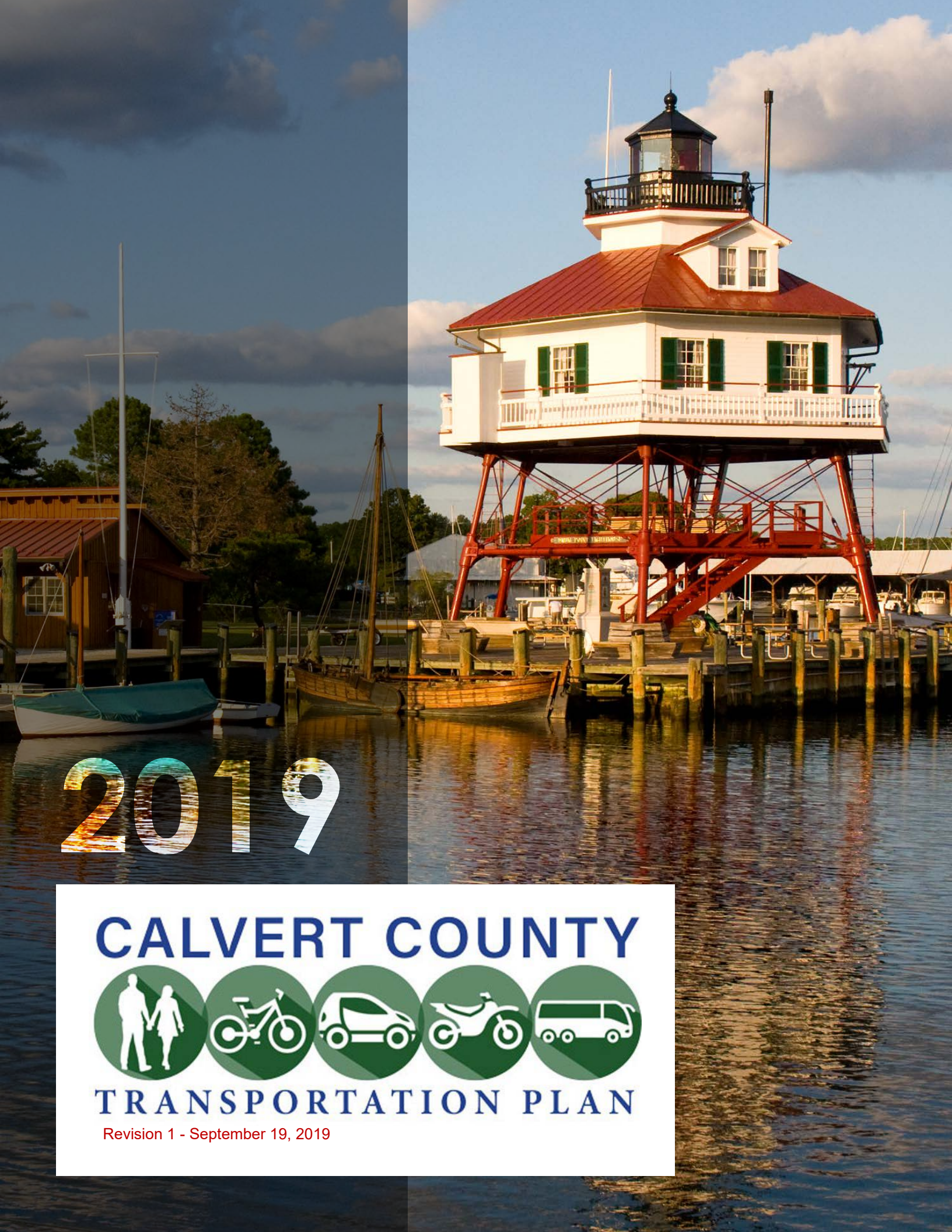

2019

CALVERT COUNTY TRANSPORTATION PLAN

Revision 1 - September 19, 2019

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Table of Contents

List of Acronyms

AADT	Annual Average Daily Traffic
APF	Adequate Public Facilities
CTP	Capital Transportation Program
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
IDZD	Intelligent Dilemma Zone Detection
LOS	Level of Service
MDOT	Maryland Department of Transportation
MDOT MTA	Maryland Department of Transportation Maryland Transit Administration
MDOT SHA	Maryland Department of Transportation State Highway Administration
MWCOG	Metropolitan Washington Council of Governments
NAS	Naval Air Station
TAZ	Transportation Analysis Zones
V/C	Volume to Capacity Ratio
LODES	Longitudinal Origin Destination Employment Statistics

Introduction and Executive Summary

Over a thirty-year period beginning in the mid-1980s, Calvert County's population grew by nearly 160% to 92,000 residents in 2018. This growth can be attributed to the always strong federal sector in the core of Washington, DC, Joint Base Andrews, Suitland, New Carrollton and other suburbs, and base realignment to the benefit of the 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, Maryland Department of Transportation's State Highway Administration (MDOT SHA) 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 (MTA) grew its commuter bus ridership and park-and-ride capacity nearly tenfold. The County also implemented a growth management strategy that preserved rural areas and targeted Town Centers in Dunkirk, Owings, Huntingtown, Prince Frederick, St. Leonard, Lusby and Solomons 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. 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 do so with a longer commute to a destination outside of the County.

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 1983 Comprehensive Plan, the county initiated 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 automobile. More than 90% of county residents commute to work alone in their personal vehicle; fewer than 3% percent use public transit. Given the 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 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 auto use for many trips within Town Centers.

Figure A - Calvert County in the Metropolitan Area.

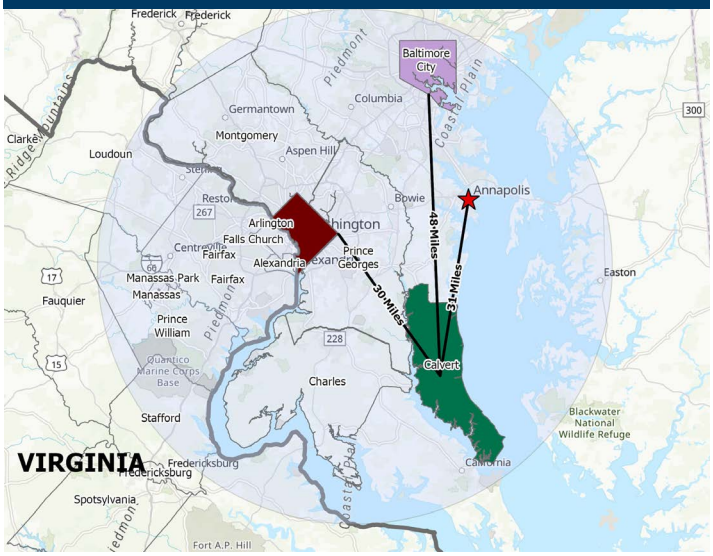


Table 1 - Transportation Characteristics 2009 vs 2017

Key Transportation Characteristics	2009	2017
Workers 16 Years or Older	45431	44872
Drive Alone	90.2%	90.1%
Use Public Transit	3.0%	3.0%
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 Minute Drive	26.4%	29.0%

Source: U.S. Census Bureau, American Community Survey

Commuting and Traffic Conditions

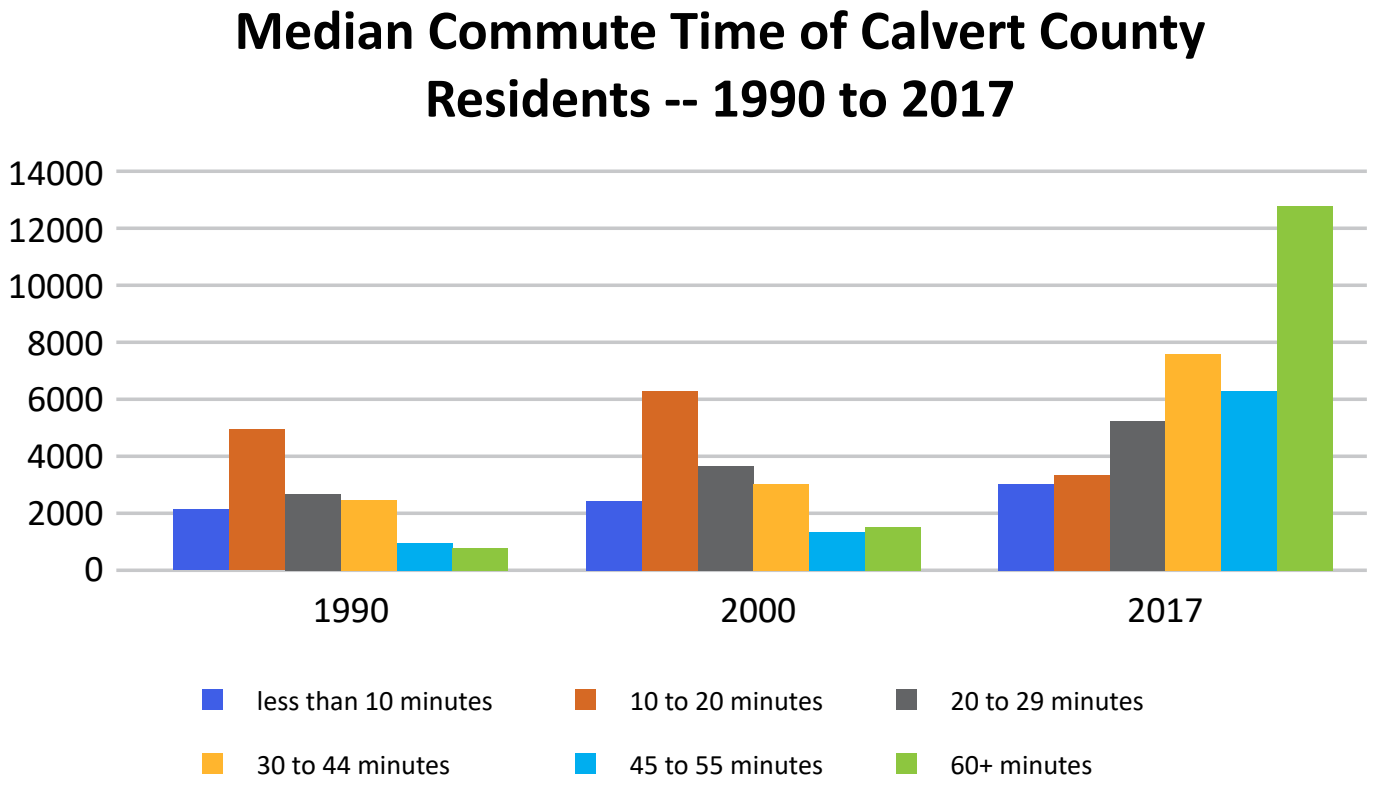
The lack of major employers in Calvert County results in slightly more than 65% of commuting trips destined for locations outside of Calvert County. This phenomenon has steadily increased over the past three decades. Military facilities (Naval Support Facility Indian Head, Joint Base Andrews, Naval Air Station Patuxent River), defense agencies and contractors and non-defense federal agencies are the largest employment destinations for Calvert County residents. (See figure C.)

Fewer 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 Annapolis, southern Anne Arundel, Charles, and St. Mary's counties. (See figure D)

Finally, data[1] indicates that MD 2/4 carries a relatively insignificant amount of 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 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. (See figure G)

Long Distance Commuters
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. Maryland has the longest average commute of any state in the nation at 31.8 minutes.

Figure B - Median Commute Time of Calvert County Residents-1990 to 2017



Source: U.S. Census Bureau, American Community Survey

[1] *Streetlight: Data for Mobility (proprietary data set), 2018*

Outbound Commutes from Calvert County

Figure C

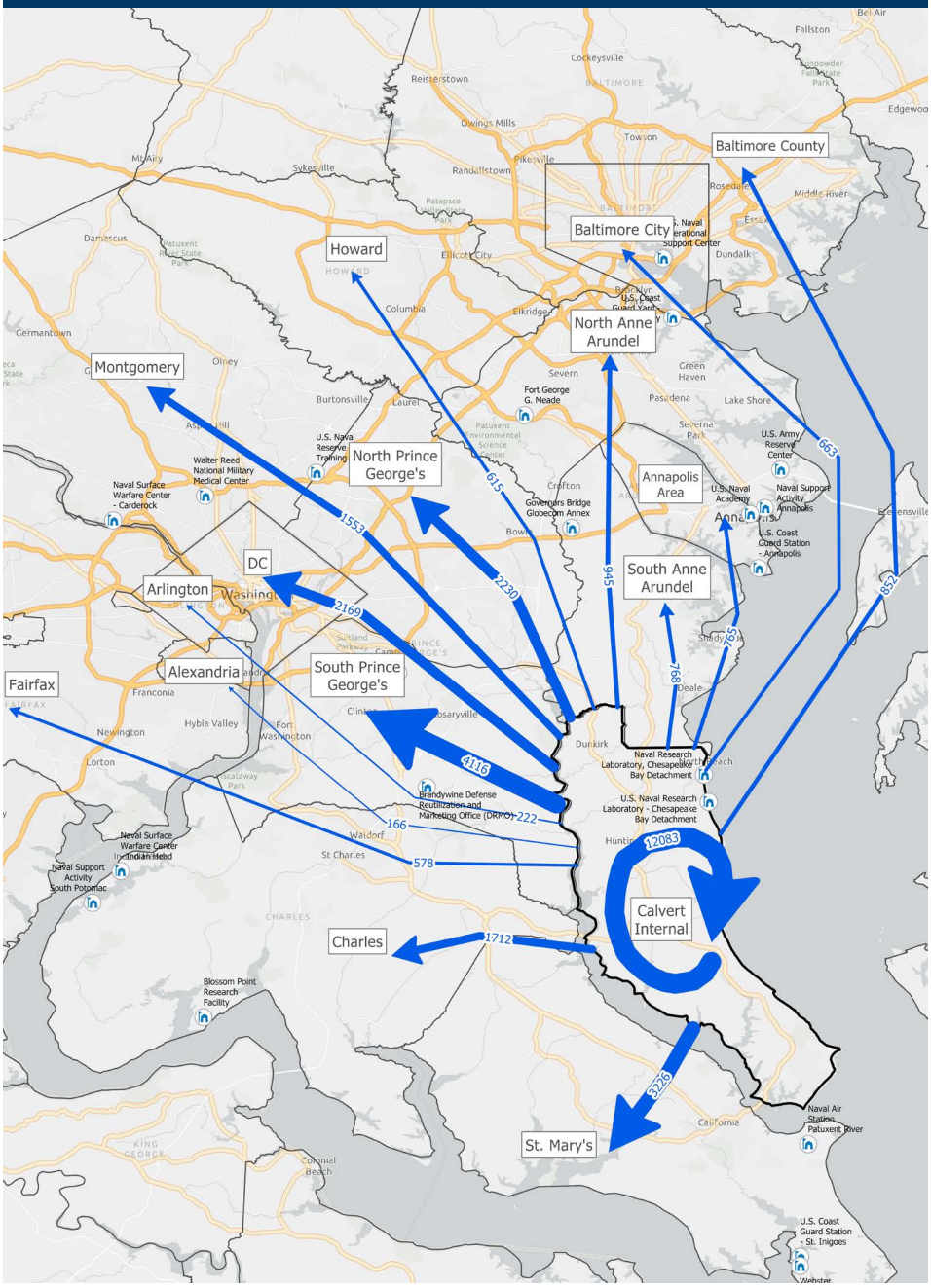


Table 2 - % of Workers from Calvert County to Surrounding Jurisdictions

Trip Origin	% 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

Source: U.S. Department of Labor, LEHD Origin-Destination Employee Statistics (LODES, 2017)

