CALVERT COUNTY TRANSPORTATION PLAN

TECHNICAL MEMORANDUM #3
Summary of Existing Conditions

April 2019

SABRA & ASSOCIATES
Engineering Innovative Solutions

Note: This is the second in a series of technical memoranda prepared for the Calvert County Department of Planning & Zoning in developing the Calvert County Transportation Plan. The purpose of each technical memorandum prepared for is to present facts, analysis, ideas, issues and recommendations that will inform the plan. The views expressed, and recommendations offered in each memorandum are solely based on the consultant's judgment and should not be considered as endorsed by the Calvert County Department of Planning & Zoning or any other county department or officer.

Contents

Introduction

Calvert County is a long narrow peninsula bounded by the Potomac River to the west and the Chesapeake Bay to the east and south. One bridge crosses the Potomac River to the west approximately two-thirds of the way south of the northern county boundary; the Thomas Johnson Bridge crosses the Potomac River to the south into St. Mary's County. Prince George's and Anne Arundel Counties abut the northern boundary to the northwest and northeast, respectively. The County's geography dictates the transportation network with MD 2/4 acting as a spine and several state roadways stemming east and west supported by a local network of collectors and minor arterials connecting further to the interior.

Over a thirty-year period beginning in the mid-1980s, Calvert County's population grew by nearly 170% to 97,500 residents. This growth can be attributed to the always strong federal sector in the core of Washington, DC and at Joint Base Andrews, Suitland and New Carrollton among other suburbs, and base realignment to the benefit of Patuxent River Naval Air Station. Newcomers were willing to exchange a longer commute for Calvert County's high quality of life with easy access to the Chesapeake Bay and Patuxent River, low taxes and good schools.

During that time, MDOT's State Highway Administration widened portions of MD 2/4 and worked closely with the County on access management strategies to mitigate some of the stop-and-go traffic. MDOT's Maryland Transit Administration grew its commuter bus ridership and park-and-ride capacity nearly ten-fold. The County also implemented a growth management strategy that preserved rural areas and targeted town centers in Solomons/Lusby, Prince Frederick, Dunkirk and elsewhere for residential and commercial development.

Thirty years after the residential boom started, population growth has stabilized. Projections through 2040 indicate a rate of growth in Calvert County averaging 0.5% annually.[1] While Calvert County's population growth has stabilized, its demographics and commuting patterns are changing rapidly. Baby boom retirements have reduced the number of persons in the workforce, but those who are working are do so with a longer commute to a destination outside of the County.

Key Transportation Characteristics	2009	2016
Workers 16 Years or Older	45431	44872
Drive Alone	90.2%	90.1%
Use Public Transit	3%	3%
No Vehicle in Household	1.0%	1.5%
Work in County of residence	41.1%	38.1%
Average time to work (minutes)	39.3	41.4
Greater than 60 min drive	26.4%	29.0%

Table 1 Transportation Characteristics in Calvert County
Source: American Community Survey

Throughout the building boom, the County was developed in a typical auto-oriented suburban fashion with agricultural, commercial, residential and industrial areas generally separated through zoning practices. Beginning with the ____ comp plan, the county developed a strategy that concentrated growth within town centers as the focal point of residential and commercial development. Still, the predominant mode of transportation in Calvert County is the personal auto. More than 90% of county residents commute to work alone in their personal vehicle; less than 3% percent use public transit. Given the

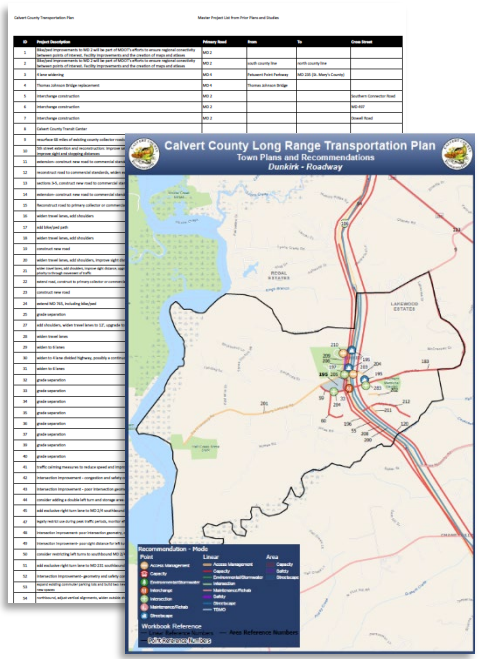
[1] Moving Forward 2040: C-SMMPO Long Range Transportation Plan, Chapter 2.1

development pattern and the distance from major employment centers, there is no evidence that at a countywide scale these modal shares are likely to change; however, it is possible that development policies and transportation investments can shape the town centers with a balanced transportation network in certain corridors and smaller planning areas. The transportation focus of the town center planning is to provide a local road network that keeps trips circulating without needing to use MD 2/4, and to create a pedestrian friendly environment that reduces the need for short-distance auto trips.

This report documents existing demographic, land use and transportation conditions in the county which will be used in support of a countywide transportation master plan. The TMP will act as a bridge between the proposed comprehensive plan and the small area plans for each of the town centers which will implement the comprehensive plan's land use and growth elements. This report also documents how the transportation system is owned and operated and the sources and uses of funds to maintain and expand the multimodal transportation network.

Previous Studies

In preparing the TMP, approximately twenty studies and plans developed since 1999 were reviewed to identify specific transportation improvements and policies proposed within the county. A comprehensive listing of transportation plans and projects identified by local, regional and state agencies for potential implementation in Calvert County was developed. The recommendations of these plans total 284 projects relating to access management, new road capacity, stormwater and drainage, intersection improvements, road maintenance, safety, streetscape, local transit service and transportation systems management and operations strategies. 284 transportation projects ranging from new interchanges along MD 2/4 to sidewalks in each of the town centers; recommendations also include Technical Memorandum #1 provides a summary of all reviewed plans and recommendations.



Partial list and map of transportation projects.

Reviewed plans included transportation planning and policy statutes, transportation planning and budget documents, town center master plans and budgeted improvements. Reviewed documents identified project and policy recommendations.

Roles and Responsibilities

A number of agencies and organizations are responsible for constructing and maintaining roads and bridges, developing and operating transit networks and expanding the bicycle and pedestrian network. The traveling public makes little distinction between these agencies. What matters is that the traveler can drive, ride or walk to their destination in a manner that is safe and reliable. Each of the below described agencies focus on the transportation issues in a different capacity.

Calvert County Department of Public Works

The Calvert County Department of Public Works (DPW) has responsibilities ranging from managing the fleet of government vehicles, water/sewer, solid waste to engineering, construction and maintenance of county owned roads and bridges.

The Highway Maintenance Division oversees the maintenance of more than 900 lane miles of county's road network including drainage improvement, roadside shoulders, guardrails and road signage. This division is responsible for conducting roadway line striping, cutting back roadside landscaping, repairing potholes and litter pick up, in addition to response to all emergency and weather-related situations. The Engineering/Transportation Division develops, coordinates, issues, evaluates and monitors proposals and contracts for highway maintenance and capital projects. The division also reviews residential, institutional and commercial plans for subdivisions, reviews building and grading permits, administers public works agreements including the collection and monitoring of bonds, coordinates road development and storm water management/grading inspections with the Division of Project Management. The department also supervises all road and bridge construction and maintenance projects.

