



Vision Zero Plan

May 2022

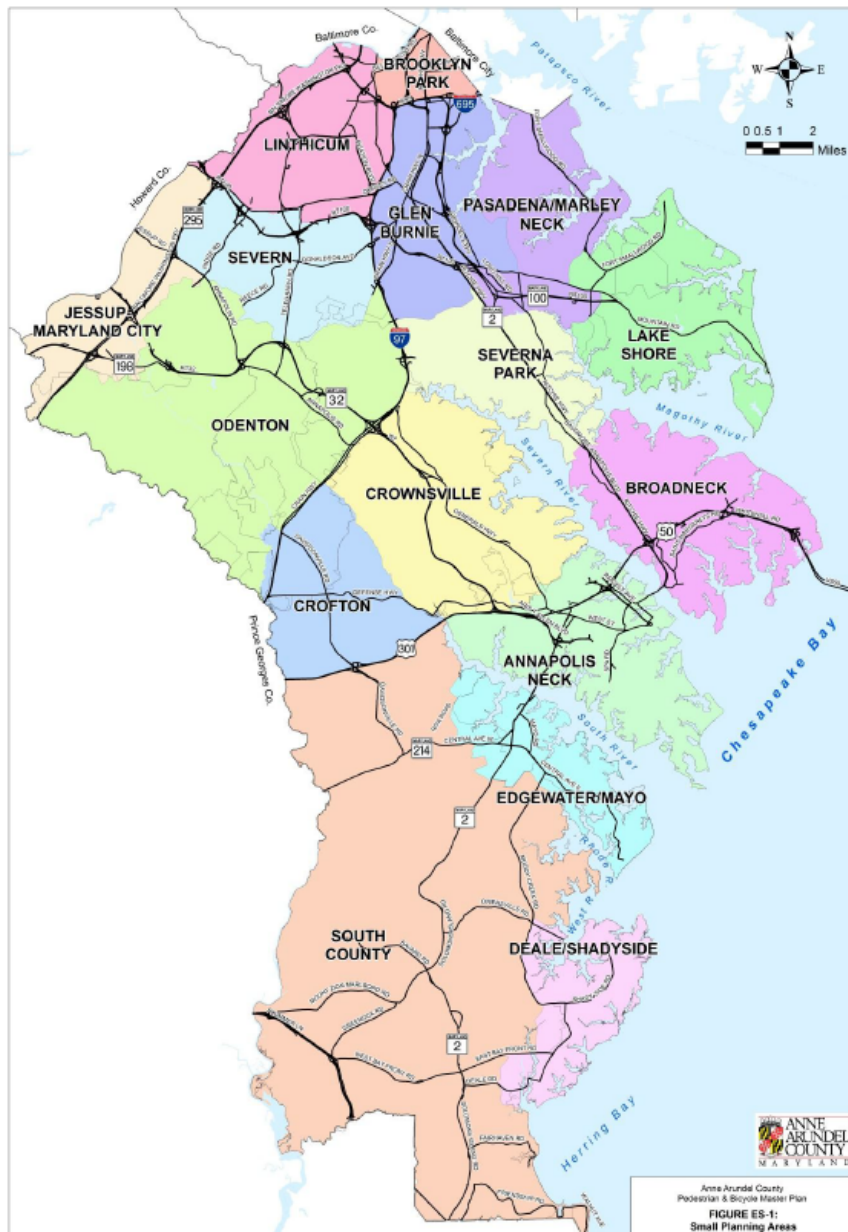


Table of Contents

<i>Message from the County Executive</i>	3
Introduction	6
Disclaimers	9
Mission and Vision	11
Traffic Trends and Data Analysis	12
Emphasis Areas	15
Emphasis Area: Infrastructure Related	16
Emphasis Area: Human Behavior	18
Emphasis Area: Vulnerable Road Users	21
Emphasis Area: Road User Types	24
Benchmarks and Targets	26
Implementation	29
Steering Committee Members	30
Acronyms	31

Message from the County Executive

The County's General Development Plan 2040 (Plan 2040) and the transportation master plan, *Move Anne Arundel!* (MAA), provide the foundations upon which this Vision Zero Plan was built.