Inbound Commutes to Calvert County

Figure D

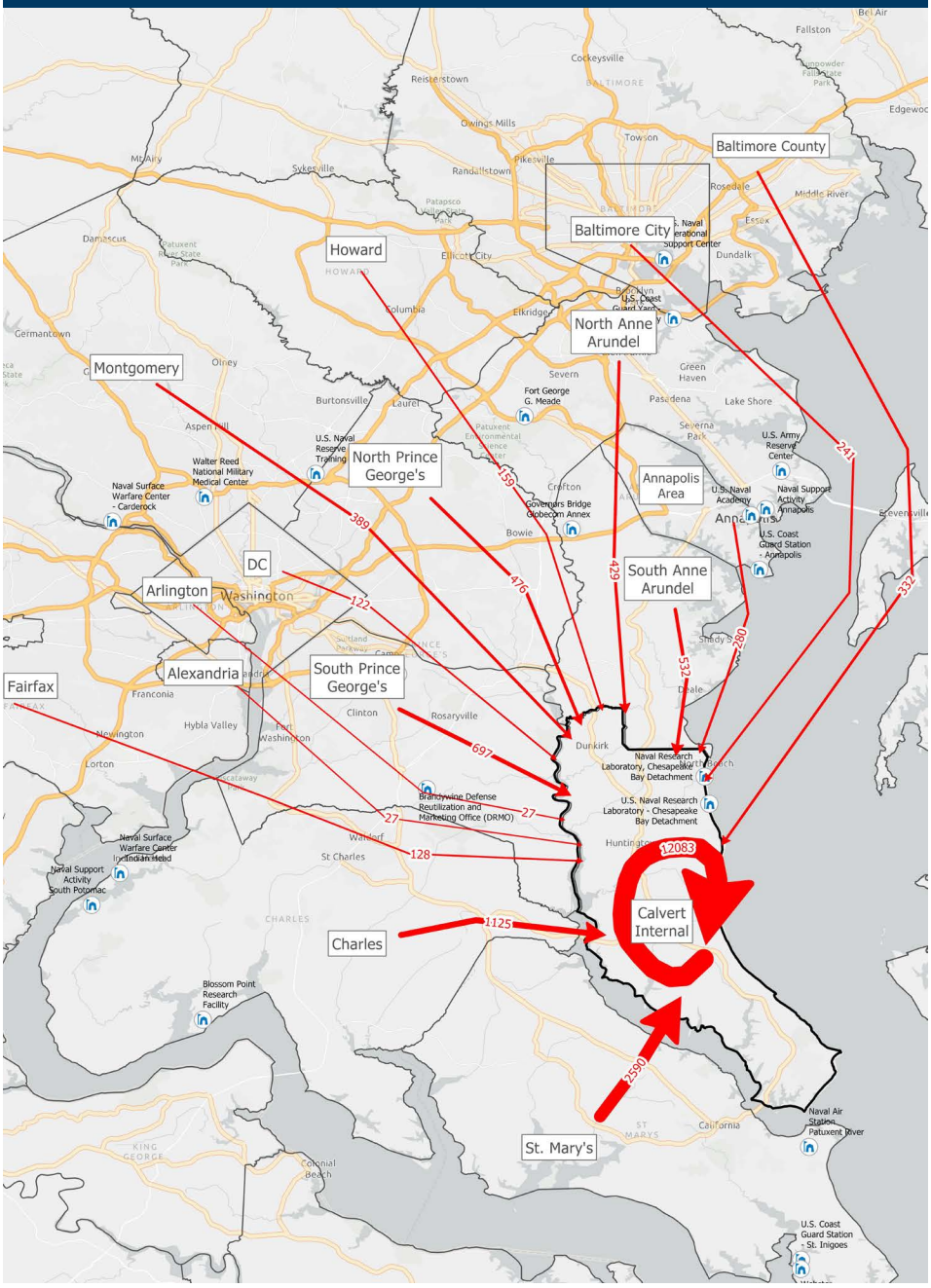


Table 3 - % of Workers Commuting to Calvert County by Jurisdictions

Trip Origin	% of Trips
St. Mary's County	28.3
Charles County	11.8
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

Source: U.S. Department of Labor, LEHD Origin-Destination Employee Statistics (LODES, 2017)

Traffic Changes Over Time

Annual Average Daily Traffic (AADT) along MD 2/4 ranges from 24,350 trips (bi-directional) near Cove Point to 41,000 trips in Prince Frederick. Most roads with two lanes in each direction (not inclusive of turning and acceleration/deceleration lanes) can carry approximately 50,300 - 56,175 trips daily[2]. This would indicate at a high level that MD 2/4 has the correct number of mainline lanes in each direction. (See Table 4 and Figure E)

Since 2010 when residential growth settled into a slow growth rate, there have been significant variations in traffic volumes on MD 2/4:

- Between Huntingtown (MD 263) and the MD 2/4 split, a modest 1.5% increase in Annual Average Daily Traffic (AADT.)
- Through Prince Frederick (MD 402 to MD 263), AADT dropped by 14.6% from 48,012 to 40,990. Some of this decline appears to be associated with the opening of Prince Frederick Boulevard in 2014 which now carries approximately 3,000 trips per day.
- Through Lusby and Solomons (from Coster Road/Mill Bridge Road to Lore Road), traffic increased by 11%.

Table 4 - 2017 Annual Average Daily Traffic

Segment	AADT
MD 4 (@ 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 Truman Pkwy)	29,781
MD 2/4 (Truman 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

Source: MDOT State Highway Administration

Figure E - 2017 Annual Average Daily Traffic

[2] *2013 Quality/Level of Service Handbook, State of Florida Department of Transportation*

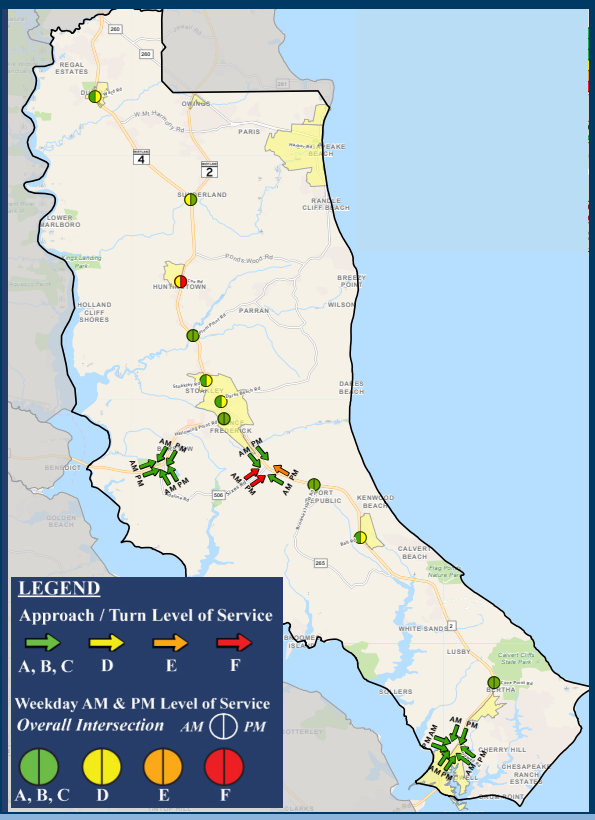
Current Road System Performance

On a countywide basis and when measured against objective industry standards[3], Calvert County's road system provides ample capacity for trips made by current residents and workers in the county. While there are hot spots of congestion at certain times of the day, overall the system operates very well.

All along the MD 2/4 corridor, morning peak hour[4] traffic 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 263 and MD 402. Figure L1 and L2 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 intended with only Cox Road in Huntingtown 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 5 and Figure F depicts the intersection capacity and delay in Calvert County.

Figure F - 2019 Intersection Capacity and Delay



Source: Data collected by SAI, April 2019

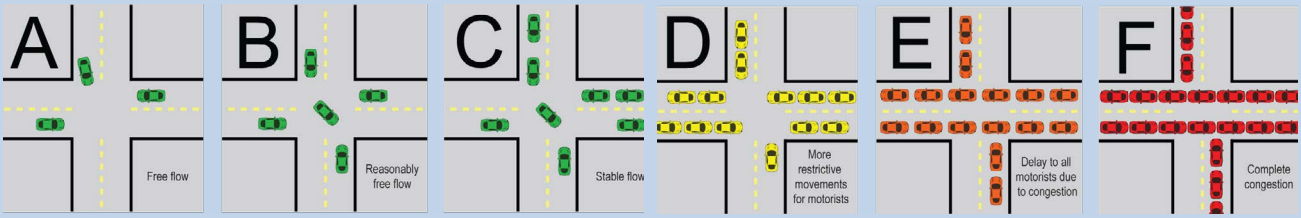
Table 5 - 2019 Intersection Capacity and Delay

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

** Unsignalized Intersection. Note: MD 2/4 intersection improvement opened in August 2019 is expected to return location to LOS B (AM) and B (PM)*

Source: Data collected by SAI, April 2019

Level of Service Key



[3] *The term "industry standards" refers to level of service, volume-to-capacity ratio, delay and other performance measures as defined by the Institute for Transportation Engineers.*

[4] *The term "peak hour" refers to that 60 minute period with the highest traffic volume. The peak period can vary by region, corridor, or roadway link. In Calvert County, the peak hour ranged from 6:45 AM to 8:05 AM. For the purpose of standardization within this analysis, the peak hour of 7:00 AM to 8:00 AM was used.*

Figure G - Traffic traveling through Calvert County

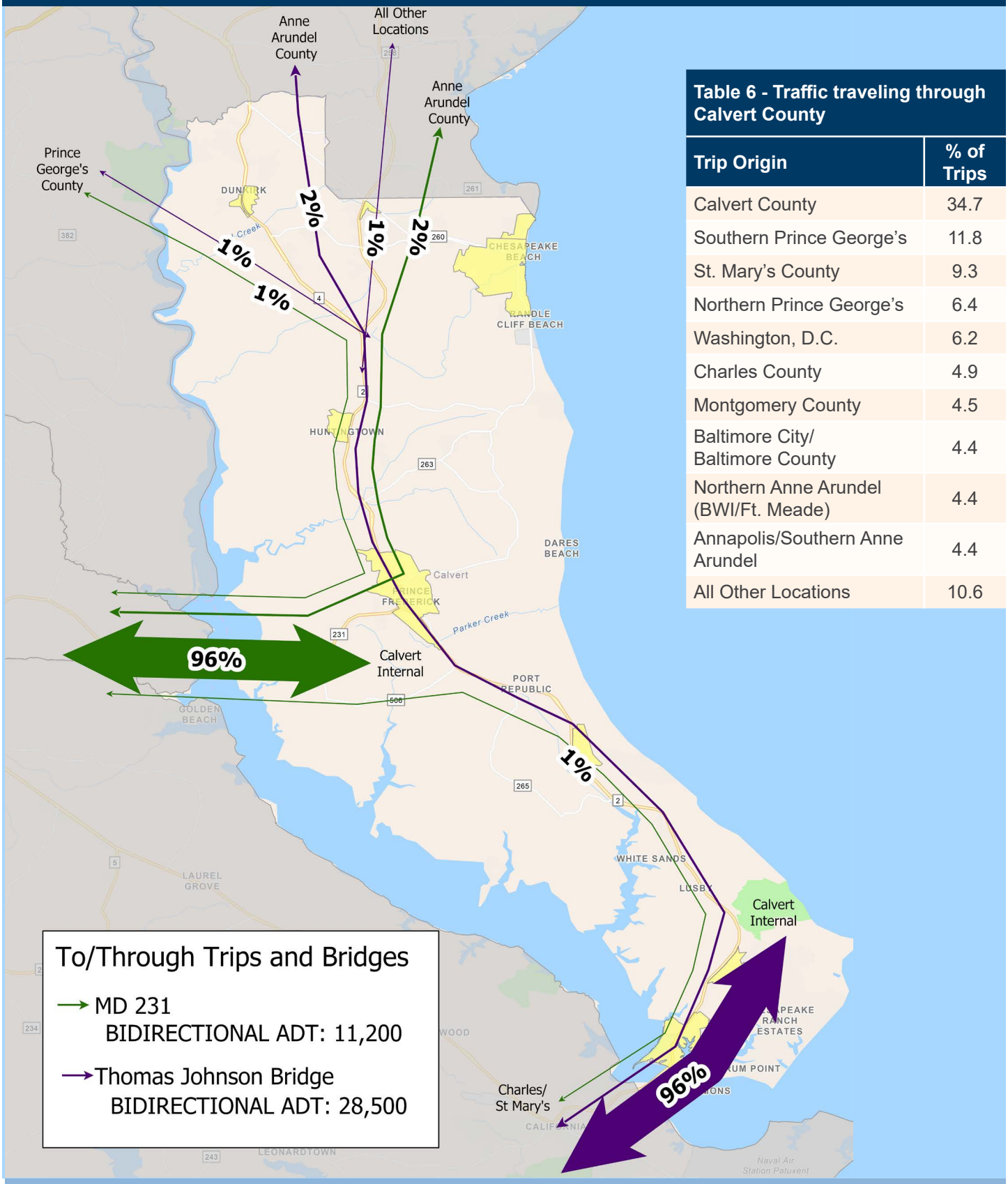


Table 6 - Traffic traveling through Calvert County

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Northern Anne Arundel (BWI/Ft. Meade)	4.4
Annapolis/Southern Anne Arundel	4.4
All Other Locations	10.6

Source: Data collected for SAI by Streetlight Data, Inc., April 2019

Transportation Choices

For nearly all residents of Calvert County, mobility is almost exclusively by automobile. 90% of all commuting trips are made by individuals driving alone and 3% of all residents don't commute, they work at home. The remaining commuters carpool or use public transit, specifically MDOT MTA commuter buses to Washington, DC. Commuter bus service has been tremendously successful. Using LODES data to establish the actual number of trips each to Washington, DC, it is estimated that as many as 40% of all commuting trips taken to Washington, DC by Calvert residents are by way of commuter bus. Other than limited service to the Federal Center at Suitland, no other commuter routes serve other parts of Maryland or Northern Virginia.

Table 7 - Commuter Bus Service to Washington, DC

	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 Suitland	4:30 AM 3:00 PM	5	186
TOTAL		37	2,307

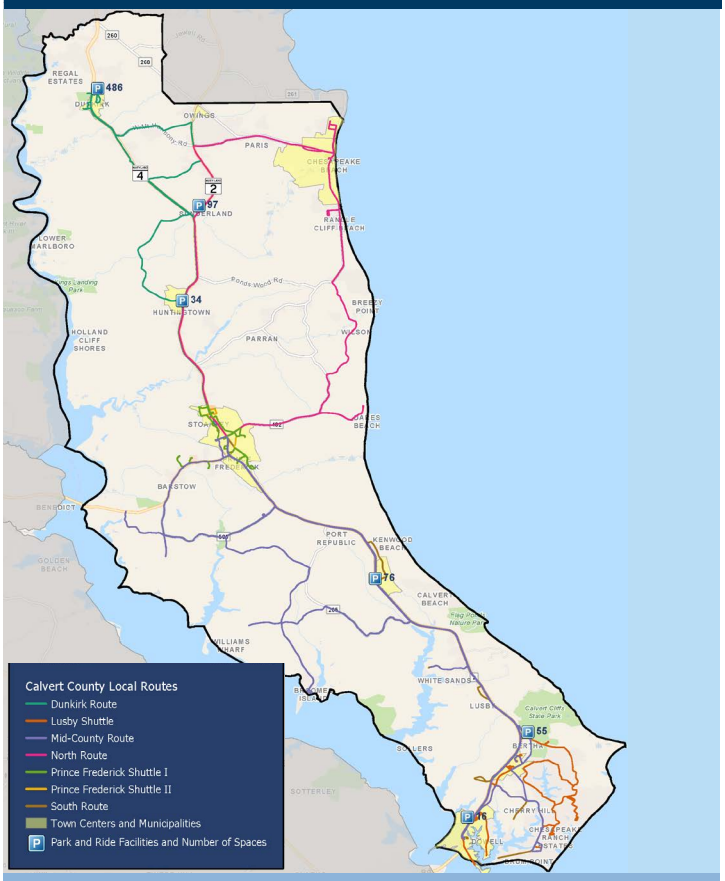
Source: MDOT Maryland Transit Administration, 2018

For the mobility-impaired or households with no vehicle, getting to and from work, health care services, the grocery store and other activities of daily life can be a major challenge. The Calvert County Department of Community Resources operates bus service on eight routes shown in map and table below and focuses mainly on providing access to shopping centers, medical facilities and other public services in the Town Centers. 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 every 90 – 120 minutes between 7 a.m. and 9 p.m.; and very limited service on Saturdays.

Figure H1 - Commuter Bus Service to Washington, DC

Source: MDOT Maryland Transit Administration

Figure H2 - Local Bus Routes



Source: MDOT Maryland Transit Administration

Finally, travel on foot or by bicycle is extremely difficult and thus represents a tiny percentage of all trips in the county. Although improved over the past decade, there are significant gaps in the sidewalk network throughout the Town Centers. Sidewalk gaps result from long ago policies that did not emphasize pedestrian connectivity. This will improve as development occurs, but significant public investment will be needed to close many of the gaps. While sidewalks and bicycle facilities are an important aspect of making Town Centers successful, it cannot be reasonably expected that trips on foot or bicycle will ever result in reduced traffic congestion in Calvert County. Like transit services, sidewalks and bicycle lanes simply provide a choice in how to move around within parts of Calvert County, especially within the Town Centers.