The Division of Project Management and Inspection reviews and approves all grading and utility permit applications for single-family dwellings and institutional, commercial and industrial sites including utility cuts within the county rights of way. The division is also responsible for enforcement of sediment control for single-family lots and inspection of all stormwater management facilities, construction of subdivision streets and all county road-related contracts.

State Highway Administration

The Maryland State Highway Administration (MDOT SHA) is responsible for constructing, operating and maintaining approximately 126 miles of state-owned roadways in Calvert County such as MD 2/4, MD 261 and MD 765 and other numbered roadways. MDOT SHA roads tend to operate at speeds greater than 35 miles per hour and carry traffic through the county and connecting town centers and municipalities. MDOT SHA owns 42 signals in Calvert County. MDOT SHA also maintains two bridges in Calvert County, the MD 261 Benedict Bridge and the MD 4 Thomas Johnson Bridge.

Municipal Agencies and Private Organizations

The towns of North Beach and Chesapeake Beach are responsible for the construction and maintenance of approximately 49.7 lane miles collectively. In addition, homeowners' associations such as those at Chesapeake Ranch Estates and White Sands are responsible for the maintenance of roads within their boundaries.

Calvert County-St Mary's MPO

(C-SMMPO) performs regional transportation planning as required by federal law in a continuing, cooperative, and comprehensive process that involves identifying improvements to facilities and operations. The goal of this process is to provide a well-maintained, multimodal

transportation system that allows for the safe, convenient, affordable, and efficient movement of people, goods, and services. C-SMMPO assists with transportation decision-making, planning and programming amongst federal, state, and local government. The C-SMMPO Council, which comprises one commissioner from Calvert County, one commissioner from St. Mary's County, and one representative from MDOT.

County Roads and Bridges

The core transportation responsibility of any local government is to maintain its assets in a state of good repair. The county owns 541 miles of roadway (approximately 1842 lane miles) of which DPW estimates that 50% is in good condition while the balance is evenly split between fair and poor condition. DPW is currently undertaking a formal roadway condition assessment to inform its annual paving program.

There are two areas of special concern for the county's roads. The implication of these concerns will be addressed in the Transportation Master Plan:

- Fifteen roads carry a historic designation
- More than thirty roads have experienced recent or recurring flooding. The Office of Emergency Management reports that the number of flooded roads is growing with each major storm or tidal event.

DPW is also responsible for maintenance of fifteen bridges owned by the county. All of the bridges are reported to be in good condition as defined by the Federal Highway Administration.

Map 1 shows the road network in Calvert County, including the historic roads and roads with reoccurring flooding.

Roadway Classification

Roadway functional classification defines the role each roadway plays in moving vehicles throughout the network and how roadways relate to adjacent land uses. No expressways or highways exist in the county; instead, MD 2/4 is the principal north-south arterial road. As a principal arterial, it is the County's long-term objective to limit the number of access points in order to maintain traffic flow and safety. In the Solomons/Lusby area an access management strategy resulted in the development of the Southern Connector Boulevard. Several local roads had their access redirected to the Southern Connector rather than directly on to MD 2/4, over the past twenty years there have been multiple proposals for grade-separated interchanges along MD 2/4 which would have the effect of making portions of MD 2/4 into a freeway. None of these proposals have advanced nor do any appear to be warranted.

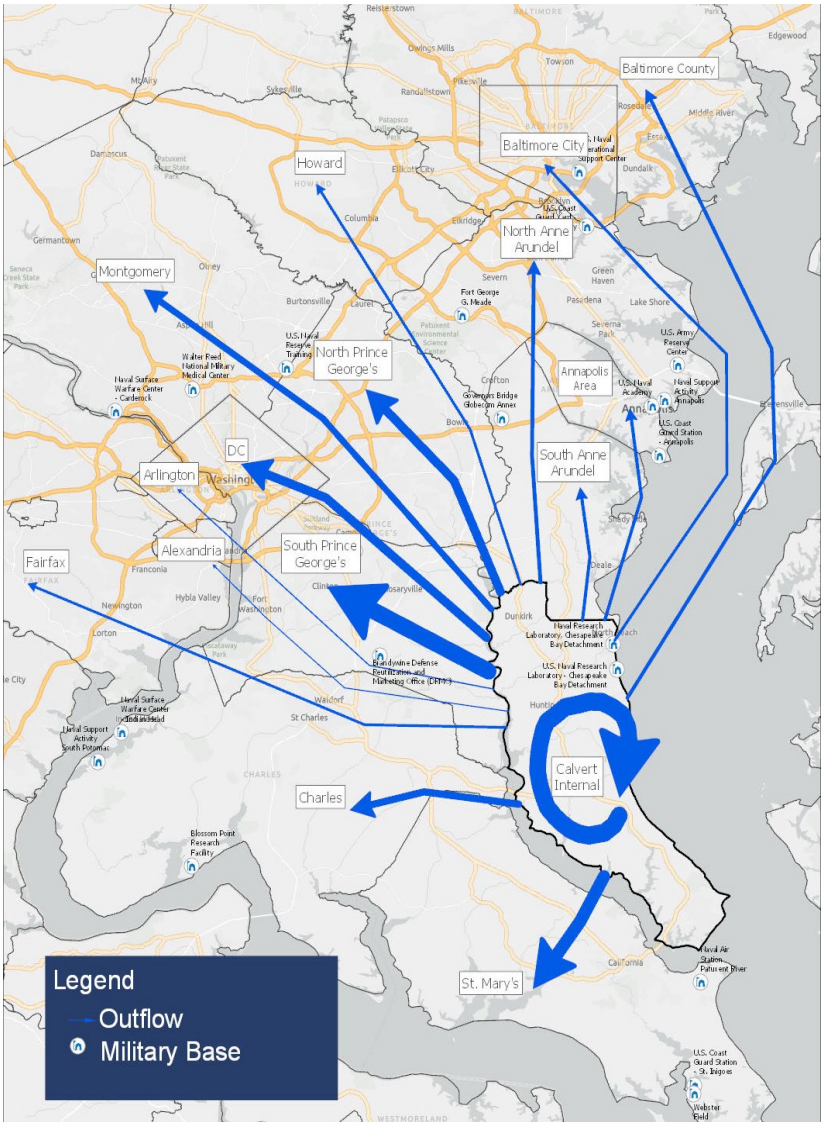
Calvert County has two east-west primary arterial roads, Chesapeake Beach Road connecting Chesapeake Beach to Owings and Hallowing Point Road connecting Prince Frederick Town Center to Charles County. Due to the rural nature of the area, these principal arterials have uncontrolled access with driveways and side streets freely permitted. There does not appear to be any reason to control access on these principal arterials as their functionality is not compromised

All other roadways serve a very localized function and are classified as minor collectors or local streets.

