install flashing beacon and warning sign northbound in advance of curve	Additional improvements recommended for HSIP
		Most crashes at night	Bridge near end of curve with unprotected slope		
			Visual trap northbound		
4a	Concord Road at Iron Bridge Road	Large number of crashes – failure to stop at intersection	Hill restricts view of intersection for southbound traffic	Install flashing beacon and warning sign on Concord Road southbound at top of hill in advance of intersection	Additional improvements recommended for HSIP
		Most crashes at night	Long tangent and downhill grade on southbound approach.	Realign end of road signage for Concord Road	
			Intersection angle: 45 degrees		
6a.	PT Milligan Road (CR 161)	2 fatalities	Reverse curve at southbound bridge approach	Install flashing beacon and warning sign southbound in advance of reverse curve at bridge approach	Additional improvements recommended for HSIP
		Most crashes at night	Bridge near end of curve with obsolete guardrail		
			Visual trap southbound		
12	High Bridge Road north of I-10	2 fatalities	Two curves with restrictive radius	Add flashing beacon at existing curve warning sign southbound at northern most curve	
		4 incapacitating injuries			

Sites candidate for improvement using FDOT's "Push Button" Contract

FDOT's "Push Button" contracting process provides a mechanism for quick implementation of simple projects that require little or no design or other complex preconstruction activities. Projects implemented using this process can be qualified for federal HSIP funding. Installation of signs and pavement markings represent candidate projects for the use of such contracting processes.

Cost estimates are based on the following assumptions:

- All signs and markings will be replaced at each site. (Inspection of the site may show that some of these elements are in serviceable condition and do not require replacement.)
- Vertical retroreflective strips ("bright sticks") will be added to all warning and stop signs to provide enhanced conspicuity per MUTCD.
- Pavement marking upgrades include:
    - Center lines – Thermoplastic with Raised Pavement Markers
    - Edge lines –
        - Thermoplastic stripe
        - Ground in place rumble stripes (except where sites where noise is a problem).
    - Rumble strips on approaches to stop controlled intersection approaches (except where sites where noise is a problem).

Additional site inspections should be made to determine the exact scope of the improvement for each location.

Table 2 lists sites that the study team identified as candidates for implementation using FDOT's "Push Button" contracting process. Five of these sites are discussed in Supplement 1 as components of larger projects identified as candidates for funding in FDOT's Five Year Work program. If these larger projects are not included in the Work Program, the pavement markinig and signing components identified in Table 2 could be implemented using the "Push Button" contracting mechanism.

Table 2 Sites for installation of chevrons, warning signs, pavement markings, and delineators

Site number	Site	Serious Crashes	Risk Conditions to correct	Recommended Countermeasures	Estimated Cost	B/C
12	High Bridge Road north of I-10	2 fatalities	Reverse Curves - tight radius	Add chevrons through curves		
		4 incapacitating injuries	Limited shoulder	Upgrade pavement markings through curves		
13		1 fatality	Reverse curve at intersection	Add chevrons at westernmost curve		
	McCall Bridge Road (CR 65C)	1 incapacitating injury	Visual trap westbound	Upgrade pavement markings through curves		
		Serious crashes in non-daylight conditions		Upgrade intersection warnings	$ 280,063	17.9
		1 fatality		Add Chevrons		
14	Cooks Landing Road	2 incapacitating injury crashes	Sharp curve; poor nighttme visibilioty	Upgrade all pavement markings at curves		
		All crashes in non-daylight conditions				
15	Lanier Road	Concentration of minor crashes at curve	Sharp curve with guardrail	Add chevrons for southbound and extend chevrons for northbound		
17	CR 270 A	2 incapacitating injuries	Curve with visual trap westbound	Add chevrons through curve		
Potential early implementation of countermeasures identified in Supplement 1						
6	PT Milligan Road - CR 161	See analysis in Supplement 1		Upgrade Signs and Markings	$79,259	31.32
7	Old Philadelphia Church Road	See analysis in Supplement 1		Signs, Markings, and Evaluation	$10,040	38.98
8	Shade Farm Road	See analysis in Supplement 1		Upgrade Pavement Markings	$11,694	94.09
9	Spooner Road	See analysis in Supplement 1		Upgrade Pavement Markings	$21,949	5.46
11	Old Federal - Cane Creek	See analysis in Supplement 1		Upgrade Signs and Marking	$21,635	44.92

Improvements suggested for implementation by Gadsden County

Gadsden County has capacity to implement some of the minor countermeasures with county forces.

Table 3 lists several sites where implementation by Gadsden County work forces is suggested. Some of these improvements have already been made by County personnel.