Figure I - Sidewalks in Dunkirk (See Pages 28-33 of Appendix for other Town Centers)

Source: Data collected by SAI, April 2019

Transportation Challenges

Every county and region has its unique transportation challenges. Metropolitan areas have very high rates of traffic congestion and traffic crashes affecting broad swaths of the region. Rural communities have more isolated traffic congestion problems of more limited duration and have few practical transportation choices and services for the mobility impaired. As Calvert County looks ahead to 2040, it is important to report on these challenges in the context of what else is happening throughout the state.

Most of the major roadways in Calvert County are owned by the state of Maryland. When compared to the Metropolitan areas, traffic growth and congestion in Calvert County is very modest, and the cost-benefit ratio of significant construction improvements by MDOT SHA in Calvert County is quite low. As such, Calvert County has seen (and will likely continue to see) relatively little state investment in new road capacity, with the exception being the widening of MD 2/4 through Prince Frederick. Initially developed as a two-phase project (one north and one south of MD 402), the project has now been chopped into several very short segments which would be constructed over the next twenty years. The slowing of the MD 2/4 project is symptomatic of a federal transportation funding system that isn't working and a state funding mechanism that can't keep up with Maryland's transportation needs.

Calvert County is hardly in any position to fill the gap between roadway needs and available resources. While conservative fiscal management has allowed the County to maintain a sound financial position and a AAA bond rating, investments in new transportation infrastructure have been limited. Over the past decade, County capital budgets allocated the greatest share of resources to education ($90 - $110 million annually) and public safety ($40 - $60 million annually) while investments in new transportation capacity have averaged less than $4 million annually. In the FY20 operating budget, the Board of County Commissioners made a significant investment in road paving at $6 million which begins to address the backlog of road repair needs. While more can always be done by local and state government, developers and others, Calvert County appears to have struck a proper balance between the public service needs and concerns of its residents.

Still, there are challenges in the transportation system and how it will evolve over the next twenty years will depend on the setting of policy and funding priorities. These are the most prominent challenges to be considered as the County looks forward.

Traffic Safety

Between 2015 and 2018, there were just under 4,400 traffic crashes in Calvert County – an average of four per day. (By way of comparison, Anne Arundel County experiences nearly 30 traffic crashes per day.) While this is a relatively low rate of occurrence locally, traffic safety nationally has become a public health crisis. Not surprisingly, the preponderance of traffic crashes is along MD 2/4 and specifically in or approaching the Town Centers. None of these crashes involved fatalities although serious injuries and property damage has occurred. The first southbound signalized intersection along the high-speed section of MD 4, MD 2/4 split and the intersection of MD 262 are of concern as numerous serious crashes have occurred, including three fatalities (including one pedestrian).

While many traffic crashes are a result of routine human error and can be mitigated with physical improvements, certain risky and antisocial behaviors have been identified as a concern as well. Calvert County has the second highest per capita rate of crashes involving motorcycles and sixth highest per capita rate of alcohol or drug impaired crashes in the state. St. Mary's County has very similar crash rates in both categories.

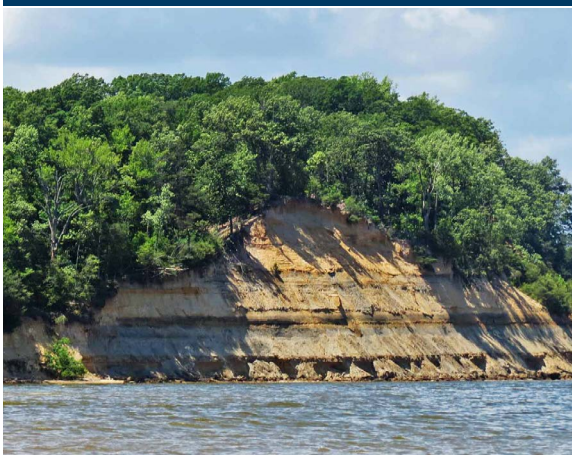
Vehicles running off the road are one of the leading causes of traffic crashes in Calvert County.

Geography & Environmental Constraints

Calvert County is a long narrow peninsula bounded by the Patuxent River to the west and the Chesapeake Bay to the east and south. MD 2/4 is the only arterial which runs the full north-south span of the County. The Thomas Johnson Bridge crosses the Patuxent River to the south into St. Mary's County. Prince George's and Anne Arundel Counties are to the northwest and northeast, respectively. One bridge crosses the Patuxent River to Charles County two-thirds of the way south of the northern county boundary. Several state roadways branch east and west from the MD 2/4 spine and are supported by a local network of collectors and minor arterials connecting further to the interior.

Other than building loop roads, realigning some roadway sections and completing planned connections, there isn't much room for new roads in Calvert County. Where opportunities might exist, environmental challenges such as steep slopes, protected forest and agricultural lands, and sensitive wildlife habitats would be difficult to overcome.

Calvert Cliffs State Park



Aging Population

Significant implications for mobility arise from an aging population, most specifically access to social networks, health care and healthy foods. While advanced age and attendant health concerns (declining vision and hearing, for example) are not always limiting factors in mobility, they are certainly a significant constraint for many. More than 25% of Calvert County residents are age 65 or older – a seven-fold increase since 1990. The County's transportation system has not fundamentally changed to serve this demographic. Calvert County should address this need as a matter of public health and safety.

Transportation Technologies

MDOT SHA has implemented several technologies in the areas surrounding Calvert County but has only limited deployments within Calvert County. Currently, MDOT SHA maintains three video monitoring cameras: MD 260 at Cox Road in Chesapeake Beach, and two at the bridge crossings of the Patuxent River (MD 4 and MD 231). Further north, MDOT SHA has implemented the Smart Signals program 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 and as Connected and Automated Vehicle technology improves and expands.

Climate Change & Infrastructure Resiliency

Increasing tidal activity and severe storms are causing more roads to flood than ever before; thirty roads have experienced recent or recurring flooding since 2018. Floods are generally the result of excessive precipitation and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time; and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is determined by the following: a combination of stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing. A variety of strategies are used to combat flooding depending on the frequency, cause and extent of the flooding.

Table 8 - Ranking of highest probability hazards for Calvert County

Hazard	Rank
Flood	1
Coastal Storm Wind	2
Tornado	3
Severe Thunderstorm	4
Lightning	5
Earthquake	6
Winter Storm	7
Extreme Temperatures	8
Hail	9
Drought	10

Source: Calvert County All Hazards Mitigation Plan, June 2017

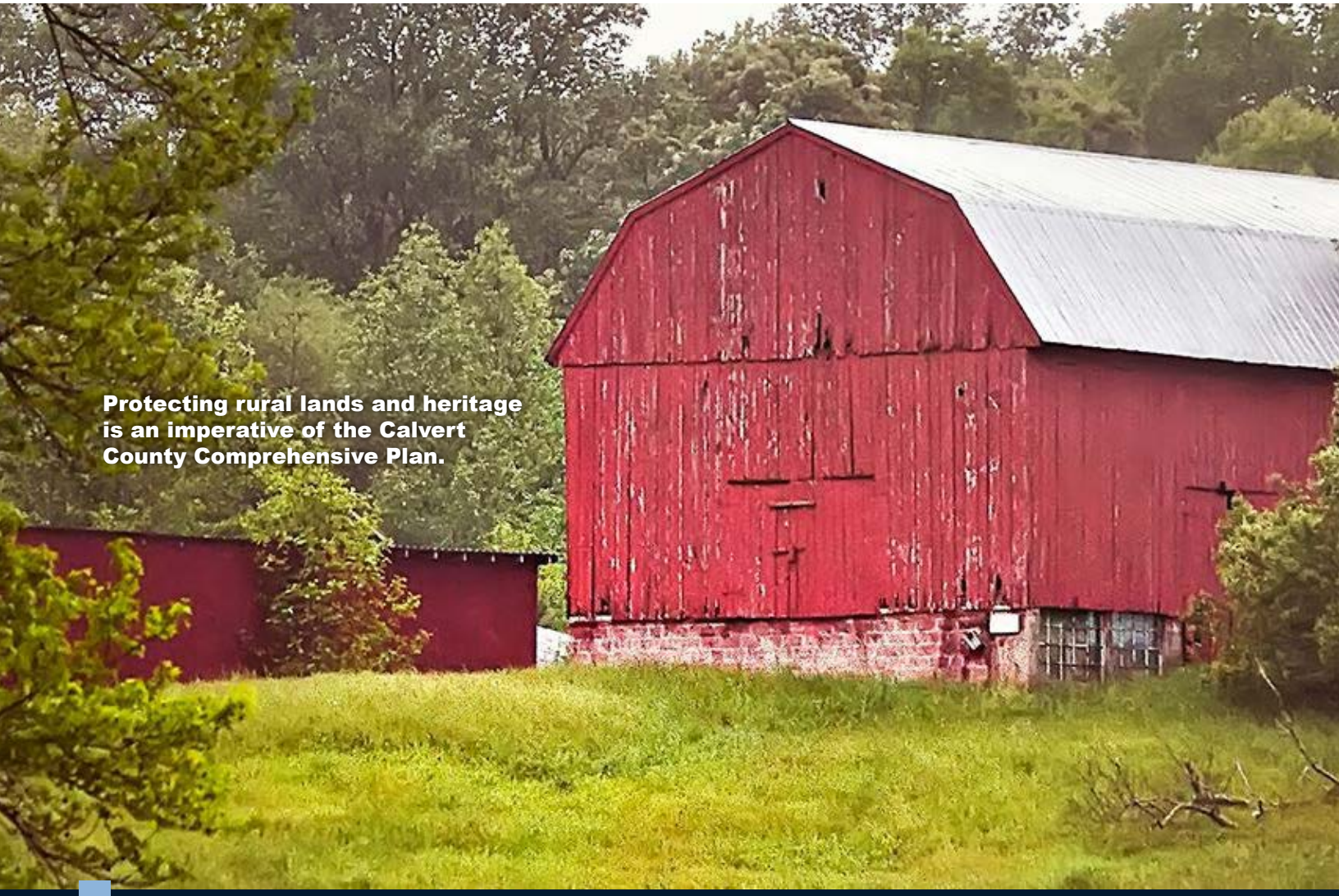
Dispersed Travel Patterns and Lack of Trip Density

While Calvert County has been successful in preserving its rural and agricultural character over the past forty years – even in the face of significant growth in the 1980s and 1990s – development patterns are dispersed such that there is an insufficient number of commuting trips to locations outside of the county. Even if there was a very strong interest from Calvert residents to use a commuter bus service to the state government complex in Annapolis, for example, the total number of commuters to Annapolis is still very small and may not be enough to justify the public investment.

Calvert County has been more successful in meeting its Comprehensive Plan policies of farm and forest preservation than it has in creating vibrant Town Centers. While coming close to meeting the 2010 Comprehensive Plan goal of 35 percent of new households locating inside or within one mile of the Town Centers, Calvert County has not achieved the desired development patterns. The dispersion of residential growth has made it difficult to coordinate and implement transportation improvements that benefit the entire network.

Coordinating Land Use, Growth, and Infrastructure Investments

The County's Adequate Public Facilities (APF) regulations establish a broad process whereby developers are required to mitigate specific traffic conditions to a level of service standard which varies by roadway type and development location. Rather than a coordinated system of improvements as defined in a corridor plan, developers instead build a turn lane or deceleration lane that specifically benefits their new subdivision rather working together with the County to meet a greater need in the development corridor. Tools such as "fee-in-lieu" of location-specific traffic mitigation improvements can be used to create larger-scale road improvements that reduce bottlenecks over a greater area than can be accomplished by one development.



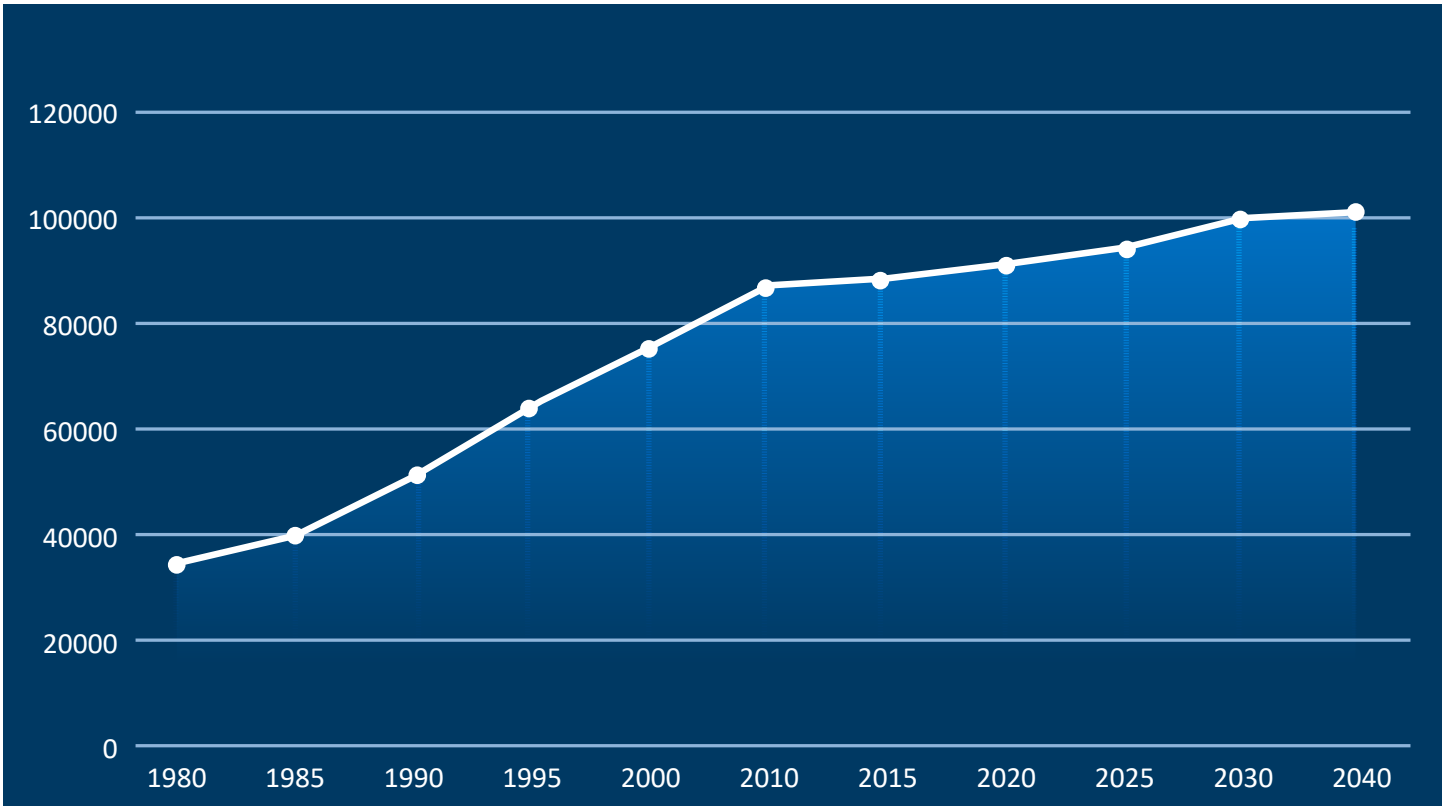
Protecting rural lands and heritage is an imperative of the Calvert County Comprehensive Plan.

The Road Ahead: Forecasting Travel Demand through 2040

Implementation of previous Comprehensive Plan policies has contributed to reducing the county's growth rate for both population and households, which has continually decreased since its peak in the 1970's. Over time, Calvert County has gone from being the fastest growing county in Maryland to one of the slowest in the metropolitan areas. The population growth rate is projected to continue to slow in the future and translates into a reduced growth of households and demand for additional housing units as shown in the following table.

As residential growth has slowed, so too has the growth in traffic volume; however, it can be fairly argued that the transportation infrastructure was never fully built to support the population boom. Accordingly, there are bottlenecks along MD 2/4 and excessive delay occurs at a few intersections which need to be resolved through a variety of traffic operations and road capacity solutions. Forecasting travel demand through 2040 allows state and county planners to objectively evaluate future traffic conditions and to develop and prioritize cost-effective solutions to achieve reasonable and reliable commuting times.