Map 1 Roadway Functional Classifications and Historic and Flooded Roads

Commuting Patterns

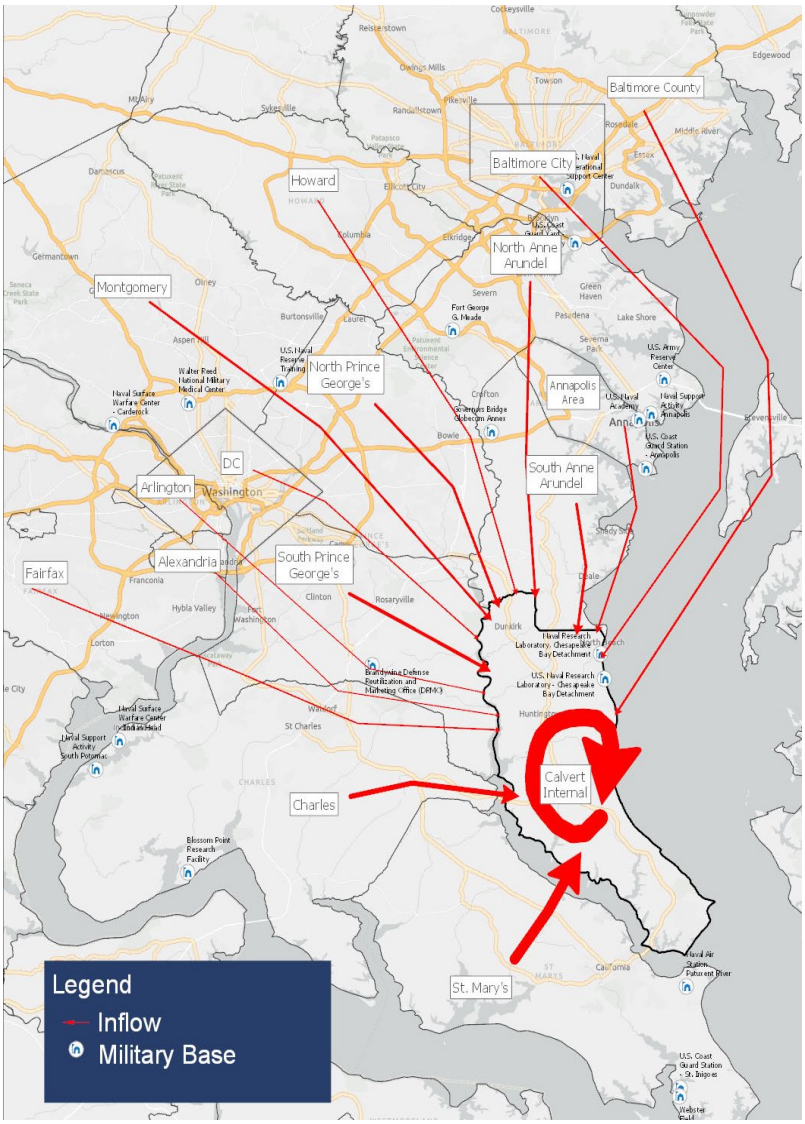
As of July 2018, the Census Bureau estimates that the average commute time for a resident of Calvert County is 42 minutes, by far the longest average commute of any jurisdiction in Maryland. The lack of major employers in Calvert County results in slightly more than 65% of commuting trips destined for locations outside of Calvert County; and this cohort has steadily increased over the past three decades. Military facilities (NSF Indian Head, Joint Base Andrews, NAS Patuxent River), defense agencies and contractors and non-defense federal agencies are the largest employment sector for Calvert County.



Map 2 Outbound Commutes from Calvert County

Destinations	% of Trips
Calvert County	34.7%
Southern Prince George's	11.8%
St. Mary's County	9.3%
Northern Prince George's	6.4%
Washington, D.C.	6.2%
Charles County	4.9%
Montgomery County	4.5%
Baltimore City/ Baltimore County	4.4%
Northern Anne Arundel (BWI/Ft. Meade)	4.4%
Annapolis/Southern Anne Arundel	4.4%
All Other Locations	10.6%

Similarly, due to the lack of major employers, less than 10,000 commuting trips are made into Calvert County each day. Nearly 50% of the trips made into Calvert County are by residents of southern Anne Arundel, Charles, and St. Mary's counties.



Trip Origin	% of Trips
St. Mary's County	28.3%
Charles County	12.3%
Annapolis/ Southern Anne Arundel	8.9%
Southern Prince George's	7.6%
Baltimore City/County	6.3%
Northern Prince George's	5.2%
Northern Anne Arundel (BWI/Ft. Meade)	4.7%
Montgomery County	4.2%
Northern Virginia	2.0%
Howard	1.7%
Washington, D.C.	1.3%
All Other	17.5%

Map 3 Inbound Commutes into Calvert County

Finally, data indicates that MD 2/4 carries a relatively insignificant amount of through traffic from St. Mary's County across the Governor Thomas Johnson Bridge and through to Prince George's or Anne Arundel County. Fewer than 4% of all vehicles make this trip from the southern border through to the northern boundary of the Calvert County. This is indicative of a strong economic relationship between Calvert County and NAS Patuxent River as 96% of all trips using the bridge are between Calvert and St. Mary's Counties.

Traffic Volume Since 2010

Since 2010, traffic volumes there have been significant variations of change in traffic volumes MD 2/4:

- between Huntington (MD 263) and the MD 2/4 split a modest with 1.5% increase in Annual Average Daily Traffic occurred.
- Through Prince Frederick (MD 402 to MD 263), Annual Average Daily Traffic dropped by 14.6% from 48,012 to 40,990. Some of this decline appears to be associated with the opening of Prince Frederick in 2014, carrying just under 3,000 trips per day.
- through Lusby and Solomons (from Coster Road/Mill Bridge Road to Lore Road), traffic increased by 11%[2]

Map 5 indicates 2018 Annual Average Daily Traffic along MD 2/4.