Plan 2040, Policy BE15.1 states: *"Provide a safe transportation system, including by adopting Vision Zero principles, with a goal of eliminating preventable deaths and injuries."*

MAA's vision is: *"Anne Arundel County will provide a safe, efficient, equitable, sustainable, and multimodal transportation system that provides residents, travelers, and visitors with connectivity and choice."*

MAA established countywide goals, objectives, and performance measures aimed at creating a safe transportation system. It established that the guiding principle for providing safe transportation shall be through the adoption of the Vision Zero approach and lists those guiding principles as follows:

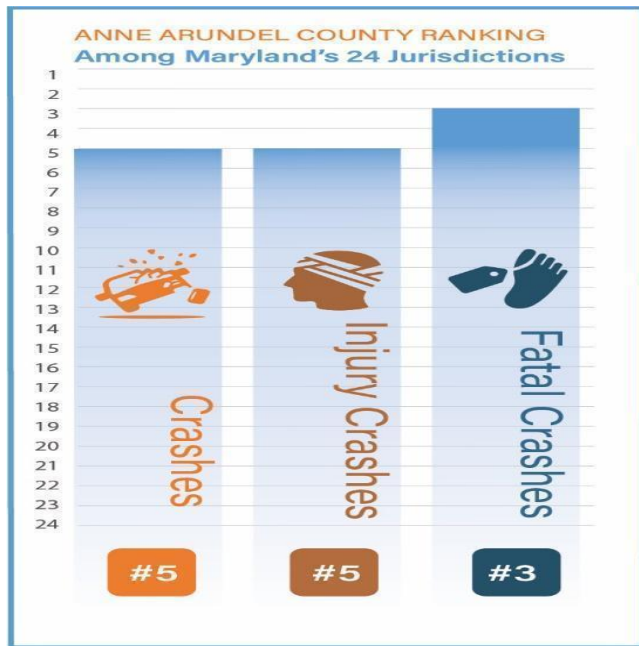
- Transportation related deaths and severe injuries are ***preventable and unacceptable***.
- ***Human life takes priority*** over mobility and other objectives of the road system.
- Human errors are inevitable and the transportation system should be designed to anticipate errors ***so the results are not severe injury or death***.
- People are inherently vulnerable and ***speed is a fundamental predictor*** of crash survival.
- 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.

This message serves as a call to action from all stakeholder agencies and employees who play a role in roadway safety, from infrastructure design to education and outreach, to participate in this effort to prevent death and serious injury resulting from crashes in Anne Arundel County and to fulfill the goals of the County's Plan 2040 and *Move Anne Arundel!* I commend those involved with developing and implementing this plan to bring the Vision of Zero deaths or serious injuries in Anne Arundel County to reality.

Safe Mobility,
Steuart Pittman, County Executive
Anne Arundel County, Maryland

Background

Each year, more than **30,000** people – roughly the population of the City of Annapolis – are **needlessly killed** on our nation’s streets and thousands more are injured. Traffic fatalities in the United States hit a seven-year high in 2015, with pedestrians and bicyclists accounting for a disproportionate share. From 2016-2020, **1,144** people **died** in traffic-related incidents and **7,609** people suffered **serious injuries** in traffic crashes in the Baltimore Metropolitan Region. In Anne Arundel County, there were **234 deaths** and **1,311 serious injuries** during that time period.



Traffic deaths and serious injuries from traffic incidents have often been seen as inevitable results of transportation systems in the United States. However, this perspective places a heavy toll on the vitality and sustainability of our community. The significant loss of life and serious injuries affects our communities in a number of ways, including personal economic costs and emotional trauma to the victims and their families, and significant burdens on taxpayers due to the emergency responses and long-term healthcare costs. The lack of safety on our streets also compromises the choice to walk or bike, which in turn weakens public health through increasing rates of sedentary diseases and higher

carbon emissions.

Leading Cause of Death

Motor vehicle traffic crashes are the leading cause of death for youth (16 to 20 years old). For each individual age, MV traffic crashes are the leading cause of death for ages from 6, 9, and 18 to 21 in 2019.