Figure J - Calvert County Actual and Forecasted Population: 1980 - 2040



Source: American Community Survey; Maryland Department of Planning

Scenario-Based Forecasting

Until the past decade or so, the development of county and small area transportation plans has been based on single forecasts of future population, households and employment pegged to a horizon year; however, growth patterns and intensities are influenced by multiple factors: environmental features, the existing transportation network, available utilities, local policies and market conditions. As travel demand data and modeling tools have become more accessible and efficient, it has become easier to prepare and analyze multiple forecasts which evaluate the influence of development intensity and land use patterns on transportation systems.

Based on the potential for development in consideration of protected agricultural lands and forested areas and the prohibition of new septic systems in subdivisions under the State's Agricultural Preservation and Sustainable Growth Act of 2010, three growth scenarios were tested to better understand how the pace and scale of growth would affect the transportation network. Town Center land uses and boundaries of the Comprehensive Plan adopted in 2019 were used as the baseline.

Enhancing the Travel Demand Model for Calvert County

The travel forecasting model used for the Calvert County Transportation is the Metropolitan Washington Council of Governments (MWCOG) is Version 2.3.75 adopted on October 17, 2018. As Calvert County is not a core jurisdiction of MWCOG, the model gives little consideration to land use, environmental factors, and development capacity. The model also uses broad transportation analysis zones (TAZ's) which make detailed analysis difficult at the Town Center level.

To establish a reliable travel demand forecast for 2040, the model was enhanced specifically for Calvert County by:

1. Increasing the number of transportation analysis zones from 46 to 66 thereby allowing for a more fine-grained investigation, especially in the Town Centers.
2. Removing environmentally sensitive areas such as forested lands and steep slopes as potentially developable parcels.
3. Accurately allocating future development capacity (which translates to population, households and employment) to the TAZ's.

Scenario 1: Historical Growth Rate

This scenario uses household growth rate between 2010 and 2017 as reported by the United States Census to project household growth until 2040. Based on these seven years, households can be expected to increase by 12.5% by 2040 to a total population of 101,737. This rate is slightly higher than the forecast by the Maryland Department of Planning which projects 100,450 residents by 2040.

Scenario 2: Aggressive Growth

This scenario projects significantly a 50% growth in households throughout the county through 2040. This growth rate resembles market conditions like the period from the mid-1980s through 2010. During this time period, the county population increased from approximately 34,000 to approximately 88,000 residents.

Scenario 3: Hyper Growth

The scenario projects a maximum build-out by 2040 of all developable residential parcels even when including environmental constraints and growth management programs such as transferable development rights currently in place. A 91.8% household occupancy rate was applied to all buildable residential parcels. This would add approximately 75,000+ residents to Calvert County beyond the population forecast in scenario #1 (historical growth rate).

Table 9 - Projected Population, Housing and Employment Growth Under Three Scenarios

	2017	2019 Plan Historical Growth (2040)	2019 Plan Aggressive Growth (2040)	2019 Plan Hyper Growth (2040)
Households	33,064	35,198	50,642	61,478
Population	93,228	101,737	145,752	176,636
Employment	35,120	35,562	40,784	53,222

Source: Data developed by SAI using models from the Metropolitan Washington Council of Governments and the Maryland Department of Planning

Traffic Conditions Under Most Likely Growth Scenario

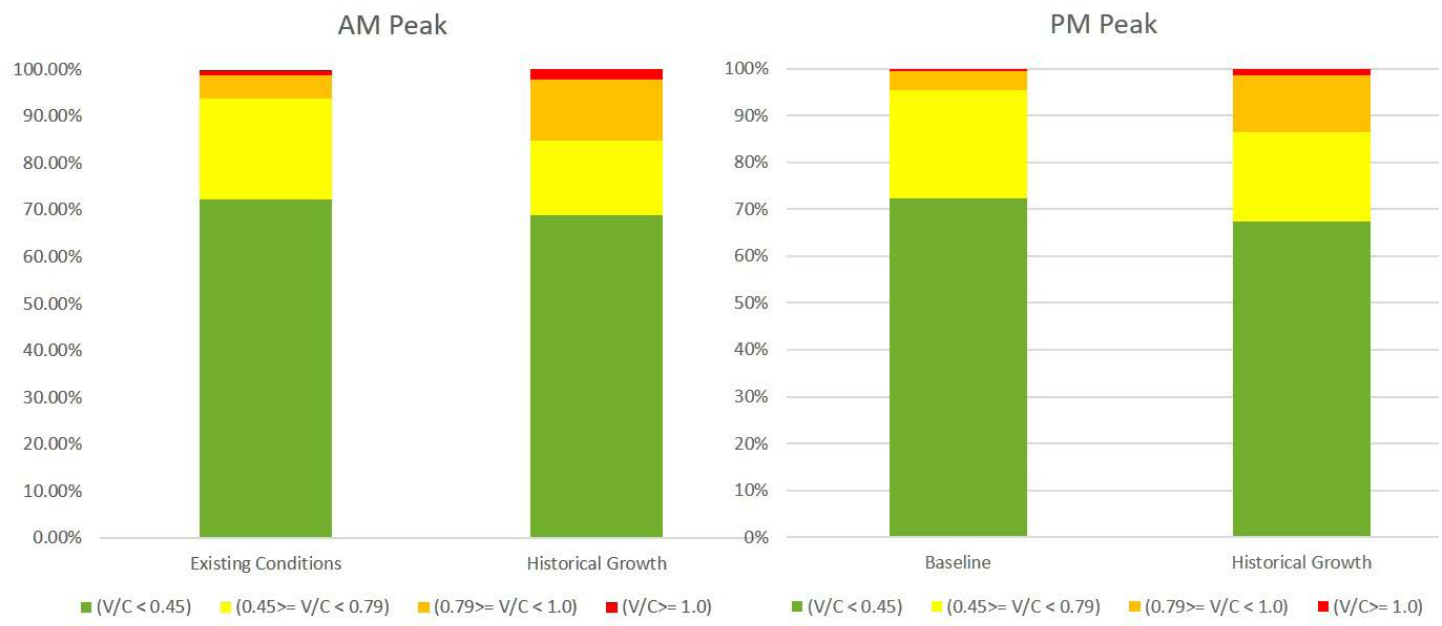
Given market conditions, demographics and distance from the metropolitan areas, the most likely scenario is that Calvert County grows on average by .5% percent per year – or 12.5% over the next twenty years. This rate is slightly higher than but consistent with the 2020 – 2040 growth rate in the 2019 Comprehensive Plan, and the 2020 – 2040 growth rate forecasted by the Maryland Department of Planning.

Systemwide Traffic Speed and Congestion Analysis

The MWCOG travel forecasting model takes into consideration improvements which can reasonably be expected to be constructed through 2040. Two state-funded projects are included: completion of the full MD 2/4 widening through Prince Frederick and widening of the Thomas Johnson Bridge from two to four lanes. A third improvement, completion of Fox Run Boulevard, would be funded locally.

With these improvements made by 2040, there is a very slight overall change in the systemwide directional miles which are congested. In the AM peak, only 2.33% miles exceed capacity vs. 1.08% which exceed capacity in 2017. (Even under an aggressive growth scenario, only 4.14% directional miles would exceed capacity.) In the PM peak period, only 1.39% of all directional miles would exceed capacity in 2040 vs. 0.59% which exceed capacity in 2017. (Again, even in an aggressive growth scenario only 3.47% directional miles would exceed capacity.) As in the current (2017) condition, on a countywide basis when measured against objective industry standards, Calvert's road system in 2040 provides ample capacity for trips made by the forecasted number of residents and workers in Calvert County. That is not to say that there aren't hot spots of congestion at certain times of the day, but overall the system operates very well.

Figure K - Volume to Capacity Ratio on State Roads and Primary County Roads during Morning Peak Hour (7 am - 8 am)



Road segments calculated state roads: MD 2/4, MD 231, MD 506, etc. and major county-owned roads (Cox Road, Ponds Woods Road, etc.) equate to approximately 25% of all road mileage in Calvert County. For reference, see 2017 Maryland Highway Mileage Report from MDOT SHA.

Source: Data developed by SAI using Cube software by CitiLabs. Cube is a regional travel demand model.

Figure L1 - 2017 AM Volume-to-Capacity

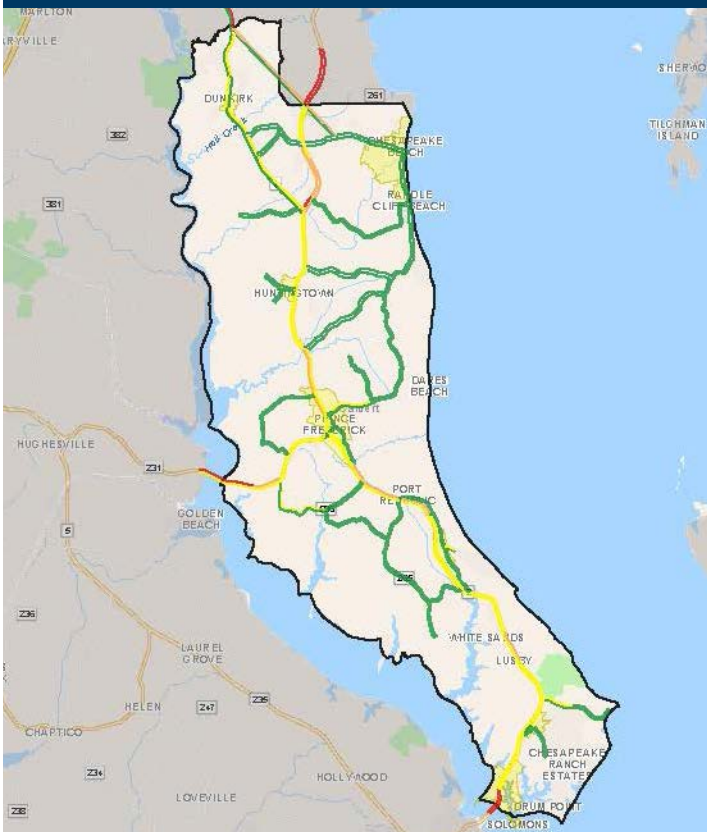


Figure L2 - 2017 PM Volume-to-Capacity

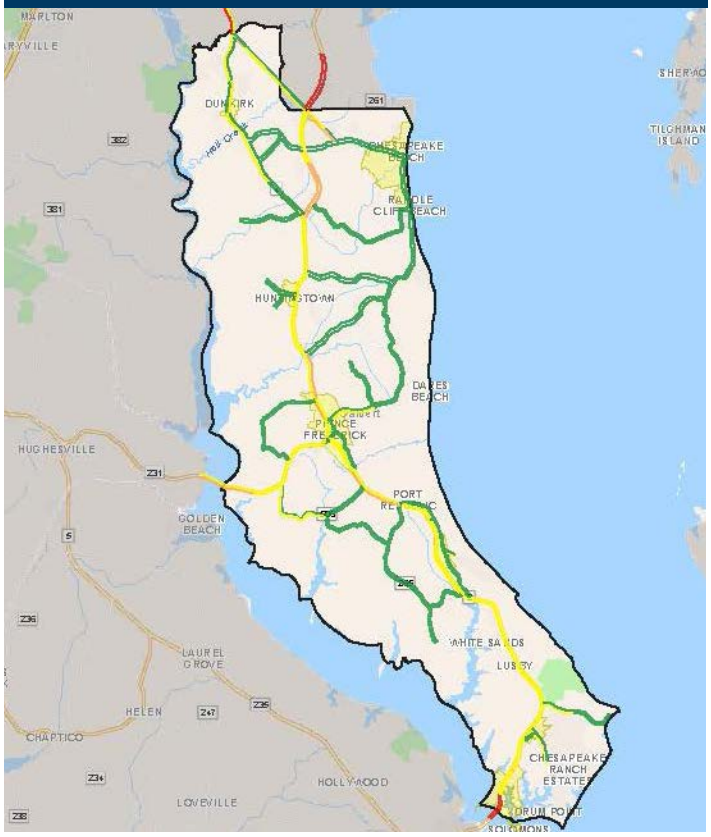


Figure L3 - 2040 AM Volume to Capacity at Historical Growth Rate

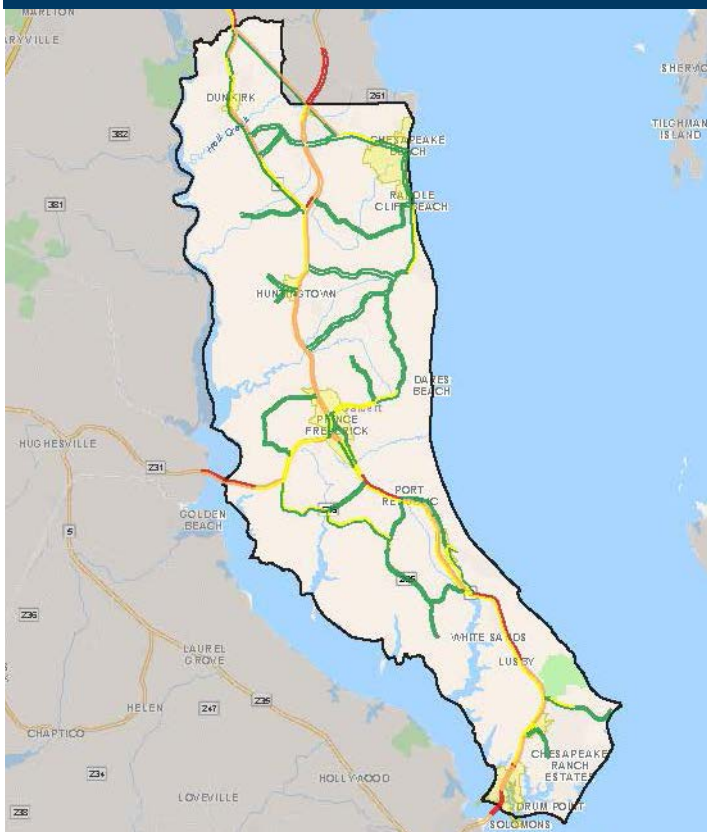
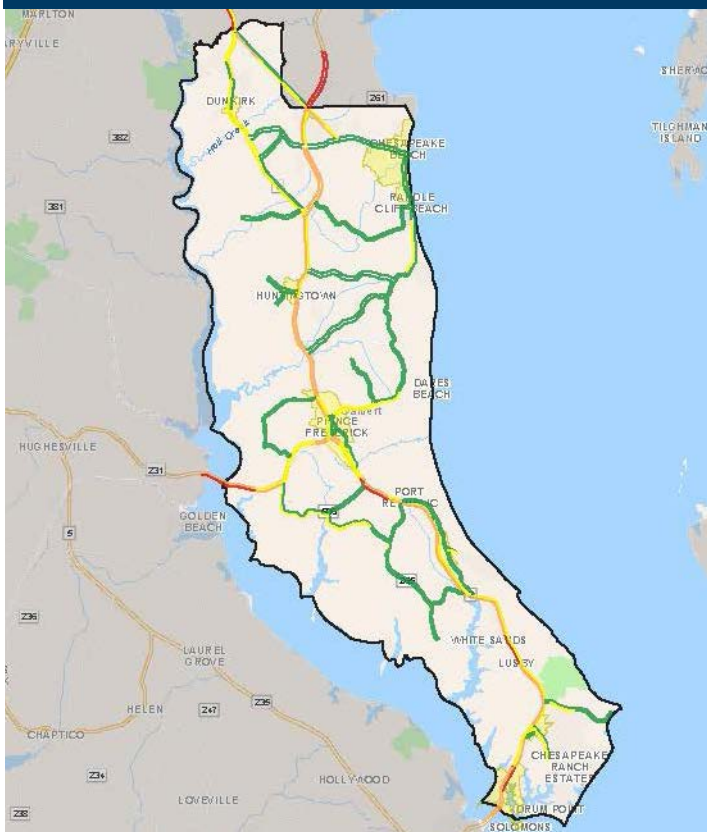


Figure L4 - 2040 PM Volume to Capacity at Historical Growth Rate



Localized Congestion in 2040

As indicated above, there are congestion hot spots forecasted for 2040 within the county. These hot spots occur in the Town Centers and can be mitigated with spot improvements. When operational improvements are made to these intersections (as recommended in the plan under Goal #4), intersection level of service returns to acceptable conditions in most cases. More aggressive solutions may be needed at MD 2/4 at Cox Road and MD 2/4 at Dowell Road[5].