Traffic Speed & Intersection Level of Service

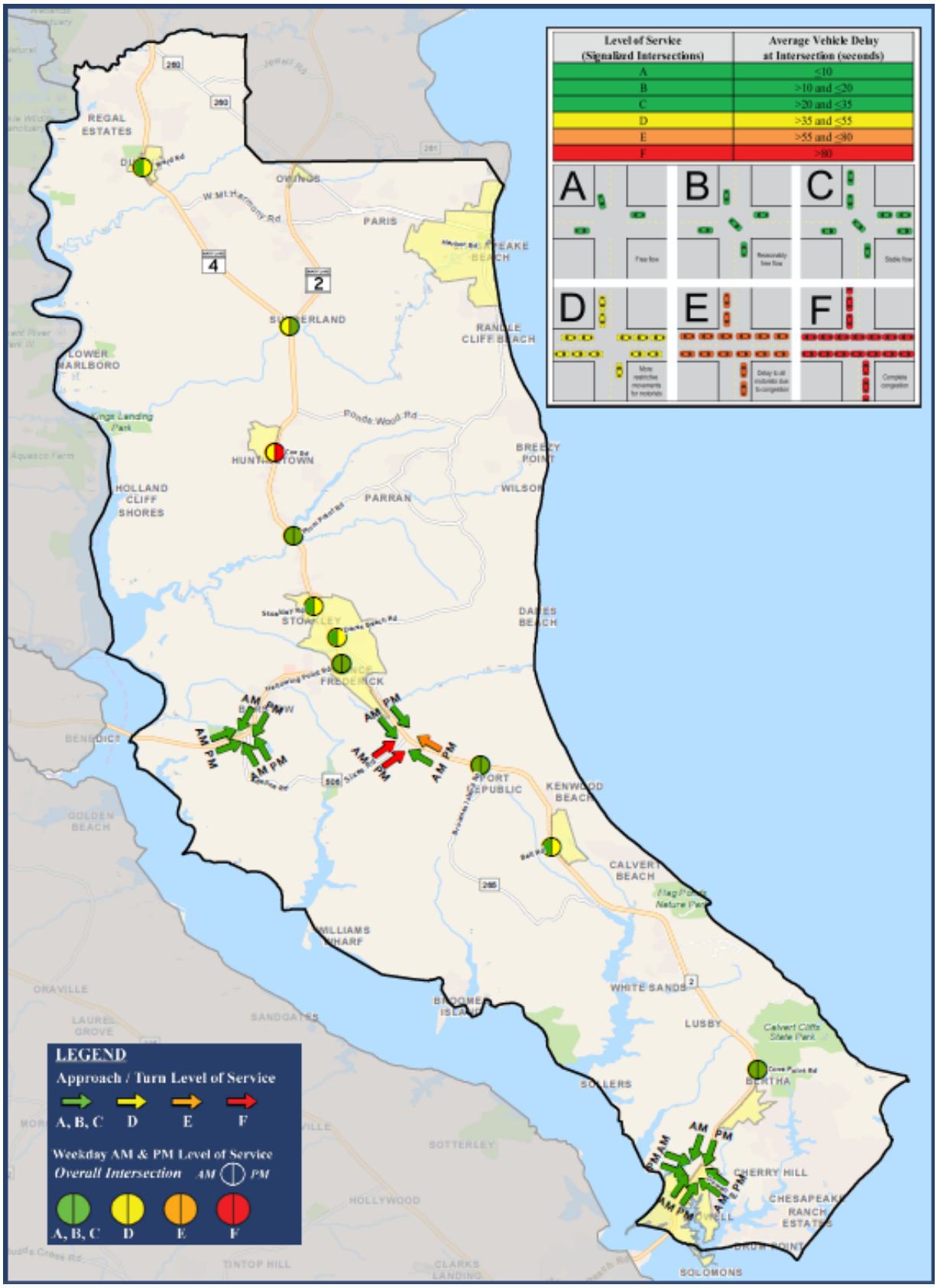
All along the MD 2/4 corridor, morning peak hour traffic hour speed consistently runs at or near the posted speed limit (50/55 mph in rural areas; 45 mph through the town centers). The same conditions occur in the PM peak hour, except through Prince Frederick where average speeds drop to under 30 mph between MD 261 and MD 402. Map 5 depicts the AM and PM average travel speeds in Calvert County.

Like the traffic speeds, intersections along the MD 2/4 corridor also operate as designed with only (Cox Road in Huntington) operating at level of service (LOS) "F" during morning peak hour. LOS F indicates that traffic delay can be 80 seconds or more beyond the programmed signal cycle. All other intersections during the morning and afternoon peak hours operate at LOS D or better; MDOT SHA defines LOS D or better as being acceptable. Table 2 and Map 4 depict the intersection capacity and delay in Calvert County.

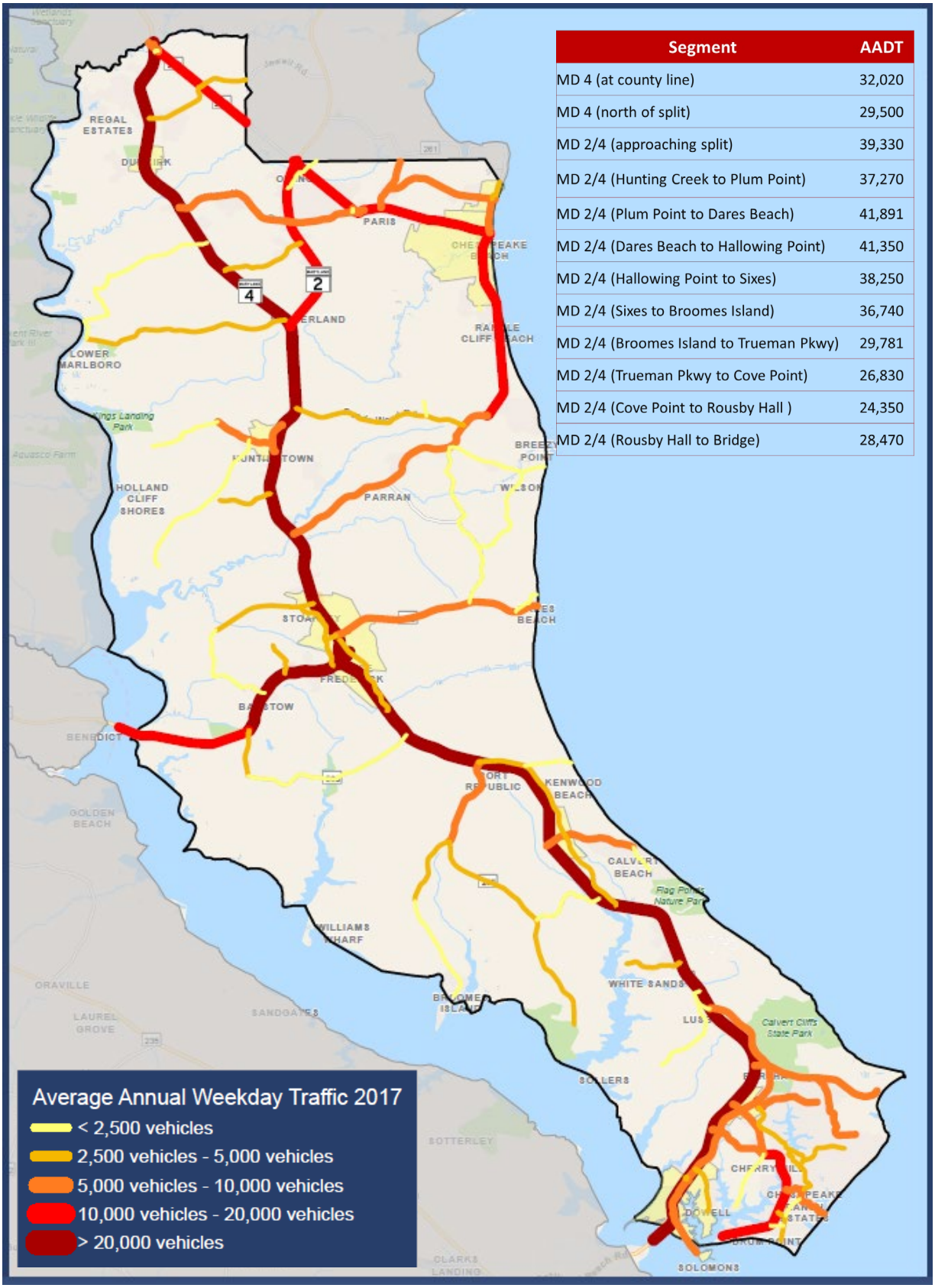
Intersection	LOS (AM/PM)		Average Delay (sec)	
MD 4 @ Ward Rd	C	D	26	48
MD 2/4 Split	D	C	39	28
MD 2/4 @ Cox Rd	D	F	47	217
MD 2/4 @ Plum Point Rd	C	B	25	17
MD2/4 @ Stoakley Rd	C	D	21	46
MD 2/4 @ Dares Beach Rd	C	D	28	40
MD 2/4 @ Church Rd	C	C	26	33
Adelina Rd @ MD 231 (NB Approach)*	B	C	15	18
MD 2/4 @ Sixes Road (EB Approach)*	F	F	186	300+
MD 4 @ Broomes Island Rd	B	B	12	12
MD 2/4 @ Calvert Beach Rd	C	D	24	39
MD 2/4 @ Cove Point Rd	B	C	13	25
MD 2/4 @ Dowell Road* (avg all approaches)	C	B	8	9

** Unsignalized Intersection*
Table 2 Intersection Capacity/Delay

[2] MDOT SHA Office of Planning and Preliminary Engineering Data Services Division AADT of Stations for the Years 2010 – 2016.