Source: Centers for Disease Control and Prevention (2019), Leading Cause of Death, WISQARS

Economic and Comprehensive Costs to Society by Type of Crash 2010 Costs (in Billions)

Crash Type	Economic Cost	Comprehensive Cost*
All	\$242	\$836
Alcohol-Impaired	\$44	\$201
Speeding	\$52	\$203

Source: <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013.pdf>

The Swedish Model

In 1997, the Swedish parliament addressed these risks by adopting a “Vision Zero” approach to transportation planning and construction, directing the government to manage the nation’s streets and roadways using policies and practices to implement the ultimate goal of preventing fatalities and serious injuries – elevating Sweden as an international leader in the area of road safety. At its most basic level, the Swedish core principle is that **no loss of life is acceptable**. It is based on the simple fact that we are human and make mistakes, and that the road system should be designed to account for them. The road system needs to keep us moving, but it must also be designed to protect us at every turn.

In 2012, President Obama signed into law the Moving Ahead for Progress in the 21st Century Act (MAP - 21). This law mandated States to adopt a Strategic Highway Safety Plan (SHSP), which Maryland has maintained for the last 15 years, the most recent update being the 2021-2025 SHSP.

In 2012, Chicago became the first city in the United States to commit to Vision Zero. Since then, many others have followed, including two in Maryland - Prince George’s County and Montgomery County, while others have adopted SHSPs - Howard, Harford, Cecil, Carroll, Washington, and Baltimore Counties.

In 2017, the Maryland Department of Transportation (MDOT) Secretary of Transportation sent out a call to action for local jurisdictions to develop their own SHSPs, tailored to their needs. In 2019, Maryland’s legislators voted to make the State the third Vision Zero State in the Country, and the State SHSP became the Vision Zero strategic plan (MD Code, Transp. §8-1001, Subtitle 10-Vision Zero).



Introduction

Not only does Vision Zero promote and facilitate a safer roadway system for all users by saving lives, Vision Zero also supports more sustainable and healthier communities through increasing the number of pedestrians and bicyclists on the road and reducing vehicular use and emissions. Providing safe, appealing, and reliable alternatives to driving can lead to healthier, more active, and sustainable communities. With the development of this plan, Anne Arundel County safety partners from different agencies and disciplines have come together to share resources and strategies. This Vision Zero Steering Committee is comprised of representatives from the following local and State agencies:

- Anne Arundel County Office of Transportation (OOT)
- Anne Arundel County Department of Public Works (DPW)
- Anne Arundel County Police Department (AAPD)
- Anne Arundel County Fire Department (AAFD)/Emergency Management Services (EMS)
- Anne Arundel County Public Schools (AACPS)
- Anne Arundel County Department of Health Department (DOH)
- City of Annapolis
- Maryland Department of Transportation State Highway Administration (MDOT SHA)
- Motor Vehicle Administration's Highway Safety Office (MHSO)
- Maryland Transportation Authority (MDTA)

Collaboration of these groups brings the best potential for success in reducing crashes, injuries, and fatalities on roadways in Anne Arundel County and improving overall safety.

The plan is structured around six “Es” of traffic safety, four of which are distinct and specific categories, and two of which are overarching that apply to all aspects of the plan.

Specific Es include:

- **Engagement** - The goals of engagement will be to provide education and outreach to citizens of Anne Arundel County. The term engagement was chosen because it means not only informing the public, but engaging them in the process when possible.
- **Enforcement** - Law enforcement plays a key role in traffic safety. Police perform enforcement such as drunk driving checkpoints, and educational campaigns such as *Click it or Ticket*. It is important to ensure that the Vision Zero strategies and implementation plan recognize that there have been historic inequities with regard to traffic enforcement and disenfranchised communities. The strategies will aim to encourage equitable use of law enforcement.
- **Engineering** - At its core, Vision Zero focuses on designing roads for the fallibility of humans. The engineering strategies will determine locations of high crash incidents and

facilitate designing the roads in a manner that prevents road users from serious injury or death.

- **Emergency Medical Services (EMS)** - Efficient EMS is critical to ensuring those affected by traffic crashes are expeditiously treated. Traffic Incident Management encompasses all that is required to avoid additional secondary accidents, which often result in injury severity greater than the initial incident. The strategies of this plan will focus on ensuring that those working in EMS have the technological resources and training they need and a safe roadway network in which to operate. EMS partners will also support educational outreach efforts.