Table 10 - Intersection Level of Service Comparison

Intersection	2017		Historical Growth with MWCOG Improvements*		Historical Growth with MWCOG + Additional Improvements	
	AM	PM	AM	PM	AM	PM
MD 4 @ Ward Rd	C	D	C	E	C	E
MD 2/4 Split	D	C	E	D	E	D
MD 2/4 @ Cox Rd/MD 524	D	F	F	F	D	F
MD 2/4 @ Plum Point Rd/MD 263	C	B	C	B	C	B
MD 2/4 @ Stoakley Rd	C	D	D	F	C	E
MD 2/4 @ Dares Beach Rd/MD 402	C	D	E	F	C	E
MD 2/4 @ Hallowing Point Rd/MD 231/Church St	C	C	C	D	C	D
Adelina Rd/MD 508 @ Hallowing Point Rd/MD 231	B	C	C	D	C	D
MD 2/4 @ Sixes Rd/MD 506 (E/B Approach)	F	F	A	C	A	C
MD 4 @ Broomes Island Rd/MD 264	B	B	B	B	B	B
MD 2/4 @ Calvert Beach Rd	C	D	C	D	C	D
MD 2/4 @ Cove Point Rd	B	C	B	D	B	D
MD 2/4 @ Dowell Rd/Monticello Dr*	C	C	D	F	D	F

**MWCOG Improvements refer to new road capacity projects built into the 2040 travel demand model. Two projects are included: widening of the Thomas Johnson Bridge from 2 to 4 lanes, and , improvements to MD 2/4 at Dowell Road, widening of MD 2/4 through Prince Frederick from 4 to 6 lanes, and completionof Fox Run Boulevard.*
Data developed by SAI using SYNCHRO traffic analysis software. SYNCHRO is a level of service software model for specific intersections or road links.

There are many tools available to transportation planners to improve the level of service (and safety) at congested intersections. Each tool has its own costs and benefits which can only be fully described in the context of planning a specific improvement.

Table 11 - Summary of Traffic Capacity & Management Improvement Tools

Improvement Type	Cost	Time to Implement	Benefit
Grade Separated Interchange	Very High	7-10 years (min)	Reduce mainline delay, improve reliability and safety
Roadway Widening	High	5-7 years	Reduce mainline delay
Access Management	Low	1-2 years	Reduce mainline delay and improve safety
Intersection Approach/Turn Lanes	Low	1-2 years	Reduce turning delay
Traffic Monitoring/Signal Timing	Very Low	2-6 months	Improve reliability and reduce delay
Traveler Information Systems	Moderate	1-2 years	Alternate routing
Commuter Transit	Low	6 months-1 year	Choice

[5] *Improvements to MD 2/4 at Dowell Road are assumed to be included with widening of the Thomas Johnson Bridge from 2 to 4 lanes.*

The Plan: Strategic Transportation Policies and Investments for Calvert County

Goal 1: Build and maintain transportation assets that are safe, resilient, and in good repair.

The County's first responsibility is to keep its assets safe and well maintained. The most obvious (and most expensive to maintain) transportation assets are roads and bridges; culverts and stormwater management facilities, fences and guardrails, signs, transit vehicles and maintenance facilities are also part of the asset inventory. The county's operating and capital budgets have usually given priority to maintenance and safety, although there is always more to be done. A lifecycle asset management approach will provide the county with a solid foundation from which to monitor the transportation system and optimize the preservation, upgrading, and timely replacement of transportation assets through cost-effective management, programming, and resource allocation decisions. It is a systematic process of maintaining, upgrading, and operating physical assets cost-effectively, throughout their lifecycles.

Objective: Calvert County's roads, bridges, and culverts will be maintained in a state of good repair as established by local standards.

Strategies:

- Establish a full condition inventory of the County's roads, bridges and culverts in Calvert County and define appropriate maintenance standards for each type of road, bridge and culvert.
- Develop a reasonable ten-year lifecycle maintenance plan for county collector and arterial roads.
- Allocate and program operating and capital maintenance resources for roads, bridges and culverts based on the risk to public safety and the economy. Risk should consider, at a minimum, traffic volume, safety record, structural condition, paving and subsurface conditions, and skid resistance of existing surfaces.
- Replace county transit vehicles in accordance with useful standards established in the Maryland Transit Asset Management Plan.

Objective: Improve drainage along roadways that have recurring flooding or maybe susceptible to storm surges.

Strategies:

- As part of the road, bridge and culvert condition inventory and guided by the County's All-Hazards Mitigation Plan, conduct hydrologic and hydraulic studies of key roadways and bridges.
- Replace, remove, or enlarge bridge and culvert stream crossings that are unable to pass the 10-year frequency flood flow.
- Maintain an aggressive program of debris removal from stream channels in the vicinity of bridges and culverts; monitor erosion and other indications of roadway undermining.
- Retrofit and modernize drainage channels along the most at-risk roadways.
- Pursue FEMA funding and other federal funding opportunities for pre-disaster mitigation.
- Monitor the adequacy of evacuation routes and revise or update as necessary.

More than 30 road segments are frequently flooded during major rainfall.

Source: Calvert County Division of Emergency Management

Goal 2: Eliminate traffic and pedestrian deaths and serious injuries.

Transportation-related deaths and severe injuries are preventable and unacceptable. Rural communities like Calvert County are increasingly adopting a Vision Zero strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. Vision Zero is a systems-oriented approach to safety and is founded on the following principles:

- Transportation–related deaths and severe injuries are preventable and unacceptable.
- Human life takes priority over mobility and other objectives of the road system. The road system should be safe for all users, for all modes of transportation, in all communities, and for people of all ages and abilities.
- Human error is inevitable; the transportation system should be designed to anticipate error so the consequences are not severe injury or death. Advancements in vehicle design and technology, as well as roadway engineering advancements, personal electronic device innovations, etc., are necessary components for avoiding the impacts of human errors.
- People are inherently vulnerable, and speed is a fundamental predictor of crash survival. The transportation system should be designed for speeds that protect human life.
- Safe human behaviors, education, and enforcement are essential contributors to a safe system.
- Policies at all levels of government need to align, making safety the highest priority for roadways.

While state and federal policies focus on driver licensing requirements, vehicle crashworthiness, and curbing antisocial behaviors like texting and driving or driving while under the influence of alcohol or other substances, a local government's Vision Zero plan typically focuses on:

- Engineering improvements such as reducing speeds, warning of hazards, fixing blind spots and dangerous intersections and improving street lighting.
- Educational activities such as Safe Routes to Schools program and bicycle safety programs.
- Enforcement of traffic laws with an emphasis on combating speeding, aggressive and impaired driving.
- Integrated transportation-land use planning and development reviews that put pedestrian safety and multimodal access ahead of traffic speed and maximum vehicle access points

Objective: Improve data collection and dissemination to target enforcement activities to the highest causes and locations of traffic crashes.

Strategies:

- Establish a systematic, data-driven process to improve traffic safety on county roads; strategies should include both physical improvements and behavioral approaches (enforcement, education, etc.)
- Conduct routine data sharing and safety planning efforts among County and State agencies including the Calvert County Sheriff's Office and the Departments of Public Works, Planning & Zoning; Fire, Rescue and Emergency Management Services; MDOT State Highway Administration; Maryland State Police and community resources such as Calvert Alliance Against Substance Abuse.

Table 12 - Frequent crash locations on county-owned roads

Mason Road
Little Cove Point Road
Mt. Harmony Road
Parran Road
Pond Woods Road
Skinner Turn Road
Wilson Road
Prince Frederick Blvd @ W. Dares Beach Road

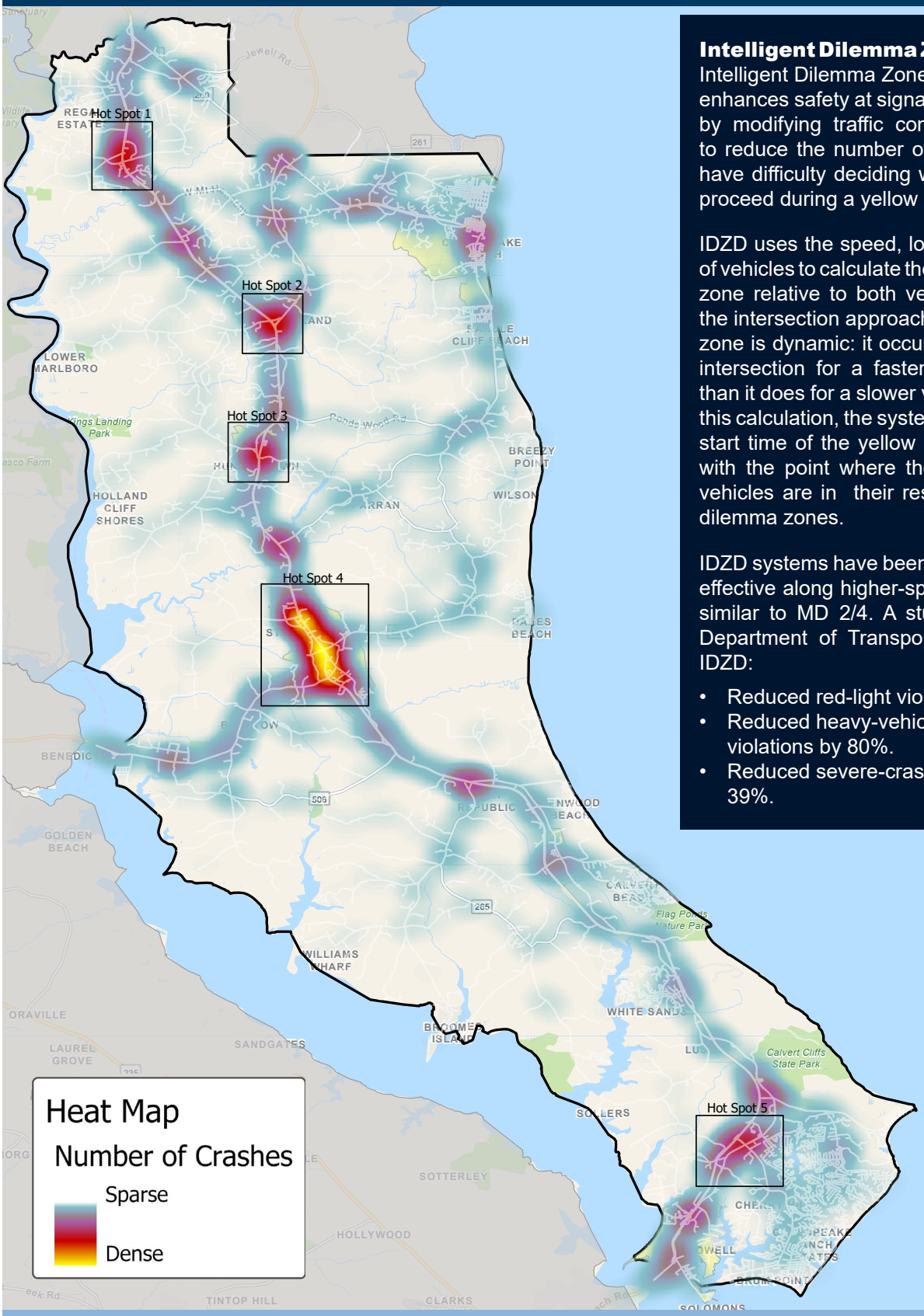
Source: Maryland Highway Safety Office, 2017

Objective: Maintain a continuous pipeline of traffic safety and pedestrian improvements.

Strategies:

- Request that MDOT SHA conduct or expand its pilot program on intelligent dilemma zone protection to one or more high speed intersections along MD 2/4.
- Include an annual request in the CTP Priority Letter to ensure that MDOT SHA includes Calvert County locations in its Crash Prevention Program.
- Analyze and design improvements on County-owned roads with the highest number of injury crashes.

Figure M - Frequent crash locations on state-owned roads (See pages A9-A14 of Appendix for Hot Spot details)



Intelligent Dilemma Zone Detection

Intelligent Dilemma Zone Detection (IDZD) enhances safety at signalized intersections by modifying traffic control signal timing to reduce the number of drivers that may have difficulty deciding whether to stop or proceed during a yellow phase.

IDZD uses the speed, location, and length of vehicles to calculate the location dilemma zone relative to both vehicle speeds and the intersection approach (i.e. the dilemma zone is dynamic: it occurs farther from the intersection for a faster traveling vehicle than it does for a slower vehicle.) Based on this calculation, the system then adjusts the start time of the yellow phase to coincide with the point where the fewest possible vehicles are in their respective projected dilemma zones.

IDZD systems have been found particularly effective along higher-speed rural arterials similar to MD 2/4. A study by the Texas Department of Transportation found that IDZD:

- Reduced red-light violations by 58%.
- Reduced heavy-vehicle red-light violations by 80%.
- Reduced severe-crash frequency by 39%.

Source: Maryland Highway Safety Office

Goal 3: Improve Mobility within Town Centers.

The Town Center planning process will allow residents, businesses and County agencies to develop a specific plan of action to improve mobility therein; however, the right planning framework, policy tools, guided investments will be needed to do so.

Objective: Reduce the need for local traffic to use MD 2/4 within and approaching the Prince Frederick, Huntingtown and Dunkirk Town Centers.

Strategies:

Prince Frederick

1. Add a second exclusive turn lane eastbound on Stoakely Road to MD 2/4 northbound.
2. Make the final connection of Prince Frederick Boulevard to MD 2/4 and realign the northernmost entrance/exit from Calvert Memorial Hospital.
3. Extend Chesapeake Boulevard to meet Harrow Lane, then connect to Calvert Memorial Hospital.
4. Complete Fox Run Boulevard.
5. Examine and implement operational and safety improvements on MD 231 between the College of Southern Maryland Prince Frederick Campus and Sixes Road.

Huntingtown

Realign junction of MD 521/ MD 524 and MD 2/4 in Huntingtown to allow for continuous movements wherever possible

Dunkirk

Identify a loop road alignment or parallel connection to the west of Dunkirk District Park between Smithville Road or Ferry Landing Road/Town Center Boulevard or Yellow Bank Road.

Figure N1 - Prince Frederick Improvement Concept

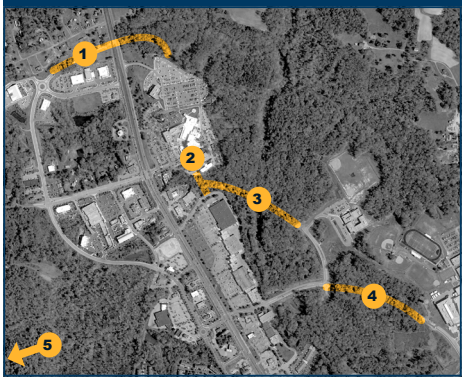


Figure N2 - Huntingtown Improvement Concept

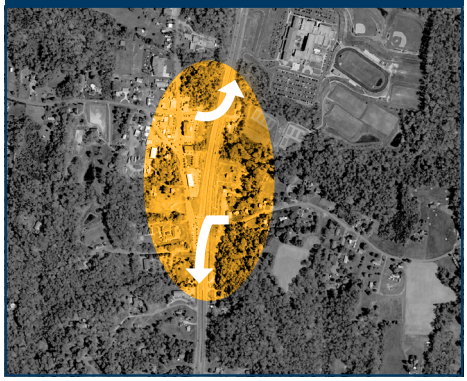


Figure N3 - Dunkirk Improvement Concept

Objective: Upgrade the bicycle and pedestrian network.

Strategies:

- Update the Calvert County Road Ordinance and subdivision regulations to require sidewalk connectivity from the subdivision to the nearest logical termini within Town Centers. If right-of-way acquisition is required from property owners other than the subdivision developer, accept in-lieu of sidewalk construction while the county acquires the right of way; or, complete a similar length section of sidewalk in another part of the Town Center.
- Fill key gaps in the pedestrian network along MD 2/4 by prioritizing MDOT SHA Sidewalk Retrofit Program requests.
- Examine opportunities to improve pedestrian access to schools using the Safe Routes to Schools program model.
- Advance multi-use paths which primarily serve a transportation purpose as described in the Calvert County Land Preservation, Parks and Recreation Plan (LPPRP.)

Objective: Strengthen policy and financial tools to guide targeted investments.

The Calvert County Zoning Ordinance (CCZO) provides for an adequate public facilities test (commonly known as an "APF") to evaluate the extent to which existing roadways can accommodate new residential, commercial or industrial development. The Zoning Ordinance requires that a traffic impact study be conducted and establishes a level of service standard which varies by roadway type and development location. Developments subject to APF regulations may not be permitted unless the developer mitigates the additional traffic brought by the development; APF grants the Director and grants the Director of Public Works broad authority to determine mitigation measures to achieve adequacy.

