



Section E

SAFETY ANALYSIS



1. Introduction

The following section investigates the Talbot County roadway system focusing on safety characteristics. The available accident history and the existing conditions along County maintained roadways were examined to note safety deficiencies, and strategies are discussed to enhance roadway safety.

2. Accidents

Accident data for Talbot County was requested and provided by SHA and Talbot County for the study years of 2002 through 2004. Intersection and corridor accident data was divided and extracted from the database; and the significant results are summarized in **Table 36** and details are found in **Appendix A5 – 2002-2004 Accident Data**.

Table 36 – Accident Summary Notable Trends (2002-2004)

Accidents/Year		2002		2003		2004	
		Accidents	Percent	Accidents	Percent	Accidents	Percent
Total Accidents	Total	507		581		535	
	County Roads	86	17.0%	113	19.4%	113	21.1%
	State Roads	219	43.2%	280	48.2%	220	41.1%
	Municipal Roads	202	39.8%	188	32.4%	202	37.8%
County Roads	Intersection Related	11	12.8%	9	8.0%	16	14.2%
	Corridor Related	69	80.2%	95	84.1%	88	77.9%
	Driveway Related	6	7.0%	9	8.0%	9	8.0%
State Roads	Intersection Related	52	23.7%	68	24.3%	45	20.5%
	Corridor Related	154	70.3%	202	72.1%	171	77.7%
	Driveway Related	13	5.9%	10	3.6%	4	1.8%
Municipal Roads	Intersection Related	84	41.6%	84	44.7%	94	46.5%
	Corridor Related	86	42.6%	80	42.6%	82	40.6%
	Driveway Related	32	15.8%	24	12.8%	26	12.9%

The corridor-related accident data was further analyzed; and the significant results are summarized in **Table 37** and details are found in **Appendix A5 – 2002-2004 Accident Data**.



Table 37 – Corridor Accident Summary Notable Trends (2002-2004)

Accidents/Year		2002		2003		2004	
		Accidents	Percent	Accidents	Percent	Accidents	Percent
Corridor Accidents	Total	309		377		341	
	County Roads	69	13.6%	95	16.4%	88	16.4%
	State Roads	154	30.4%	202	34.8%	171	32.0%
	Municipal Roads	86	17.0%	80	13.8%	82	15.3%
County Roads	Single Vehicle Fixed Object	58	84.1%	84	88.4%	77	87.5%
	Angle, Left Turn, Opposite Direction, Rear End	3	4.3%	3	3.2%	4	4.5%
	Other	8	11.6%	8	8.4%	7	8.0%
State Roads	Single Vehicle Fixed Object	118	76.6%	148	73.3%	121	70.8%
	Angle, Left Turn, Opposite Direction, Rear End	24	15.6%	44	21.8%	36	21.1%
	Other	12	7.8%	10	5.0%	14	8.2%
Municipal Roads	Single Vehicle Fixed Object	28	32.6%	23	28.8%	18	22.0%
	Angle, Left Turn, Opposite Direction, Rear End	28	32.6%	20	25.0%	25	30.5%
	Other	30	34.9%	37	46.3%	39	47.6%

The total number of reported accidents increased in 2003 (from 2002 levels), and showed a drop in 2004. The number of intersection related accidents has dropped since 2002, which indicates the higher volumes have not affected the amount of intersection accidents. The rate of severe accidents stayed consistent within the past three years. The numbers of corridor accidents is significantly higher than intersection accidents, which indicates that roadway and roadside characteristics are factors in the cause of many accidents.

Single vehicle fixed object accidents are the most frequent collision types, which indicates conflicts between the clear zone widths and travel ways. The most frequent type of fixed objects struck are culverts and ditches. Rear end and angle collision types also occurred at a noticeable rate, which are caused by improper driver behavior.

Failure to give full attention caused many of the accidents, which indicates driver awareness behavioral problems. Excessive speeds and under the influence of alcohol also occurred at a noticeable rate, which are also driver behavioral deficiencies.

Table 38 lists County roadways that have significant accident frequencies (5 or more accidents in a year from 2002 to 2004), and it is recommended to prioritize these roadways for safety mitigation improvements.