Table 3 Countermeasures for action by Gadsden County

Site number	*Site*	*Serious Crashes*	*Risk Conditions to correct*	*Recommended Countermeasures*	*Comments*
16	Fairbanks Ferry Road at CR 157A	1 fatality	Limited visibility of curve for westbound traffic.	Add chevrons along north side of road through curve.	
		Lane departures associated with curve	marking/warning for intersection	Upgrade intersection warning/marking signs on Fairbanks Ferry Road	
		Most crashes in non-daylight conditions		Consider reducing speed limit at curve	Will require County decision on speed limit
18	Cochran Road	Lane departure crashes in vicinity	Steep unprotected slope near roadway	Add warning sign and delineators	This is an example of condition common throughout area.
19	Bassett Road	Lane departure crashes in vicinity; mostly in non-daylight hours	Headwall without guardrail near road	Add delineators	This is an example of condition common throughout area.
20	Hutchinson Ferry Road/Gloria Road	No serious crashes reported, but potential for crashes	Intersection not well delineated	Upgrade intersection signs on all appproaches	
21	Shortcut Road at CR 159/159A	Potential exists for head-on crashes; No serious crashes reported to date	Traffic control signs for southbound traffic cannot be readily seen until the vehicle is very near the intersection;	Add stop sign on left side of road	
Potential early implementation of countermeasures identified in Supplement 1					
9	Spooner Road	See analysis in Supplement 1		Adjust / upgrade signs	Adjustment of speeds will require County action
	Note:				
	Detailed review of field conditions may show that some existing signs are servicable and do not require replacement.				

Appendix A: Recommended site improvements

Site 1a High Bridge Road at Little River

Recommendations:

- **Add Flashing beacon ahead of curves on each approach to the bridge at Little River.**

Figure 2 Site 1a High Bridge Road at Little River – recommended flashing beacons

Site 2a. Dover Road at Double Creek

Recommendations:

- **Add Flashing beacon ahead of curve on northbound approach to the bridge at Double Creek.**

Figure 3 Site 2a. Dover Road at Double Creek – recommended flashing beacon

Site 4a. Concord Road (CR 153) at intersection with Iron Bridge Road (CR 157)

Recommendations:

- **Add Flashing beacon at top of hill for southbound approach to intersection.**

Figure 4 Site 4a. Concord Road (CR 153) at intersection with Iron Bridge Road (CR 157) - recommended flashing beacon

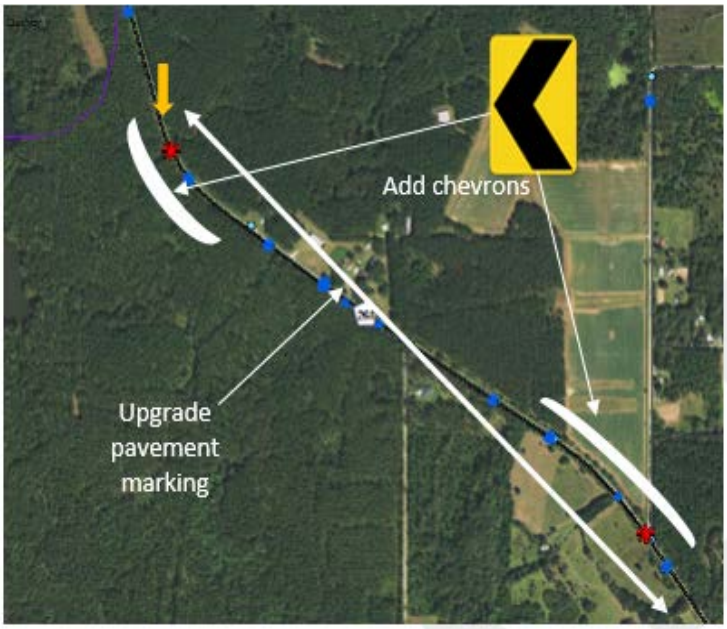
Site 6. PT Milligan Road (CR 161) – bridge approach

Recommendations:

- **Add Flashing beacon for southbound approach to bridge ahead of reverse curve**

Figure 5 Site 6. PT Milligan Road (CR 161) bridge approach – recommended flashing beacon

Site 12. High Bridge Road (CR 268) North of I-10



Recommendations:

- **Add Flashing beacon southbound at advanced warnings sign (Figure 7).**
- **Install chevrons at two curves.**
- **Upgrade pavement markings through curves.**

Figure 6 Site 12. High Bridge Road (CR 268) North of I-10

Figure 7 Existing curve warning sign(southbound) on High Bridge Road north of I – 10