In theory, APF should provide a mechanism to manage and maintain the transportation system for traffic added to the network by new development. In practice, this is much more difficult to achieve because the scale and timing of developments and transportation improvements rarely match. For example, a subdivision of 60 residential units in the Prince Frederick Town Center hardly generates enough excise tax revenue to even begin engineering the improvements envisioned by this transportation plan, much less build the improvements. Requiring a developer to mitigate the additional traffic volumes back to a pre-development level of service (turn lanes, traffic signals, non-motorized improvements, etc.) is economically infeasible for developments at the scale built in the Town Centers.

Strategy:

Department of Public Works and Department of Planning & Zoning should study the development process and legal issues of APF to determine if a "fee-in-lieu" approach should be implemented or excise tax increased for a dedicated purpose within Town Centers. As each Town Center master plan is prepared, the transportation element can be used to establish the extent and timing of improvements which are necessary, and the County should then set a fair per unit fee to be paid by building permit applicants. These fees can be used to leverage county and state funding for improvements.

Figure O1 - Prince Frederick Priority Sidewalk Improvements

Figure O2 - Dunkirk Priority Sidewalk Improvements

Goal 4: Expand practical choices and achieve reliable travel times for commuters using MD 2/4.

More so than the actual travel time and distance, drivers nationally cite the reliability of their commute as their most significant concern. Drivers are used to congestion and they expect and plan for some delay, particularly during peak driving times but they are less tolerant of unexpected delays because they cause the traveler to be late for work or important meetings, miss appointments, or incur extra childcare fees. Shippers that face unexpected delay may lose money and disrupt just-in-time delivery and manufacturing processes. When the daily grind of a long commute becomes too much, drivers also want practical and reliable alternatives to driving alone such as carpooling and commuter buses.

Objective: Gather and disseminate timely intelligence on traffic conditions along MD 2/4.

Strategies:

If you can't measure it, you can't improve it – and unfortunately, there is very little systemic monitoring and measurement of traffic congestion in Calvert County which makes it difficult to improve the situation. For individual drivers, mobile applications such as Waze and Google Maps help drivers to find the fastest route to their destination, but they are no substitute for active management of traffic along an entire corridor.

MDOT SHA should:

- Include MD 2/4 in the annual Maryland Mobility Report.
- Place traffic cameras, speed sensors and other real-time data collection tools along MD 2/4.
- Install variable message signs on MD 4 northbound in advance of MD 231 and the MD 2/4 split.

Dynamic message signs provide advance information on traffic conditions.

Objective: Deploy intelligent transportation technologies to improve travel time reliability on MD 2/4.

Maryland is executing a multi-phase traffic relief plan that involves a combination of geometric roadway capacity increases and installation of a 'Smart Signal System' on critical corridors throughout the state. These systems use real-time data to dynamically adapt signals to variable traffic demand. Using these systems, roadways that require additional vehicular capacity will receive more time when they needed it for throughput, effectively reducing delay experienced system wide. MDOT SHA should include MD 2/4 in the next round of Smart Signals corridors and Intelligent Dilemma Zone Detection locations.

Establishing an Intelligent Transportation Systems Backbone in Calvert County

Technology has been long-embraced at the state and local levels in Maryland, although certain corridors have been of greater focus than others. Numerous plans and programs have been established which embrace the approach that technology is one of the strongest tools to manage and mitigate growing traffic congestion. Beyond just roadways and traffic signals, a smart and technology-enabled transportation system requires a network of infrastructure including data collection equipment, communications equipment, data storage, monitoring systems, and dedicated maintenance staff. Together, these assets provide information that can aid in decision making and serve as tools to better manage traffic congestion when it occurs.

Calvert County's Comprehensive Plan calls for the continued development of a broadband network for use in a variety of applications. This network could be leveraged to achieve greater communications capabilities with transportation technology.

Objective: Jointly develop and implement an access management plan for MD 2/4 with MDOT SHA.

Access management plans are used as a guide for State and local agencies in providing a consistent means to address the requests for access from development/redevelopment properties along state highway corridors. The goal is to develop plans that will allow for economic growth and rational development while maintaining or improving mobility, safety and capacity of the existing roadway. The SHA and local governments are actively developing plans and access guidelines along selected highway corridors to prepare for development taking place today or many years in the future. The most common misconception of a draft access management plan is that it will be implemented immediately, and property owners will lose existing access to the highway. This is not the case. These Access Management Plans are flexible and will be implemented through the local development process. There will be circumstances that will lead to changes in the proposed approach in an area. Each property will be examined independently to determine its relationship to the plan/policy and what is needed to maintain a corridor.

MDOT SHA and Calvert County should work together to develop an access management plan and use the development review and approval process to use tools such as:

- Rejecting new private entrances along MD 2/4 or issue “temporary” private access permits, pending location of future alternate access.
- Consolidating existing private entrances so that adjacent properties share common driveways.
- Limiting the location and number of median openings.
- Restricting turning movements into and out of properties which limits the number of conflict points at driveway locations.
- Allowing access to corner parcels only from lower functioning roadways.

Objective: Expand commuter bus service to reflect the actual travel patterns of County residents.

Recent data from the U.S. Census indicates that travel to and from the core of Washington, DC is remaining steady, while travel from Calvert to northern Prince George’s County (College Park), Anne Arundel County (Annapolis/Parole), Montgomery County (I-270 corridor) and Northern Virginia (Alexandria/Pentagon) is rising.

As such, commuter bus service to and from Calvert County should be reviewed by MDOT MTA and consideration given to:

- New service from Prince Frederick to state office complexes in the downtown Annapolis government center.
- New service to federal facilities in northern Prince George’s County (New Carrollton, Greenbelt and College Park.)
- Restructuring certain routes to connect from Prince Frederick/Dunkirk to Alexandria, Virginia and the Pentagon.

As an interim step, MDOT MTA should consider establishing and subsidizing subscription-based van pool service to the above-named destinations.

MDOT MTA Commuter Bus service to Washington, DC is a practical commuting alternative for many.

Calvert County park-and-ride locations are often filled to capacity.

Goal 5: Meet Unmet Transportation Needs for Calvert County's Carless and Limited-Mobility Households.

Calvert County lacks the density to support a robust network of local transit routes resulting in service that is very infrequent and with days and hours of service that do not meet the full needs of county residents in need of transportation assistance. This problem is not unique to rural communities and has a significant impact upon seniors and individuals with disabilities who need access to doctors' appointments, fresh foods, and social services. Seniors who can no longer drive but wish to remain an active part of the community through volunteering, pursuing a hobby, or attending civic events are also affected by the limited transit availability; some human services providers have vans bought through a federal grant program administered by MDOT MTA, but eligibility is limited to clients of the service. A volunteer-driven program to assist seniors with door-to-door transportation led by Partners in Care withdrew from Calvert County in 2017 reducing the options, especially for discretionary trips.

Low-income households also struggle to access similar services and opportunities and face the challenge of not being eligible for many of the programs otherwise available to seniors and individuals with disabilities. When such households do have a car, the reliability of the vehicle is often in question making it more difficult to show up for work on time.

Objective: Establish small-scale programs to provide transportation services to the elderly, disabled and low-income individuals seeking work.

Strategies:

The Tri-County Council of Southern Maryland should:

- Re-establish or develop a network of volunteer drivers to meet the discretionary and/or off-peak trips for seniors and individuals with disabilities.
- Recruit a non-profit organization to Southern Maryland to provide a Wheels to Work-like program which restores vehicles and makes them available at low cost to eligible residents.
- Encourage the College of Southern Maryland and other career technology education programs to link their training programs to assist low-income persons in routine auto maintenance and repairs.

Objective: Improve connections between areas with concentrations of low-income, auto-less households & commercial employment centers.

Strategies:

- Establish on-demand or subscription-based evening bus service hours to reflect hours of operation of major retail centers in Prince Frederick and Dunkirk[6].
- Establish a minimum service standard of 60 minutes for fixed route services to and from Prince Frederick.
- Examine periodic fare increases consistent with MDOT MTA policies and/or increasing county funds to support local transit service.
- Defer investment in a new transit center until such time as service levels warrant it.

The Howard County all-volunteer NeighborRide program is a model program for senior citizen mobility.

Calvert County Public Transportation provides a valuable service for local trips.

[6] *Subscription-based service" refers is a method of establishing ridership by allowing a user to pay fee for a certain number trips per month as needed rather for than a full monthly transit pass. A subscription allows the transit agency to operate service where demand may be too low for a traditional fixed-route, fixed-schedule bus route.*

Conclusion and Path Forward

Calvert County's Comprehensive Plan establishes two planning imperatives: preserve the rural landscape and create vibrant Town Centers. These values work together and mutually sustain each other. The resulting land use and development must be supported by a transportation system that reinforces these values. This comprehensive countywide transportation system tries to achieve a balance that supports the measured growth approach in the comprehensive plan. The challenge that must be addressed in doing so is this: providing too much road capacity for free-flowing traffic which will encourage more development by retaining a travel time to employment centers that is acceptable to commuters; providing too little road capacity (especially within and approaching the Town Centers) frustrate the desire of residents to move freely and safely within the county.

Road capacity is but one issue. The county has responsibility to maintain existing roads, bridges and culverts in a state of good repair and resilient to the pressures of climate change, to provide services for carless and limited mobility populations, and to advocate for improvements to state roads and transit services to better keep Calvert County moving.

The primary constraint on achieving the transportation goals and objectives of this plan is funding. MDOT is making considerable investments in mega-projects in the metropolitan areas where traffic congestion is far worse than in Calvert County and other rural areas. Calvert County spends relatively little on providing new transportation capacity and focuses its resources on maintaining the existing transportation system. If new transportation capacity is to be built, it will require a partnership between the county and state with participation from developers adding new trips to the transportation system. Reorienting the county's adequate public facilities regulations to accumulate fees from developers rather than very small improvements may be the best approach to gain developer participation.

Building new roads is a lengthy process, and expensive in dollars and environmental effects. As such, the most promising strategy for the county is not to focus on building new lanes on existing roadways, but rather to focus on operational, safety and technological improvements which have high value at relatively low cost. Most of the roadway improvements should be further developed as part of the Town Center planning process – both to establish an appropriate design for the improvement as well as to set thresholds for when the improvement should be built.

Appendix

Huntingtown Sidewalk Network Map

Source: Data collected by SAI, April 2019

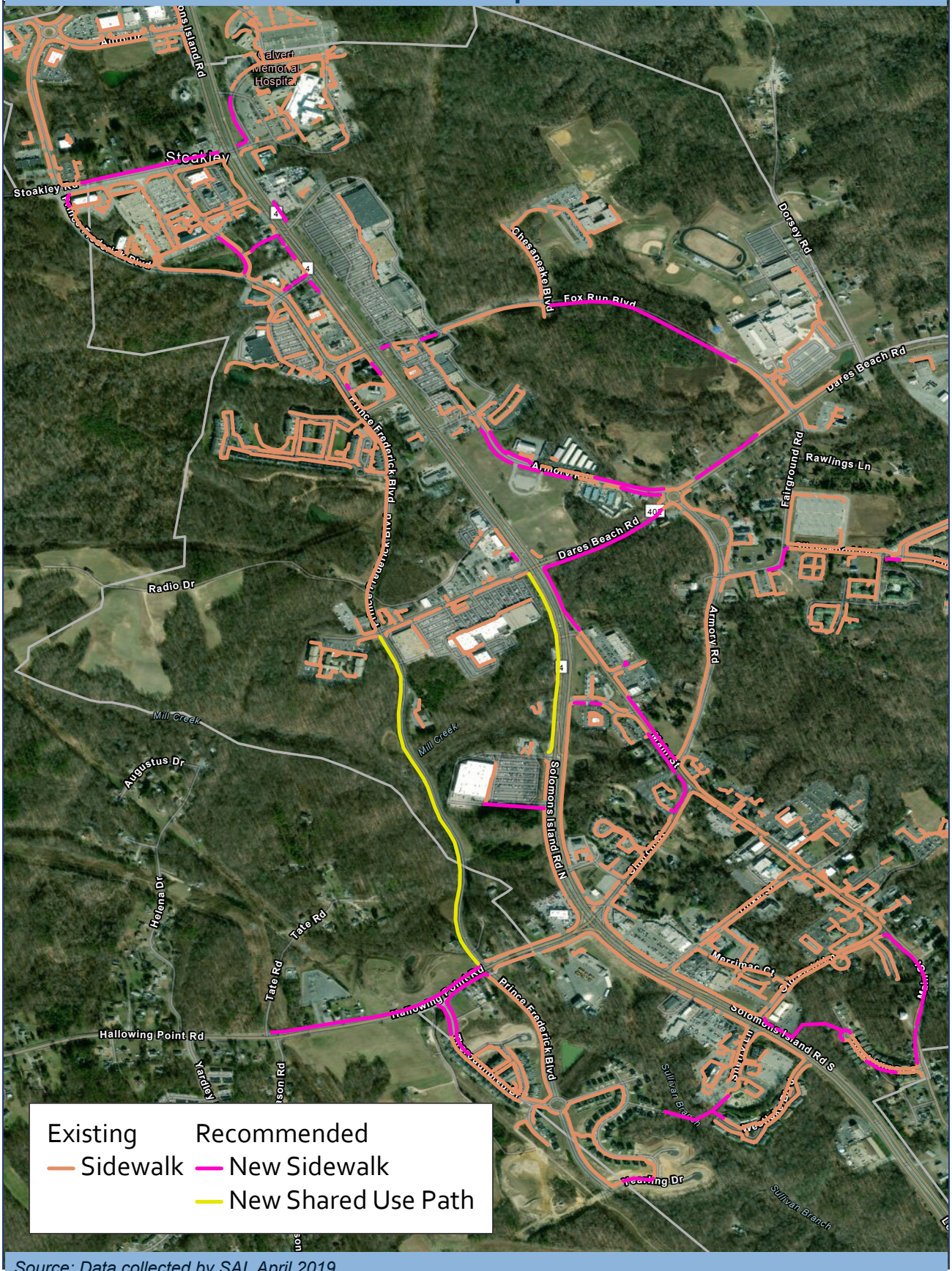
Lusby Sidewalk Network Map

Source: Data collected by SAI, April 2019

Owings Sidewalk Network Map

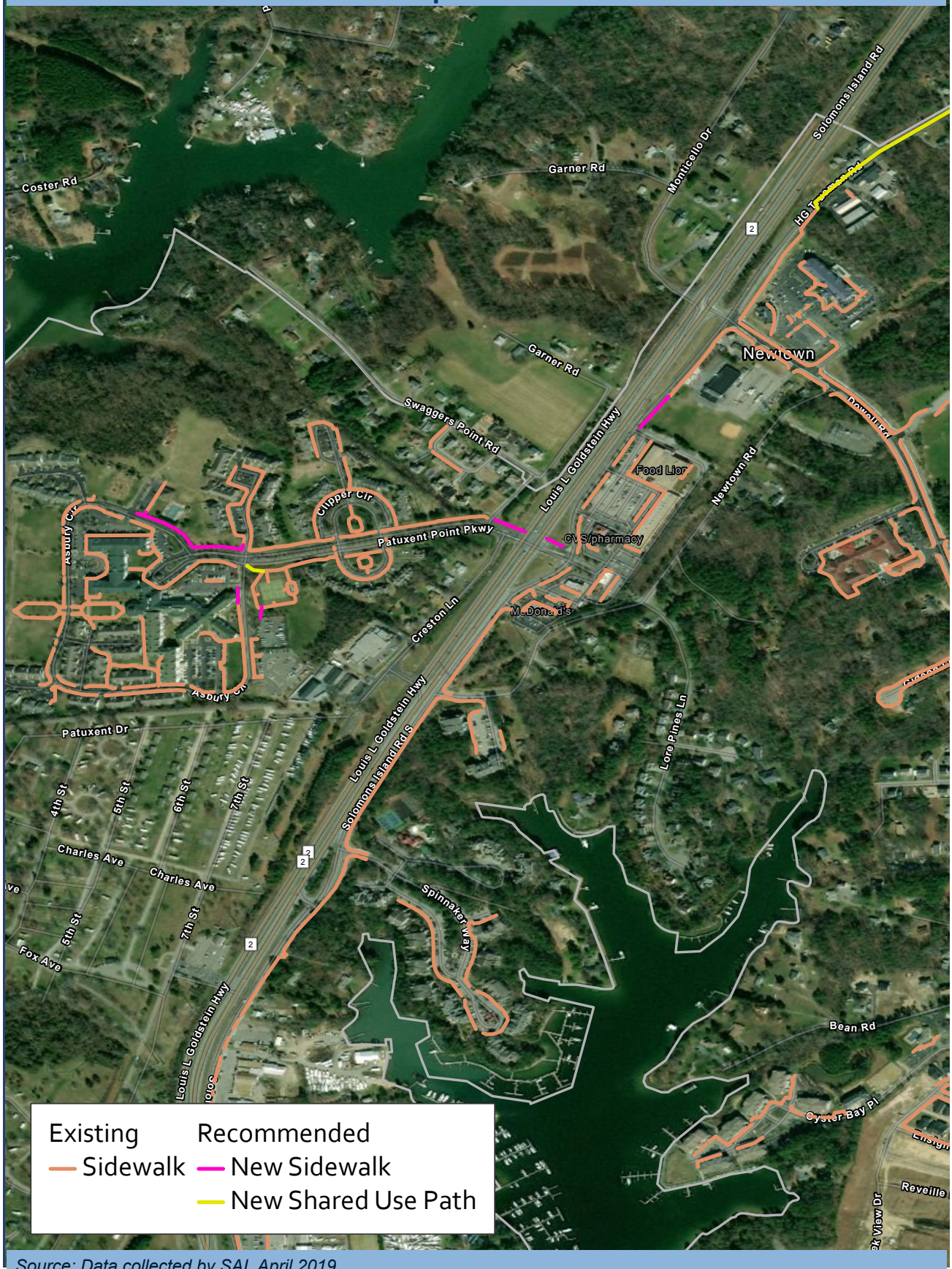
Source: Data collected by SAI, April 2019