Map 4 Intersection Capacity/Delay



Segment	AADT
MD 4 (at county line)	32,020
MD 4 (north of split)	29,500
MD 2/4 (approaching split)	39,330
MD 2/4 (Hunting Creek to Plum Point)	37,270
MD 2/4 (Plum Point to Dares Beach)	41,891
MD 2/4 (Dares Beach to Hallowing Point)	41,350
MD 2/4 (Hallowing Point to Sixes)	38,250
MD 2/4 (Sixes to Broomes Island)	36,740
MD 2/4 (Broomes Island to Trueman Pkwy)	29,781
MD 2/4 (Trueman Pkwy to Cove Point)	26,830
MD 2/4 (Cove Point to Rousby Hall)	24,350
MD 2/4 (Rousby Hall to Bridge)	28,470

Map 5 Average Speed and Reliability

Traffic Safety

Collisions in Calvert County were analyzed from January 2015 – September 2018 using MDiMap open portal crash data. Over this time period there was a total of 4,398 crashes the largest percentage of which involved vehicle collisions (Figure 1).

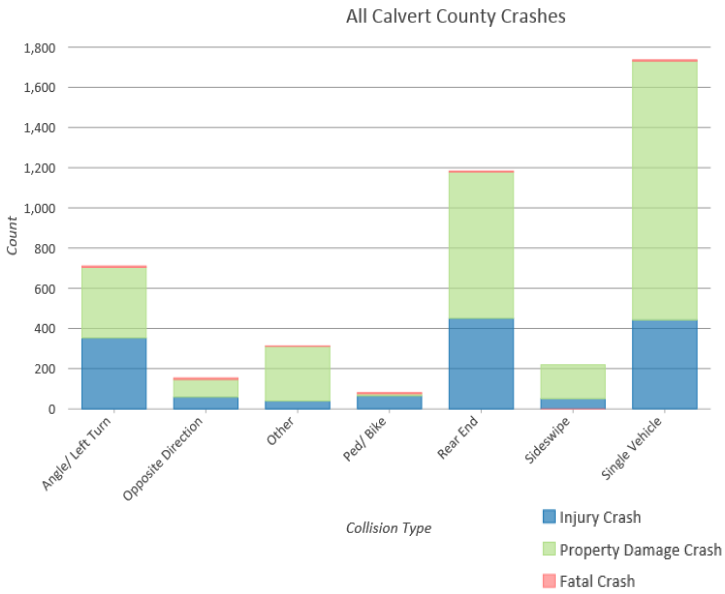
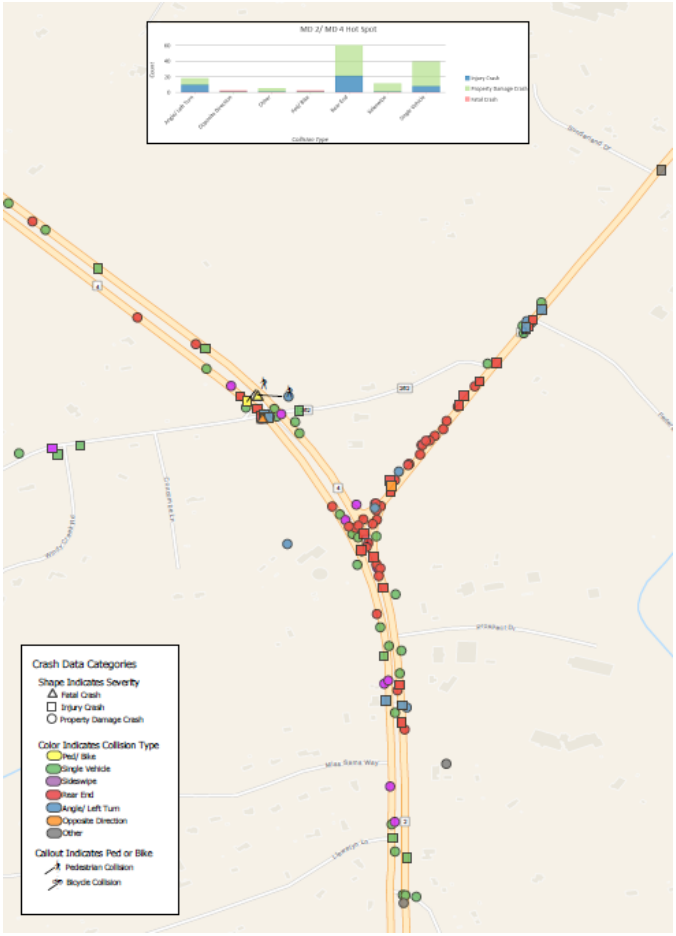