Site 13. McCall Bridge Road (CR 65C) at Lakeview Point Road

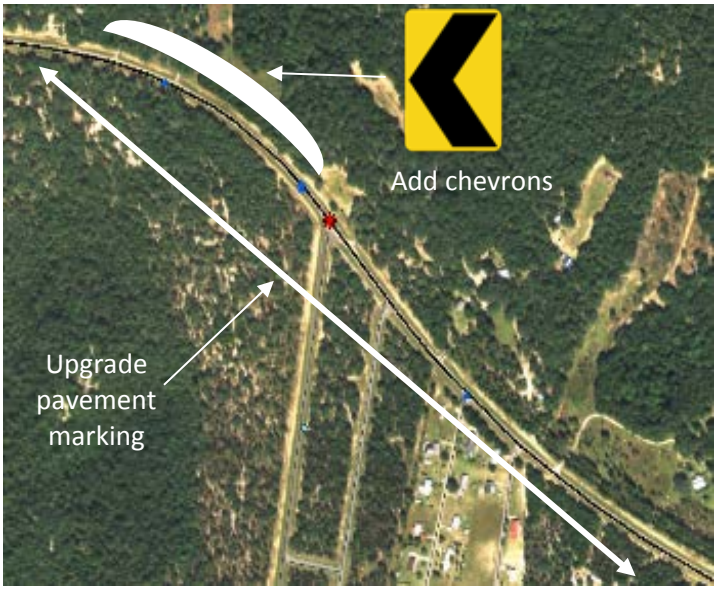


Figure 8 McCall Bridge Road (CR 65C) at Lakeview Point Road

Recommendations:

- **Add chevrons and advanced warning signs for curve and intersection on McCall Bridge Road.**
- **Upgrade pavement markings through curve.**
- **Add/upgrade advanced warning (stop ahead) sign on Lakeview Point Road.**
- **Add supplemental stop sign on left side of Lakeview Pointe. Verify that end of road signage is aligned for good visibility from Lakeview Point Road.**

Figure 9 Lakeview Point Road at intersection with McCall Bridge Road

Site 14. Cook's Landing Road

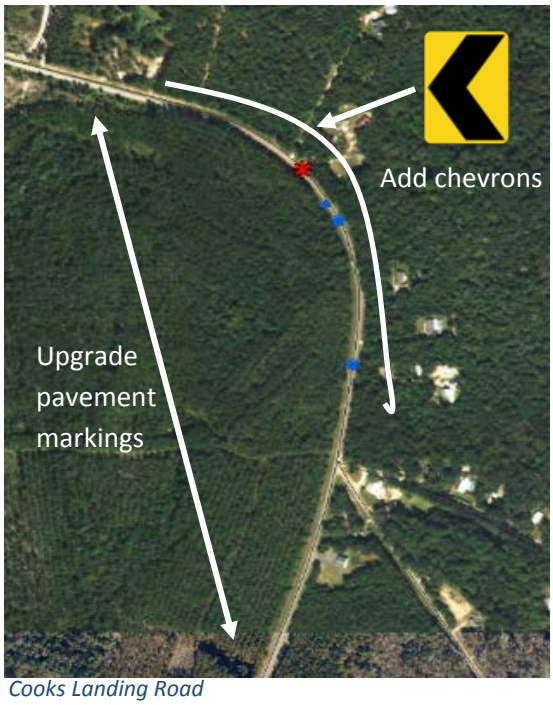


Figure 10 Cooks Landing Road

Multiple crashes at curve, including one fatality, two incapacitating injuries

Crashes in non-daylight hours

Recommendations:

- **Install chevrons throughout the curve**
- **Upgrade pavement markings through the curve**

Figure 11 Cooks Landing Road (northbound approach to curve)

Site 15. Lanier Road – US 90 to Shady Rest Road

Figure 12 Lanier Road – curve in vicinity of Small Farm Road

Recommendations:

- **Install chevrons southbound**
- **Extend chevrons northbound**

Figure 13 Lanier Road northbound at curve – (chevrons marking curve)

Figure 14 Lanier Road – southbound at curve (no chevrons marking curve)

Site16. Fairbanks Ferry at CR 157A

Figure 15 Fairbanks Ferry Road (CR12) at CR 157A

Figure 16 Westbound approach to CR 157A from Fairbanks Ferry Road

Recommendations

- **Add advanced warning sign and intersection sign.**
- **Add chevrons on north side of road.**
- **Consider extending 45 mph speed limit east to include curve at intersection.**

Site 17. Flat Creek Road (CR 270A)

Figure 17 Flat Creek Road (CR 270A) I-10 to CR 379

Recommendations:

- **Add chevrons at the curve**

Figure 18 Curve on Flat Creek Road with visual trap westbound

Site18. Cochran Road (CR 268A) – steep unprotected slopes

Figure 19 Cochran Road (CR 268A)

Recommendations- (immediate):

W8-23

- **Add warning signs**
- **This may be supplemented with delineators if the condition is especially severe**

Recommendations – (future):