Prince Frederick Sidewalk Network Map



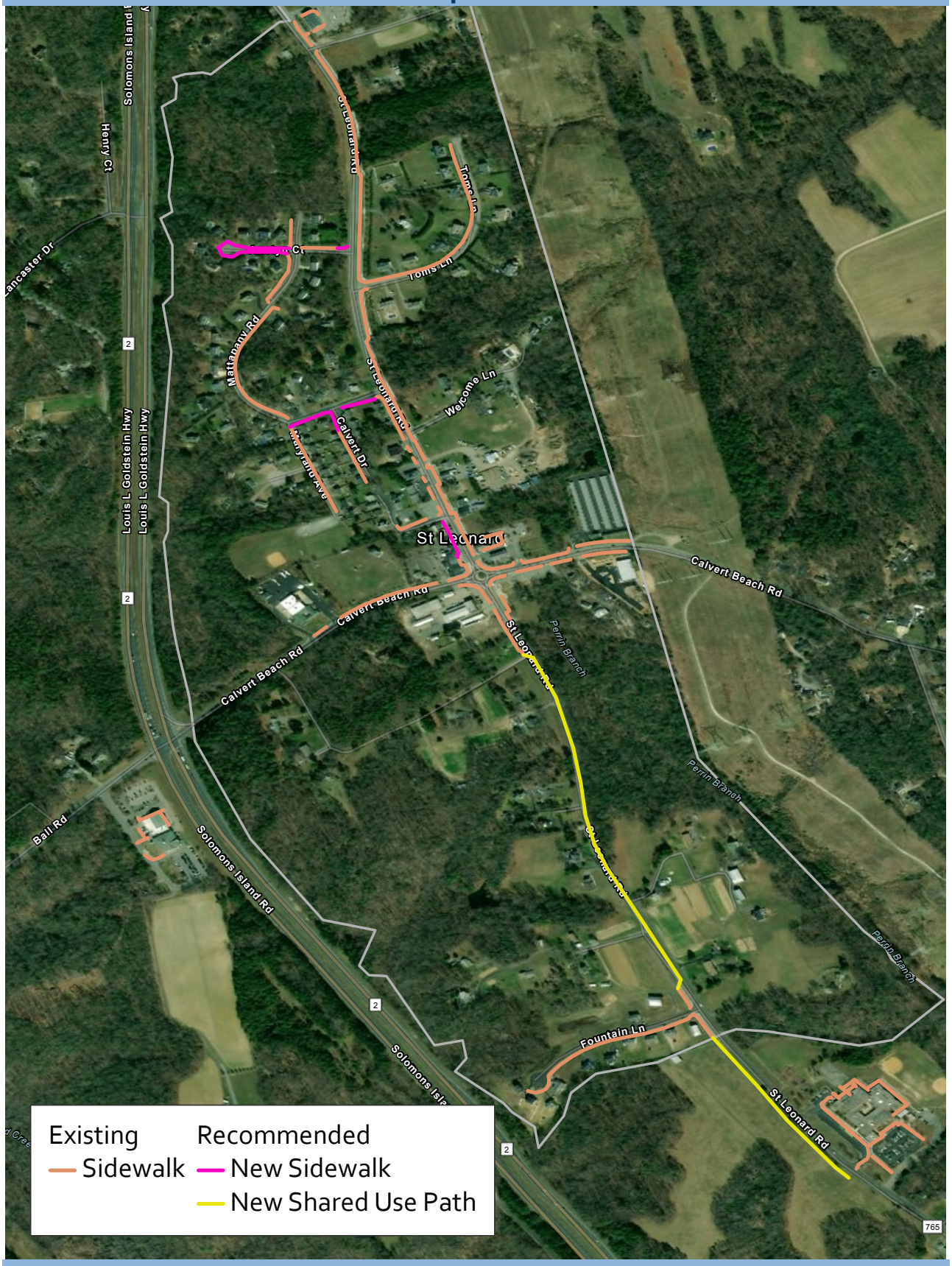
Source: Data collected by SAI, April 2019

Solomons Sidewalk Network Map



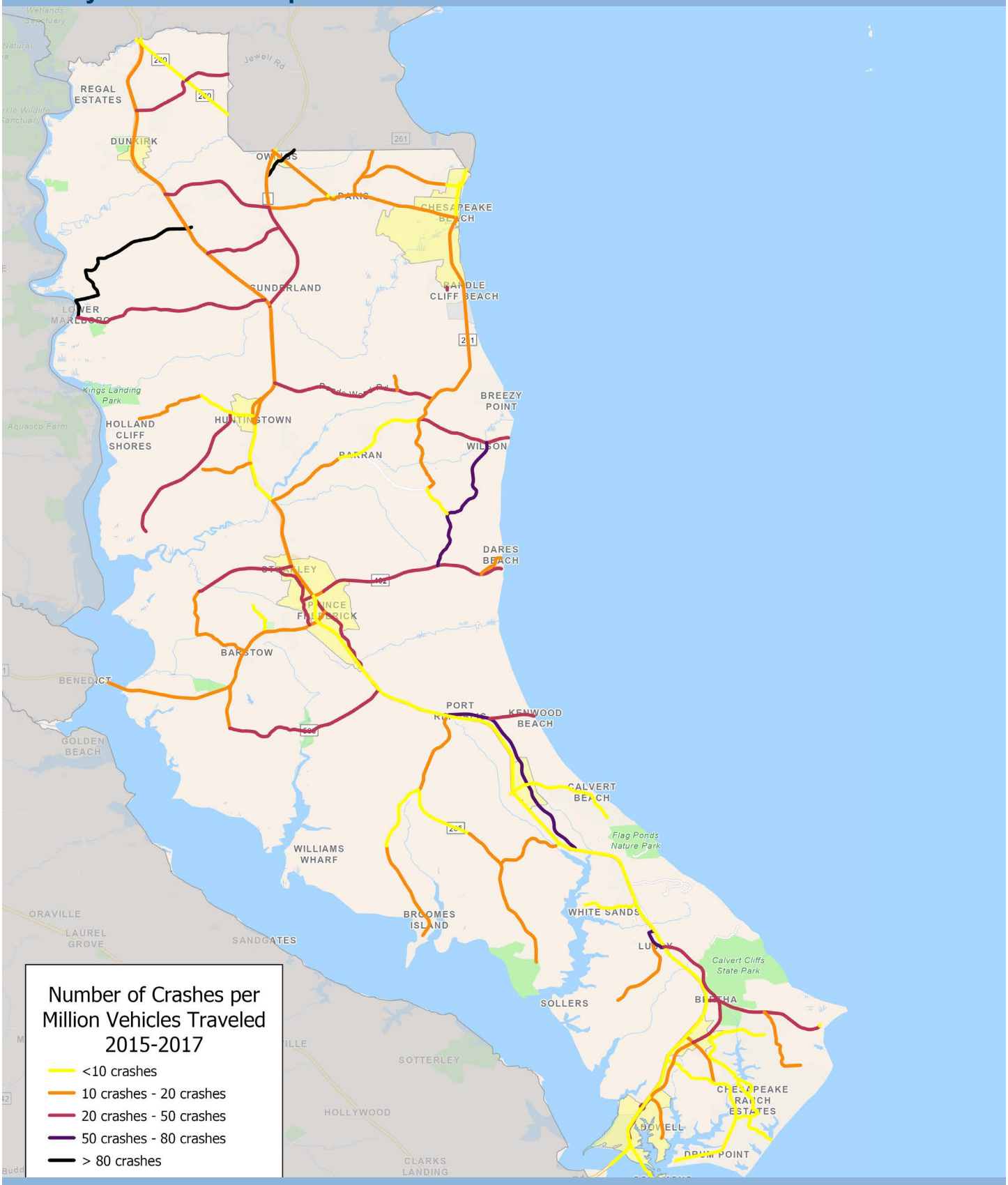
Source: Data collected by SAI, April 2019

St. Leonard Sidewalk Network Map



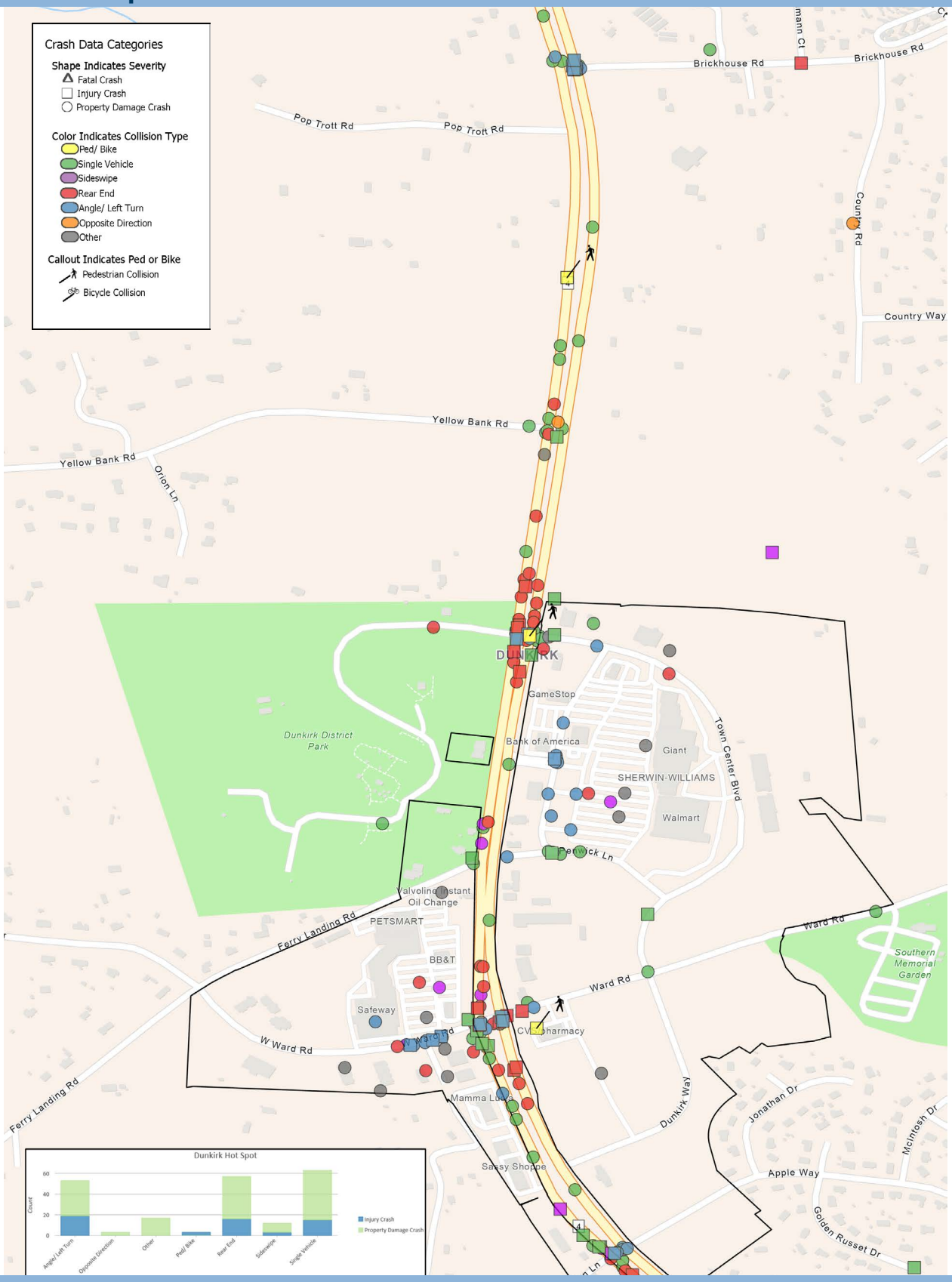
Source: Data collected by SAI, April 2019