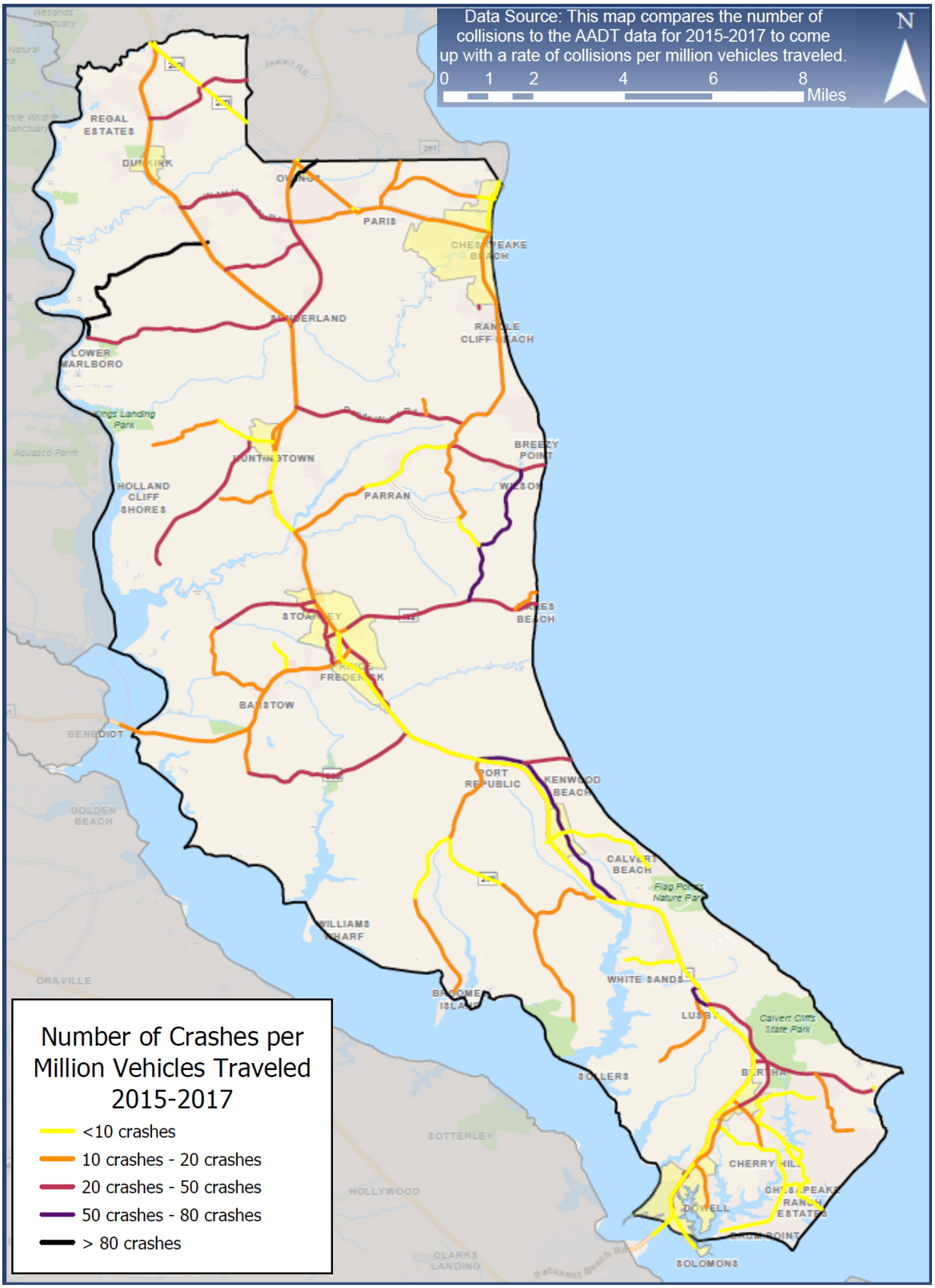
Figure 1 All Crashes in Calvert County January 2015 – September 2018 by Collision Type

Using a heat map methodology, five collision hot spots were identified for further analysis. The hot spot locations make up parts of the following locations: Dunkirk (209 collisions), the MD 2/ MD 4 split (137 collisions), Huntington (120 collisions), Prince Frederick (580 collisions) and Lusby (274 collisions). Although Prince Frederick had more recorded collisions than any other hot spot, none were fatalities. The MD 2/ MD 4 split had the most recorded fatalities with 2 fatalities at the intersection of MD 4 and MD 262 (Map 6).

Crash rates per vehicles traveled was assessed for 2015-2017 using Average Annual Daily Traffic Data (AADT) from MDiMAP open data portal. The data was calculated for the number of crashes per million vehicles traveled (Map 7). The areas with the highest crash rates do not coincide with the collision hot spots and instead occur on collectors and local road where there is less overall traffic. The highest collision rate occurs on Chaneyville Rd in northwest Calvert County (Map 7).



Map 6 Crashes at MD 2/ MD 4 Split



Map 7 Number of Crashes on Calvert County Roads

Traffic Management and Intelligent Transportation Systems

The SHA has implemented several technologies in the areas surrounding Calvert County but has only limited deployments within the county. Currently, MD SHA maintains three video monitoring cameras: MD 260 at Cox Road in Chesapeake Beach, and two at the major bridge crossings of the Patuxent River (MD 4 and MD 231). Further north, MDOT has implemented the Smart Signals on MD 2 approaching Annapolis and dynamic message signs and traffic monitoring cameras along MD 301 through Anne Arundel and Prince George's Counties.

One limitation on MDOT SHA's ability to deploy transportation technology solutions in Calvert County is the limited communications infrastructure such as fiber optic lines which enhance the ability to implement additional video cameras, gather real-time data, operate dynamic message signs and implement real-time traffic signal control. These limitations will become more apparent as the number of connected vehicles using communications devices to convey and share information grows as CAV technology improves and expands. Calvert 2040, Calvert County's comprehensive plan, calls for the continued development of a broadband network for use in a variety of applications. This network could include greater communications capabilities with transportation technology.

Transit Services

There are several public transit options in Calvert County including fixed route and ADA paratransit services provided by Calvert County Public Transit and by the commuter bus service to Washington, DC provided by MTA. There are no intercity bus services (Greyhound, Peter Pan, etc.) which operate in Calvert County.

Calvert Public Transit

The local Calvert County Public Transit bus service is comprised of eight routes focusing on various parts of the county. These routes are the Dunkirk Route, Lusby Shuttle, Prince Frederick Shuttle I, Prince Frederick Shuttle II, Mid-County, North Route, South Route and Charlotte Hall. These buses provide bus transportation to link residents with employment centers, shopping centers and medical facilities and other public services. The bus system is run on a "flag system" which means there are few established bus stops and buses can be hailed along the route by passengers. Bus service operates on weekdays and have limited service on Saturdays.

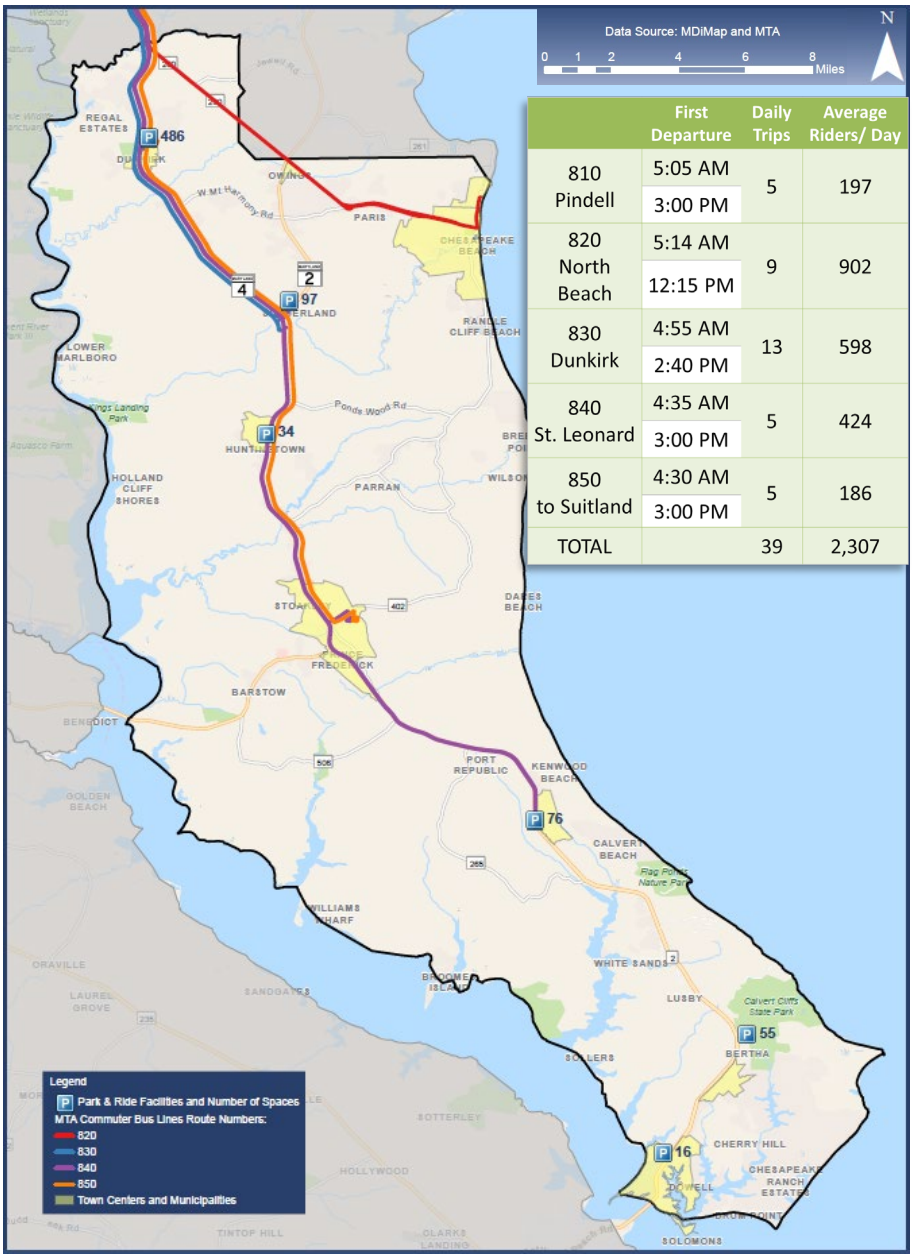
The total passenger trips per year is about 99,000 passenger trips with the Prince Frederick Shuttle I having the highest ridership. The total service distance is just under 400,000 miles. Other transit programs including the ADA Paratransit and the SSAP (Statewide Special Transportation Program) service approximately 14,000 passenger trips a year.