Table 38 – County Roadways with Significant Accident Frequencies (2002-2004)

Roadway		Year			Total
County No.	Name	2002	2003	2004	
14	Chapel Road	6	10	14	30
28	Black Dog Alley	9	8	9	26
96	Dover Neck Road	4	4	10	18
37	Glebe Road	3	10	3	16
95	Dutchman's Lane	0	7	4	11
280	Manadier Road	3	3	5	11
101	Landing Neck Road	5	2	2	9
3	Skipton Cordova Road	2	5	1	8
290	Barber Road	1	0	6	7

3. Roadway Conditions

Many physical roadway characteristics contribute to unsafe conditions along the County roads. **Appendix B6 – County Roadway Inventory** details a roadway inventory of existing conditions that highlight the deficiencies along County roadways (roadways 1.5 miles or more in length). The conditions that are considered deficient include:

- Lane widths less than 10 feet
- Shoulder widths less than 2 feet
- Side slopes and ditches next to the roadway with slopes steeper than 4:1 (slope grade is considered traversable and recoverable) and clear zone obstructions less than 7 feet
- Lack of a double yellow center line and faded pavement markings
- Non-paved roadways and pavement conditions with significant cracking, rutting, and potholes

Table 39 displays a prioritized list of safety deficient County roadways. Roadways in bold represent roadways found in **Table 38** in the previous section. Landing Neck Road has deficient lane widths; Chapel Road, Manadier Road, and Dutchman's Lanes have stretches of deficient clear zone width; and Glebe Road has stretches without pavement markings. Glebe Road also has clear zone/ditch issues.



Table 39 – Deficient Safety Conditions County Roadways

Rank	County No.	Name	Lane Width (ft)	Clear Zone Offset (ft)	Pavement Markings
1	108	DEEP BRANCH RD	7	6-8	NONE
2	117	CLARKS WHARF RD	7.5	5	NONE
3	114	SCHOOL HOUSE RD	7.5	2-5	NONE
4	273	PROBASCO LNDG RD	7.5	3-5	NONE
5	69	MT PLEASANT RD	7.5	3-5	NONE
6	47	COPPERVILLE RD	7.5	4-6	NONE
7	198	PRESQUILE DR S	7.5	4-7	NONE
8	20	CEDAR POINT RD	8	3	NONE
9	23	MILLER RD	8	3-4	NONE
10	288	PINEY HILL RD	8	4-7	NONE
11	289	JAMAICA POINT RD	8	5-15	NONE
12	406	PRESQUILE DR N	8	5-7	NONE
13	16	COVEYS LANDING RD	8.5	5	NONE
14	100	SCHWANINGER RD	9	3	NONE
15	50	MARENGO RD	9	3	NONE
16	83	MACKS LA	9	3	NONE
17	285	LLANDAFF RD	9	3	NONE
18	102	BAILEYS NECK RD	9	4	NONE
19	53	COUNCELL RD	9	4	NONE
20	275	REESES LANDING RD	9	4	NONE
21	103	OTWELL RD	9	4	NONE
22	71	DEEP WATER POINT RD	9	4	NONE
23	51	MILES RIVER RD	9	5	NONE
24	46	GREGORY RD	9	6	NONE
25	122	MONEY MAKE RD	9	2-5	NONE
26	121	CHANCELLOR POINT RD	9	4-6	NONE
27	2	CONNOLLY RD	9	4-9	NONE
28	8	CHURCH LA	9	5-6	NONE
29	279	BRUFFS ISLAND RD	9.5	3	NONE
30	418	MT PLEASANT LANDING CIR	9.5	6-14	NONE
31	57	FERRY NECK RD	8.5	3	DBL YLW
32	6	NEWTOWN RD	8.5	5-7	DBL YLW
33	260	SAILORS RETREAT RD	9	5	DBL YLW
34	111	ISLAND CREEK RD	9	5-11	DBL YLW
35	107	LLOYDS LANDING RD	8	7-11	NONE
36	104	EVERGREEN RD	8.5	7-10	NONE
37	48	FORREST LNDG RD	8.5	7-11	NONE
38	124	HOWELL POINT RD	9	9-11	NONE
39	136	SOUTHSIDE ISLAND CREEK RD	9.5	9	NONE
40	1	BLADES RD E	9.5	7-10	NONE
41	4	OLD CORDOVA RD	9.5	8-10	NONE