- **Add guardrail**

Figure 20 Steep slope near pavement – condition typical throughout area

Site 19. Bassett Road (CR 270/CR 65A)

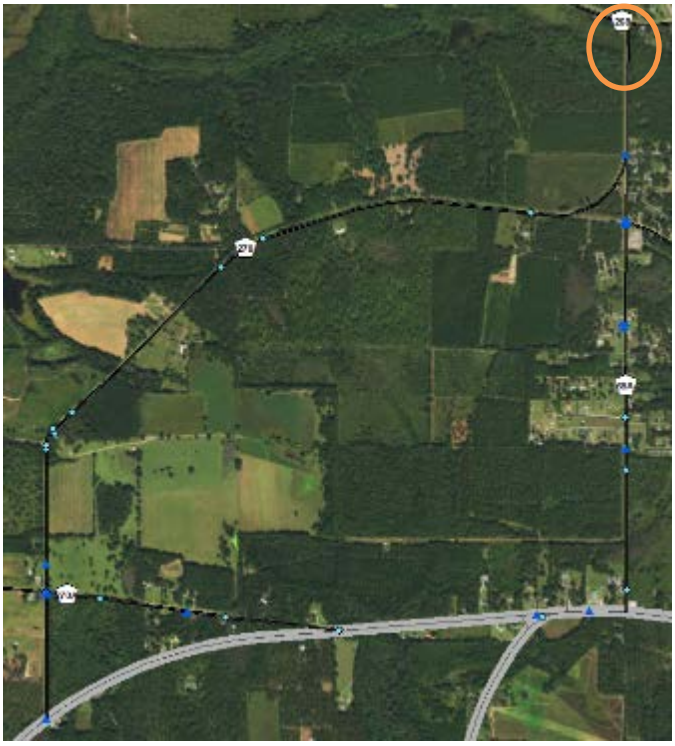


Figure 21 Bassett Road (CR 270/CR 65A) I-10 to Hardaway Highway

Figure 22 Typical unprotected culvert headwall near edge of pavement

Recommendations- (immediate):

- **Install OM3-R object markers where headwalls are very near edge of pavement. This may be supplemented by delineators along the culvert.**

OM3-R

- **Warning signs where shoulders are very narrow for a significant distance on either side of the headwall, install W8-23 warnings**

W8-23

Recommendation – (future):

- **Add guardrail**

Site 20. Hutchinson Ferry Road/Glory Road (CF 270A & CR379)

Recommendations-

- **Add end of road signage**
- **Add advanced warning signs on all approaches to intersection; use combination curve/intersection signs as appropriate.**

Figure 23 Hutchinson Ferry Road intersection with Glory Road

Figure 24 View from westbound Hutchinson Ferry Road at Glory Road

Site 21. "Shortcut Road" at CR 159/CR 159A

Recommendations- (immediate):

- **Add stop sign on left side of road**

Recommendation – (future):

- **Realign CR 159A to intersect with CR 159 at approximately 90 degrees**

Figure 25 "Shortcut Road" at CR 159 and CR 159A

Figure 26 Southbound approach to CR 159

Appendix B: Benefit/Cost analysis

Sites 12, 13, 14, 15, 17

B/C Analaysis for Candidates for FDOT Push Button Contract									
#	Countermeasures for Cost Calculations	Quantity	FDOT Item	Unit	Unit Cost	Total Cost	Life Span	Annuity Factor	Annualized Cost
1	Signs - Single Post Sign <12 SF	71	0700 1 11	AS	314	$22,301			$4,254
2	Edgeline - Thermopl,Std,Yellow,Dot / Guide, 6"	3.8	0711 11241	GM	1831	$6,960			$559
3	Centerline - Thermopl, Std, White, Dot Guide, 6"	3.8	0711 11141	GM	1623	$6,166			$495
4	Signs - Single Post Sign <12 SF	9	0700 1 11	AS	314	$2,827	6	5.24	$539
5	Centerline Rumble Strips - Ground S 16"	1.9	0546 72 52	GM	866	$1,645			$314
6	Edgeline Rumble Strips - Ground S8 8"	3.8	0546 72 53	GM	832	$3,160			$603
7	Bright Sticks - Retroreflective Sign Strips - 5'	77	0700 13 15	EA	107	$8,239			$1,572
				Subtotal	$51,297				$9,606
				Mobilization	10%	$ 5,130			$961
				MOT	10%	$ 5,130			$961
				CEI	15%	$ 7,695			$1,441
				Eng. & Contingencies	25%	$ 12,824			$2,401
				Total		$ 82,076		$15,369	

Annual Benefit in	Annualized cost	B/C Ratio
$280,063	$15,657	**17.9**

See *Supplement 1 – Site Analysis and Recommendations* for B/C analysis for sites 6, 7, 8, 9, 11