Routes	Annual Ridership
Dunkirk	3,169
North I & II	18,207
Prince Frederick Shuttle I	28,839
Prince Frederick Shuttle II	9,084
Mid County	6,067
South	17,044
Lusby Shuttle	10,329
Saturday Service	5,427
Charlotte Hall	883
Subtotal - Route Service	99,049
ADA Paratransit	**13,599**
All Transit Services	**112,648**

Table 3 Calvert County Public Transit Bus Annual Ridership

MTA Commuter Bus

There are four MTA commuter bus routes serving Calvert County and connecting commuters to Washington DC. Approximately 2,300 trips are taken daily on the regional commuter service as shown below with the greatest ridership being on the route from North Beach. Table 3 and Map 8 depict the regional commuter service in Calvert County. The county is also served by park and ride lots in Dunkirk, Sunderland, Huntington, St. Leonard, north of Lusby and Solomons. Park and Ride locations are shown on Map 8.



	First Departure	Daily Trips	Average Riders/ Day
810 Pindell	5:05 AM 3:00 PM	5	197
820 North Beach	5:14 AM 12:15 PM	9	902
830 Dunkirk	4:55 AM 2:40 PM	13	598
840 St. Leonard	4:35 AM 3:00 PM	5	424
850 to Suitland	4:30 AM 3:00 PM	5	186
TOTAL		39	2,307

Table 4 MTA Routes Schedule and Map 8 MTA Commuter Bus Lines & Park and Ride Facilities Average Ridership

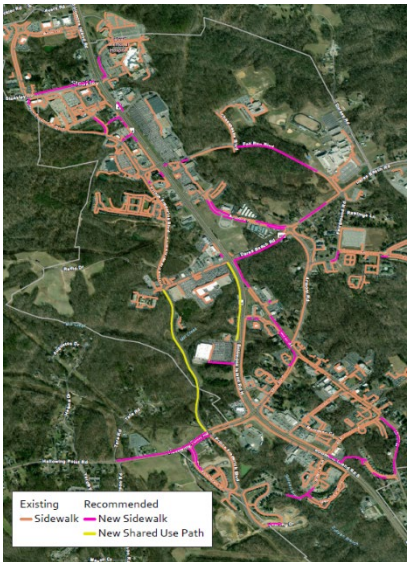
Bike and Sidewalk Network

Calvert County is not well-suited for walking and bicycling as a means of transportation. Although sidewalks exist in some of the developed shopping centers and activity nodes, the network is not well connected for continuous pedestrian trips. The lack of safe, signalized pedestrian crossings between the two sides of MD 2/4 also poses a challenge for a functional pedestrian system. The pedestrian networks within the town centers are in segments and new development along MD 2/4 are responsible for including sidewalks in their future plans. Huntington is the only town center that does not need significant alteration in the pedestrian network. Three maps of the major town centers and their existing and recommended sidewalk network are shown below.

Trails and Paths

The 2019 Maryland Department of Transportation Bike and Pedestrian Master Plan notes the lack of bicycle facilities in Calvert County as nearly all of county's trails are contained within or connect between county and state parks. The lone exception is the Chesapeake Beach Railway Trail from the Chesapeake Beach Water Park and extending westward along the shore of Fishing Creak, although it too is intended for recreational purposes.

The Calvert County Department of Recreation and Parks is acquiring portions of the former Baltimore & Drum Point Railroad with a special focus on the portion that runs through Prince Frederick, to develop it as a pedestrian/bicycle trail. The County government owns the portion of the Baltimore & Drum Point Railroad that crosses King Memorial Park in Prince Frederick (approximately 525 linear feet). As other portions of the railroad bed in Prince Frederick are acquired, develop these as a pedestrian/bicycle trail from north of Calvert Memorial Hospital, behind the Fox Run Shopping Center, through the woods along Armory Road, across Main Street, to King Memorial Park.[3]



Prince Frederick

Lusby

Solomons

[3] https://www.thewashcycle.com/2017/10/baltimore-and-drum-point-.html accessed on April 17, 2019

Environmental Issues

Flooding and Flood Resiliency Plan

The Federal Emergency Management Agency (FEMA) has identified special flood hazard areas within the boundaries of Calvert County. Additionally, a hazard identification and vulnerability assessment recognized all or part of Calvert County as having high vulnerability to hurricane/tropical storms, severe storms/winter storm and tornadoes and moderate vulnerability to drought, extreme temperatures and earthquakes. The County has been preparing an update to the Flood Mitigation Plan and a Hazards Mitigation Plan to improve Calvert County's resistance to natural hazards, including flooding, by identifying actions to reduce the impact of various hazards to people and property. The goal and purpose of these plans is to identify which communities and individual structures are most vulnerable to flooding, and discusses the potential economic, and public health and safety impacts to the county, as well as to improve Calvert County and its municipalities' resistance to floods and other hazards by identifying actions to reduce the impacts to county residents and structures. The Flood Mitigation Plan must be approved by FEMA and Maryland Emergency Management Agency (MEMA) prior to being adopted by the County.

In addition to the countywide plans, small area flood mitigation plans for the county's most flood prone communities are in various stages of planning and completion. These communities include: Cove Point and Broomes Island (adopted); Plum Point including Breezy Point and Neeld Estate (drafted); and the Towns of Chesapeake and North Beach (in development).