County Crash Rate Map



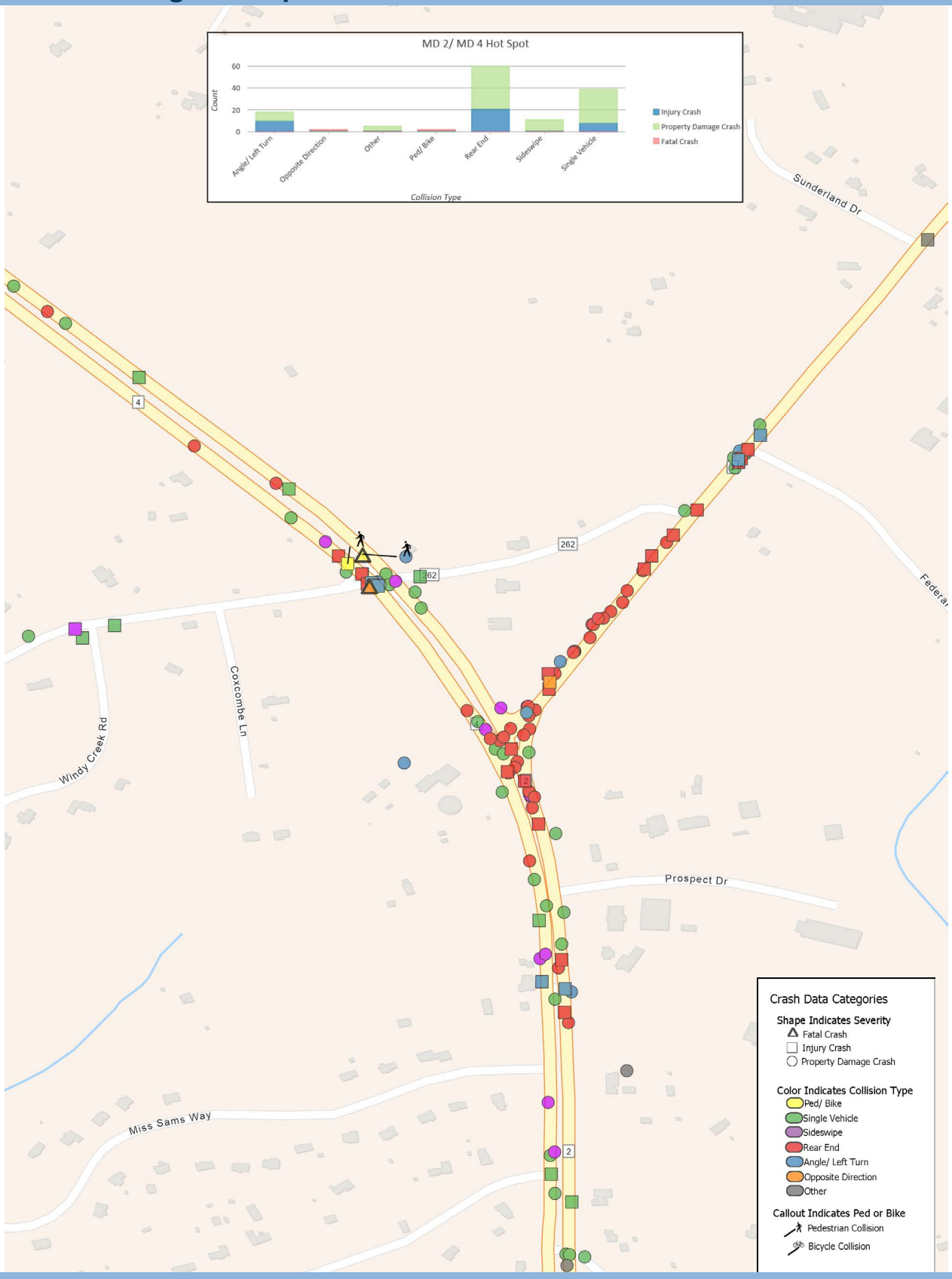
Source: Maryland Highway Safety Office

Dunkirk Hot Spot



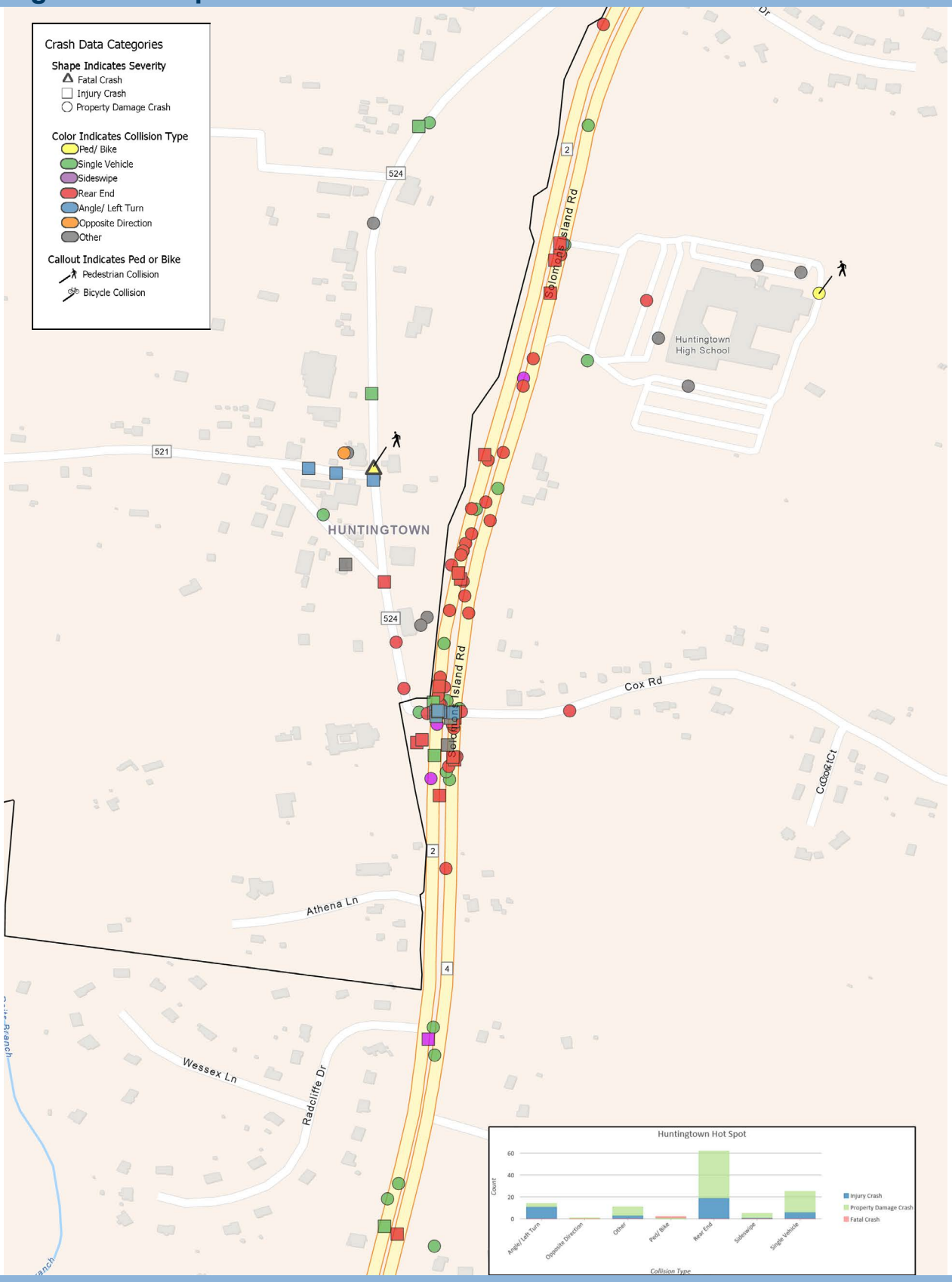
Source: Maryland Highway Safety Office

MD 2/4 Interchange Hot Spot



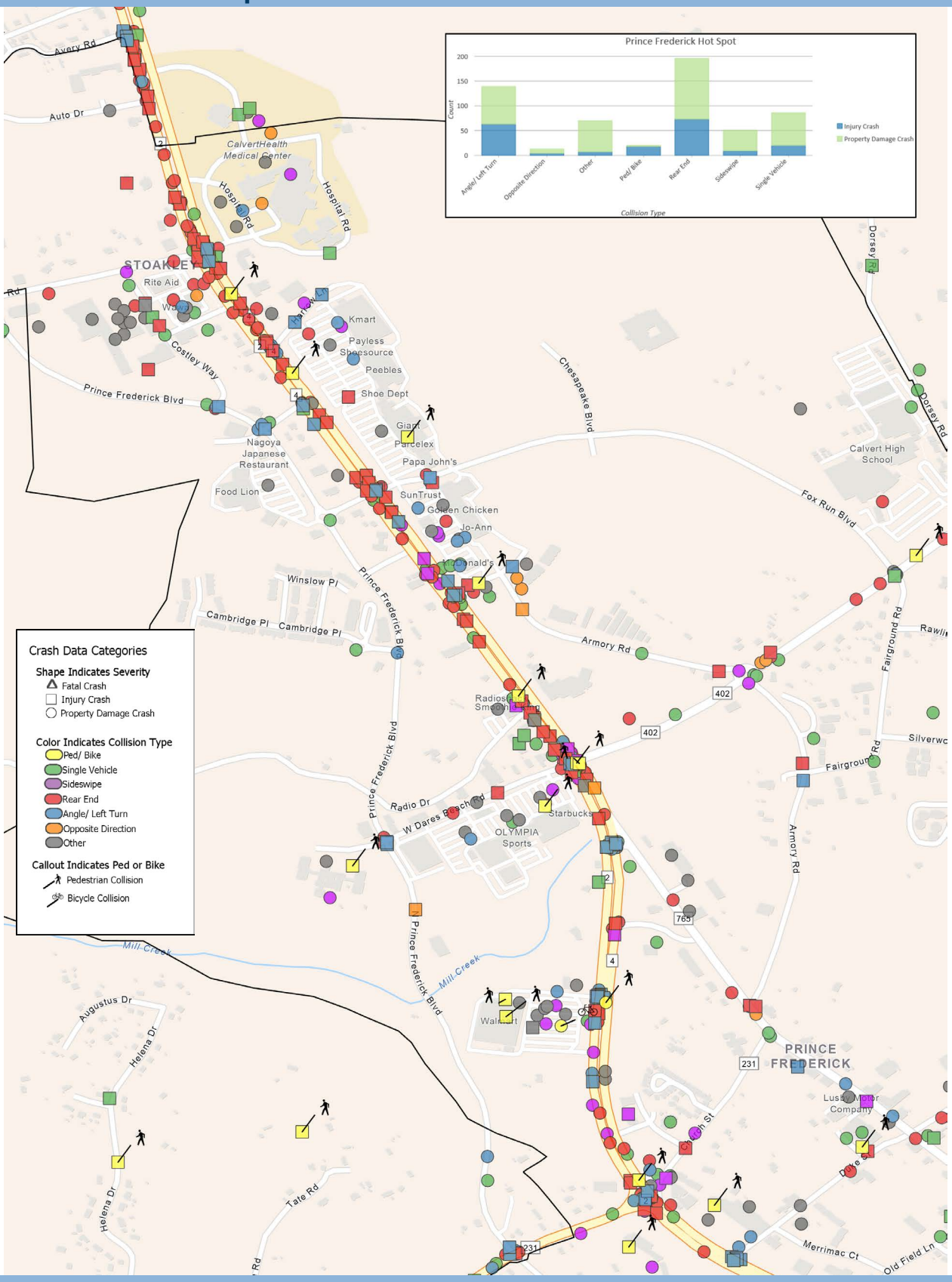
Source: Maryland Highway Safety Office

Huntingtown Hot Spot



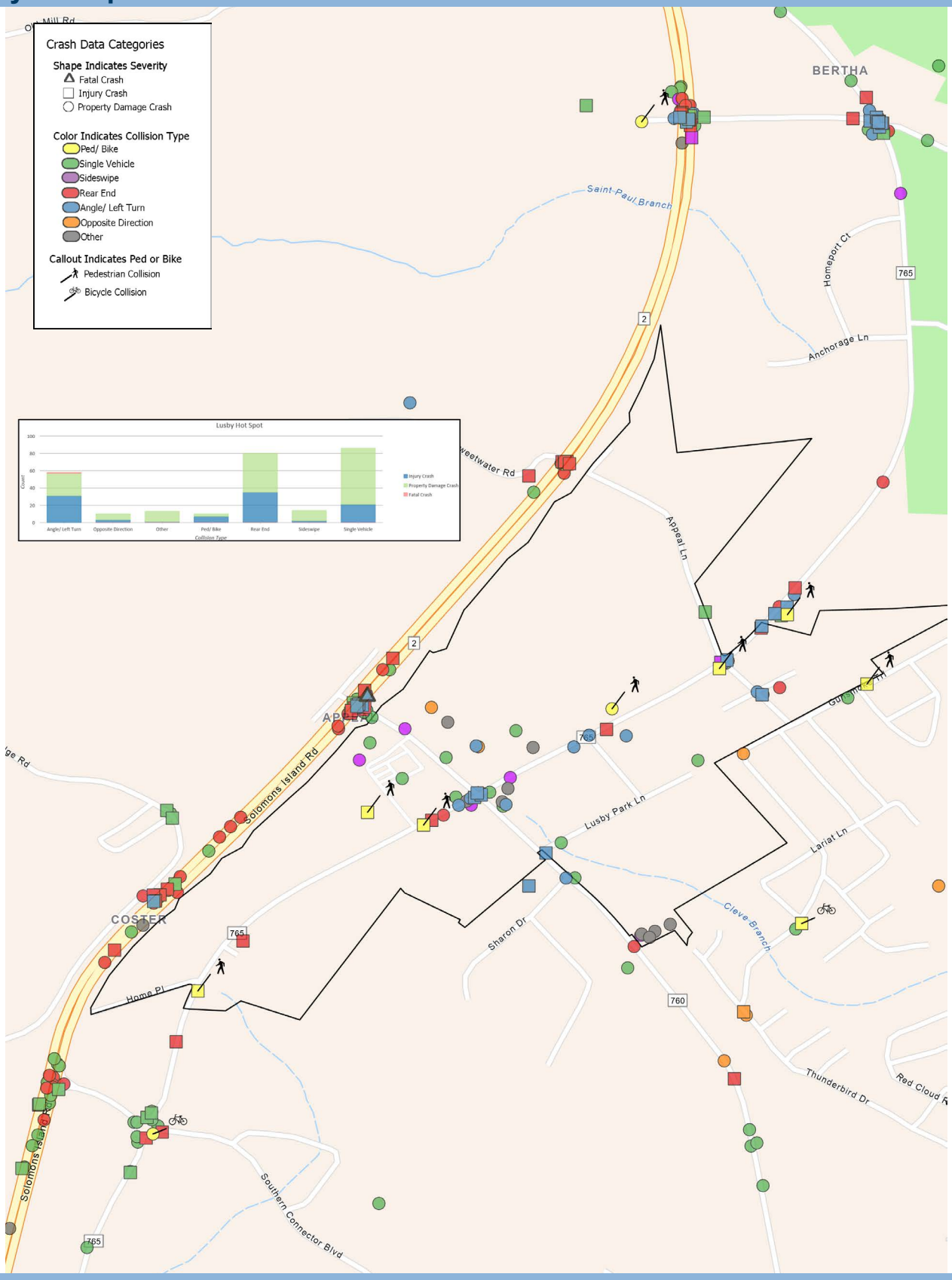
Source: Maryland Highway Safety Office

Prince Frederick Hot Spot



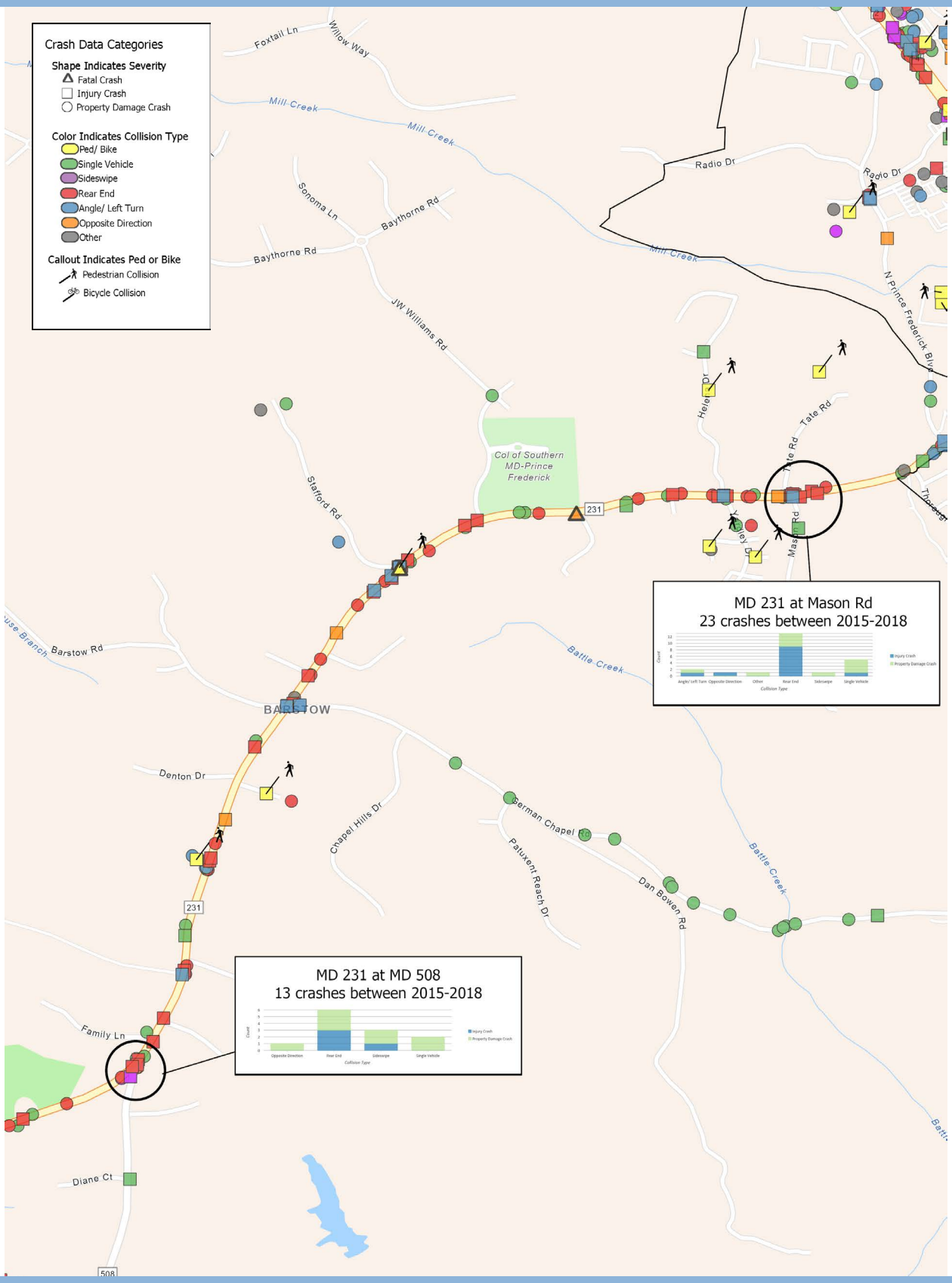
Source: Maryland Highway Safety Office

Lusby Hot Spot



Source: Maryland Highway Safety Office

SHA Crash Prevention Zones



Source: Maryland Highway Safety Office