Rank	County No.	Name	Lane Width (ft)	Clear Zone Offset (ft)	Pavement Markings
42	109	BRUCEVILLE RD	8.5	8	DBL YLW/WT SHLDR
43	120	BEAVER DAM RD	9	8	DBL YLW
44	101	LANDING NECK RD	9.5	12	DBL YLW
45	85	POT PIE RD	10	3	NONE
46	106	WHITE MARSH RD	10	5	NONE
47	189	WORLD FARM RD	10	5	NONE
48	21	GEIB RD	10	6	NONE
49	277	AIRPORT RD	10	4-13	NONE
50	18	PLUGGE RD	10	6-8	NONE
51	73	QUAKER NECK RD	10.5	5	NONE
52	76	COOPER POINT RD	10.5	3-15	NONE
53	66	PEA NECK RD	10.5	6-9	NONE
54	84	NEW RD	11	5	NONE
55	49	TUNIS MILLS RD	10	3	DBL YLW
56	38	VILLA RD	10	4	DBL YLW
57	41	SHARP RD	10	5	DBL YLW/NONE
58	14	CHAPEL RD	10-11	6-17	DBL YLW
59	45	UNIONVILLE RD	10	3-8	DBL YLW
60	276	MULLET BRANCH RD	10	4-5	DBL YLW
61	58	DEEP NECK RD	10	6-9	DBL YLW
62	280	MANADIER RD	10.5	6	DBL YLW
63	11	WYE LNDG LA	10.5	5-12	DBL YLW
64	93	WAVERLY RD	10.5	5-12	DBL YLW
65	282	ALMSHOUSE RD	11	6	DBL YLW
66	95	DUTCHMANS LA	12	5-7	DBL YLW
67	26	RABBIT HILL RD	12	6-15	DBL YLW
68	159	BLACK WALNUT POINT RD	10-13	6	DBL YLW/WT SHLDR
69	54	HOPKINS NECK RD	10	7	NONE
70	37	GLEBE RD	10	8	NONE
71	287	CHLORAS POINT RD	10	8	NONE
72	25	GANNON RD	10	8	NONE
73	362	PRESQUILE RD	10	10	NONE
74	68	CHURCH NECK RD	10	7-9	NONE
75	400	BLADES RD	10	8-12	NONE
76	376	BRICK ROW DR	10.5	10	NONE
77	286	TARBUTTON MILL RD	10.5	10-19	NONE
78	294	BANTRY RD	11	8-10	NONE

4. Roadway Standards

The current County roadway design standards exhibit typical road sections that incorporate dated roadside design guidelines for safety. The sections use 3:1 foreslopes for ditches 1-1/2



feet in depth, which are considered traversable but not recoverable according to the 2002 *AASHTO Roadside Design Guide*. Foreslopes 4:1 are acceptable and 6:1 are desirable. Available right-of-way constrains certain classifications of roadway. The current and recommended roadway standards can be found in **Appendix B10 – Existing Standard Details and Recommended Typical Sections**.

Many existing County roadways were built prior to the current standards, therefore they do not adhere to the guidelines. The roadway width in the design standards utilizes a minimum paved section of 32 feet, which is the ideal width for bicycle compatibility along open-section roadways. Most County roads do not reach the minimum pavement width. Also most County roads do not include a ditch section that is adequate for the current design standard. Local neighborhoods have voiced concerns with these substandard conditions (Macks Lane in McDaniel and Deep Water Point Road in St. Michaels to name a few). Because it would be economically unfeasible to upgrade existing roads to current standards and the low volumes experienced on the local roadways, it is recommended to enforce the County standards for all new roads and existing roads slated for improvement in the County.

5. Intersection Safety

Sight distance is a major safety concern for intersections. Intersection and stopping sight distances describe the level of visibility for drivers approaching an intersection. Deficient sight distances are created by obstructions to the sightlines that cause unsafe conditions, because they impede driver reaction and decision timing. *Talbot County Roadway and Storm Drainage Design & Construction Standards* directs that intersection corners should be kept free from obstacles for a distance of 300 feet in all directions. AASHTO's *A Policy on Geometric Design of Highways and Streets* describes required stopping sight distances, intersection sight distances for left turn vehicles from stop, and intersection sight distances for right turning and crossing vehicles from stopped condition based on roadway design speed. It is recommended to inspect the intersections found along County roadways for their compliance to these design criteria.

Intersection lighting is another component to safety of intersections. While all signalized intersections in Talbot County provide adequate lighting, most unsignalized intersections do not. In the rural areas of the County, the infrastructure for intersection lighting does not exist; and it would be unfeasible to justify adding this infrastructure as a consistent improvement for intersection safety.

6. Bicycle Accessibility

SHA provides guidelines for bicycle accessible roadway routes. Bicycle routes along roadways with closed drainage systems should have a minimum outer lane width of 15 feet (11 foot travel lane and 4 foot bike lane), or a minimum outer lane width of 16 feet (11 foot travel lane and 5 foot bike lane) if the roadway experiences significant bicycle usage and vehicular travel speed exceeds 40 mph. Bicycle routes along roadways with open drainage systems should provide a shoulder with a minimum width of 4 feet. The SHA guidelines also provide pavement marking recommendations for bicycle facilities along roadways and intersections.