Watershed Implementation Plan

There are three phases of Watershed Implementation Plans (WIPs) developed by each jurisdiction within the Chesapeake Bay watershed. Maryland's Draft Phase III Watershed Implementation Plan to Restore Chesapeake Bay by 2025 was developed by a collaboration of state agencies that comprise the Governor's Chesapeake Bay Cabinet. Phase I and Phase II WIPs were developed and submitted to EPA in 2010 and 2012, respectively. Both Phase I and Phase II WIPs describe actions and controls to be implemented by 2017 and 2025 to achieve applicable water quality standards. Having reached the mid-point between development of the 2010 Total Maximum Daily Load (TMDL), which establishes current Chesapeake Bay pollution reduction goals and the ultimate 2025 restoration deadline, Maryland's Phase III WIP identifies the strategies, opportunities, and challenges in not only meeting the 2025 Chesapeake Bay Restoration targets, but also sustaining restoration into the future. Maryland's 2025 targets for bay restoration include reductions in total nitrogen total phosphorus. In meeting these targets, the state will also meet its sediment goals.

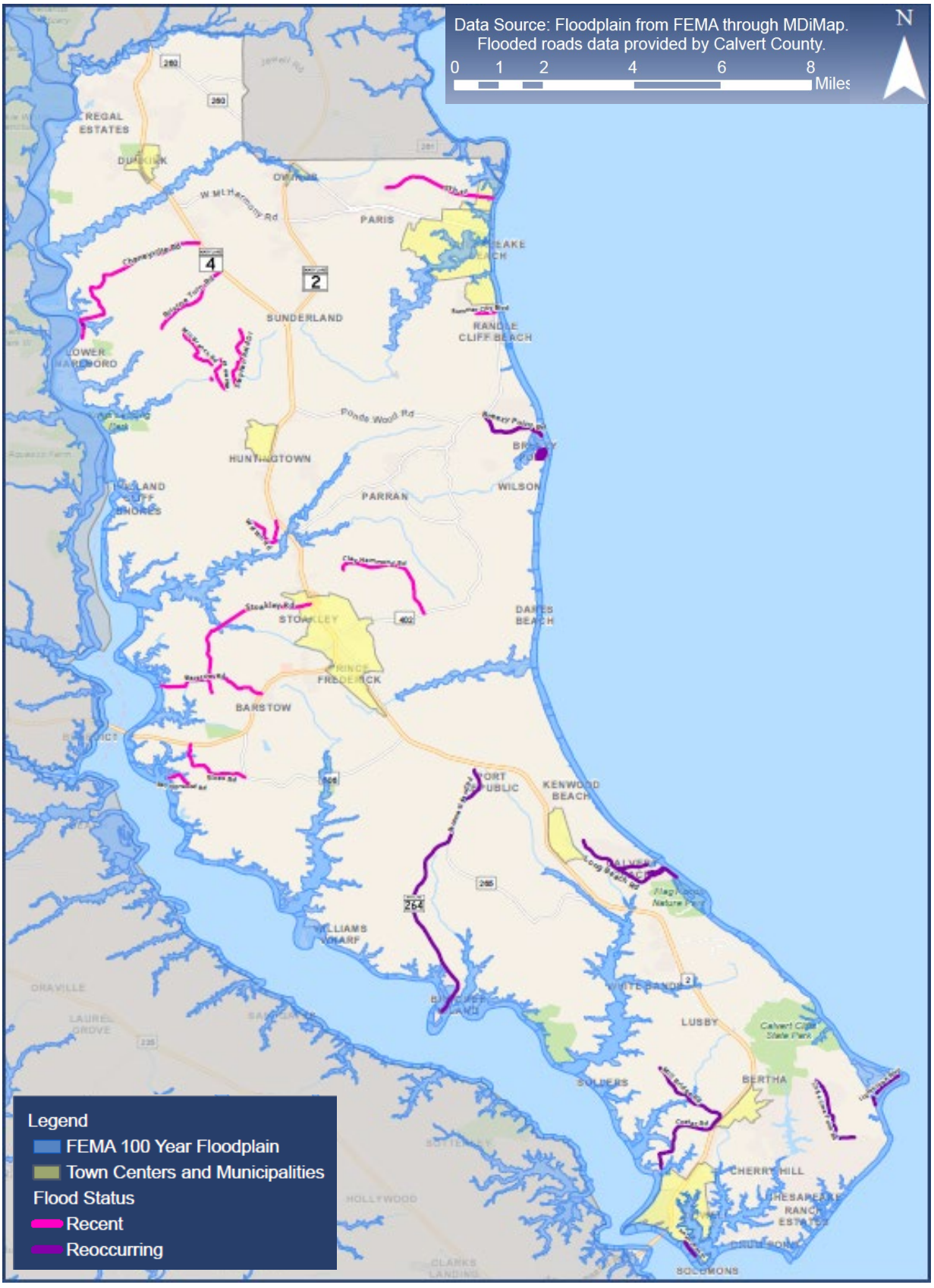
During the development of the Phase III WIP, the state reached out to local government staff, including Calvert County staff and the interested public to lay out strategies and a framework for creating a feasible and balanced approach to creating goals for each jurisdiction, by sector. The sectors include agriculture, developed, septic, and wastewater. Calvert County goals, among others, include stream and wetland restoration and buffers, prescribed grazing and shoreline restoration. Maryland's Draft Phase III WIP was released for public comment in April 2019 and the Final Phase III WIP is scheduled for completion in August 2019.

Calvert County Phase II Watershed Implementation Plan noted the following actions to achieve Phase II WIP nitrogen, phosphorous and sediment target load goals for the County:

- The County's practice of land application of wastewater effluent rather than direct discharge at 2 of the County's 3 major waste water treatment plants (WWTPs)
- The use of shared community septic systems that utilize pretreatment and land application
- Identifying and upgrading failing septic systems
- Initiating watershed implementation plans in selected subwatersheds to identify pollution sources and develop a strategy to reduce pollutants
- Upgrading to enhanced nutrient removal (ENR) at Chesapeake Beach WWTP
- Targeting growth to town centers served by public sewer
- Conducting public outreach and education on the importance of pumping septic systems through programs such as the Calvert County Environmental Commission's "Pump for the Bay Contest"
- Upgrading existing conventional septic systems to nitrogen-removing systems through a Bay Restoration Fund grant
- Minimizing future residential development in the Farm and Forest Zoning District through two downzonings and a TDR program, providing funding for land preservation through the Purchase and Retirement of TDRs (PAR Program)
- Implementing lots-to-TDRs program to convert existing undeveloped lots to open space[4]

Department of Public Works has been doing a variety of projects to address these actions, and the County is now drafting Phase III.

[4] Calvert County WIP II Strategy



Map 10 Calvert County Floodplain

Issues and Observations

- The County is improving its asset management system for roads and bridges. While county-owned bridges are in very good condition, there is a significant yet undefined backlog of street repaving that needs to occur.
- The most significant traffic congestion issues occur on state roadways; however, when measured against standards established by MDOT SHA as indicated by average speed and intersection level of service, there is minimal traffic congestion in Calvert County.
- Localized recurring and non-recurring congestion are not well-monitored by MDOT SHA. Traffic systems management and operations strategies are not being deployed in Calvert County.
- Public concern regarding traffic congestion appears to be focused on difficulties getting around within the county rather to external destinations.
- Traffic crashes are highly-concentrated along MD 2/4 the town centers.
- Traffic growth is uneven throughout the county but overall relatively modest when compared to other parts of Maryland.
- Increasing tidal activity and severe storms is causing more roads to flood than ever before; thirty roads have experienced recent or recurring flooding.