The *Talbot County Comprehensive Plan* provides locations of existing popular routes and potential bike routes. The existing popular bike routes include:

- MD 33
- MD 579
- MD 329
- Bellevue Road
- MD 333

Potential bike routes include:

- MD 328
- MD 370/Unionville Road
- MD 662
- Airport Road
- Almshouse Road
- Barber Road
- Black Dog Alley
- Bruceville Road
- Chapel Road
- Dutchman's Lane
- Glebe Road
- Goldsborough Neck Road
- Landing Neck Road
- Lewistown Road
- Manadier Road
- Sharp Road
- Skipton Cordova Road
- Tappers Corner Road
- Todds Corner Road
- Tree Bridge Branch Road
- White Marsh Road
- Windy Hill Road

MD 329 and all of the County roads mentioned above fail to meet the SHA or AASHTO guidelines for accessible bicycle routes, because they do not provide adequate roadway width. The County should consider improving these roadways with more compatible designs for bicycle accessibility.

7. Safety Improvements

Improvements that address safety concerns and deficiencies bring opportunity to reduce accidents along corridors and intersections. **Table 40** lists methods used to address safety based on improvements to the roadway, driver awareness, and driver behavior. Roadside design improvements should be addressed to the existing County roadways during regular roadway maintenance procedures. With the increased presence of older drivers within Talbot County, the suggested improvements from **Table 40** for older drivers should also be carefully considered when roadway or intersection projects are planned.

8. Emergency Vehicles

The access and safety of emergency vehicles is a concern within the County. The hospital is located in Easton, where east and west access becomes very difficult with traffic during summer months. Local police and fire departments are found in Easton, Tilghman, St. Michaels, Oxford, Trappe, Cordova, Queen Annes, and Wye Mills. Many of the local roads are too narrow and the roadside conditions are not safe to negotiate an emergency vehicle to pass vehicles during emergency responses. Measures should be taken to ensure efficient response time and access



for emergency vehicles around the towns within the County. Effective roadway improvements include providing shoulders and recoverable roadside clear zones.

9. Evacuation Routes

The western peninsula and shores of Talbot County are vulnerable to the effects of potential natural disasters. The major evacuation routes include:

- US 50
- MD 322
- MD 33
- MD 333.

The Minor evacuation routes include:

- Bellevue Road
- Black Walnut Point Road
- Deep Neck Road
- Glebe Road
- Sharp Road
- Todd's Corner Road
- Tunis Mills Road

Talbot County Department of Planning is finalizing their report on flood surges, which identifies the locations prone to flooding based on the severity of weather related incidences. In addition to analyzing the capacity requirements needed during an evacuation, the topographic conditions of these evacuation routes should also be analyzed to make sure flooding will not constrain the accessibility of these routes.



Table 40 – Safety Improvement Methods

Improvement Category	Improvement Technique
Roadway Conditions	<ul style="list-style-type: none"> • Patch repair • Resurface • Widen shoulder • Add turn lanes or turn bypass lane • Widen lanes
Roadside Design	<ul style="list-style-type: none"> • Delineate objects within clear zone • Shield objects from motorists within clear zone • Modify clear zone to make more traversable • Widen clear zone by clearing area of objects
Horizontal Curves	<ul style="list-style-type: none"> • Provide enhanced advanced warning • Enhance delineation along the curve • Provide adequate sight distance • Install rumble strips along curve center line and/ or shoulder • Provide skid-resistant pavement • Improve superelevation • Widen the roadway • Modify alignment to flatten curve
Intersections	<ul style="list-style-type: none"> • Improve access management near intersections • Improve intersection and approach sight distances • Improvements geometry by adding turn, bypass, and acceleration lanes at intersection • Improve driver awareness approaching intersections • Provide appropriate traffic control • Improve driver compliance through traffic control and laws • Reduce operating speeds through intersections • Construct roundabouts • Construct grade-separated intersections
Older Driver Involvement	<ul style="list-style-type: none"> • Provide more advanced warning, guide, and street signs • Increase size and lettering height of roadway signs • Provide longer clearance intervals at signalized intersections • Provide more protected left-turn phases at high volume intersections • Provide offset left-turn lanes at intersections • Improve roadway lighting • Improve roadway delineation • Provide more raised channelization
Head-on Collisions	<ul style="list-style-type: none"> • Provide profiled thermoplastic stripes for centerline • Widen roadway cross sections • Provide buffer median area • Provide median barrier • Provide alternating passing lanes