Overarching Es include:

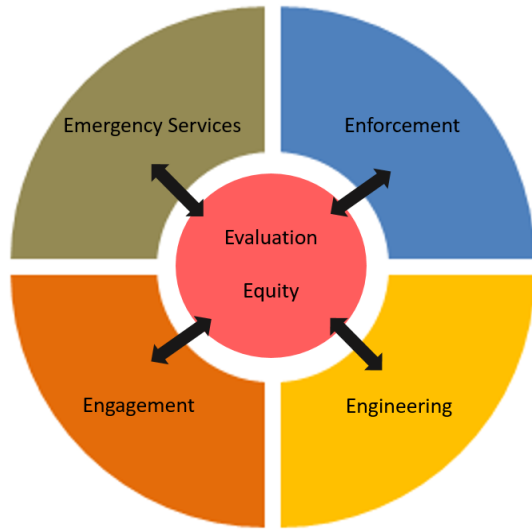
- **Equity** - Equity will be considered at all stages of planning, implementation, and review of safety initiatives or projects. It is critical to consider equity in all safety work because the Vision is to save lives and prevent serious injury to all users of the roadway network. Diversity, equity, and inclusion are focuses of all County and Statewide plans as well as a mission of the US Department of Transportation, as evidenced in discussions to develop a federal transportation bill.

Equity may take several forms based on socio demographic characteristics (e.g. race, ethnicity, income level, and geographic location), or vulnerabilities related to societal roles (physical or mental disability, language barriers, or awareness of new practices/laws). Therefore, while equity may not be specifically identified in the name of a traffic safety project under this plan, it is represented in all of the Emphasis Areas and will be incorporated into all discussions. Those equity considerations will be documented in the evaluation reports and any project descriptions submitted for inclusion.

- **Evaluation** - A key component of any strategic plan is to evaluate both the positive and negative outcomes of projects and initiatives in order to measure success and failures and plan for alternative approaches if necessary. Evaluation is an overarching concept in this plan because it is considered during the planning phases through implementation and is the final exercise to determine the plan's effectiveness. Evaluation must be considered in the first stages of project planning to identify metrics by which the project will be monitored. The different types of evaluation that will be employed include process evaluation (to understand if the implementation of a project was successful), impact evaluation (to identify any societal or cultural changes reported by the target community), and outcome evaluation (to measure the total effect on reductions in crashes, injuries, serious injuries, and fatalities). Each of those evaluation types are applicable at different stages of project implementation and allow for ongoing monitoring and adjustment based on the findings. As the action plan is developed for this Vision Zero plan, every project included will contain a performance metric and timeline to be used for evaluation.

A key component of this plan is identifying the causes for crashes and zeroing in on those types that are most prevalent, as well as their locations, in order to develop a targeted set of implementation countermeasures.

After extensive analysis of traffic safety and crash data, the Steering Committee identified the following Emphasis Areas on which to focus efforts. These categories reflect the types of crashes that caused the highest number of deaths or serious injuries over the last five years:



- **Infrastructure Related** - run off the road, intersection, and work zone collisions
- **Human Behavior** - impaired driving, speeding, and distracted driving crashes
- **Vulnerable Road Users** - pedestrian, bicyclist, and motorcycle involved crashes
- **Road User Age** - younger (ages 16-20) and older (ages 65+) drivers and pedestrians

Upon approval of this plan, the Task Force will create a specific implementation plan and shift to an implementation phase. That phase will include regular monitoring and evaluation of project outcomes and re-evaluation of safety issues over the next five years.

Disclaimers

Targets

The County’s transportation master plan, *Move Anne Arundel!* (MAA), adopted 2019, utilized a baseline year of 2017 crash fatalities to establish targets of zero deaths by 2040. While the target of zero deaths is always the ultimate goal and vision of all safety plans, transportation safety partners recognize that it is not realistic to assume it can be reached by any given year because **humans are unpredictable**. For this reason, the targets in this document represent interim metrics to achieving zero fatalities.



The same year MAA was adopted, the State became the first in the country to adopt Vision Zero through legislation. The State’s Vision Zero initiative is implemented through the Strategic Highway Safety Plan (SHSP). This change over to Vision Zero, from the previous “Toward Zero” mantra, resulted in a revised methodology in the SHSP for setting targets which now utilizes five year averages and sets incremental, realistic targets, **always moving toward zero**.

MAA set targets based on the State’s methodology at the time it was being developed and adopted, 2018 and 2019.

Baselines

Since MAA’s adoption in 2019, the Vision Zero Task Force was able to incorporate more recent and updated crash data from the Maryland Department of Transportation. Any crash reports received have been incorporated into previous years’ figures and some differences will be seen. The State releases data once all fatalities are measured and continues to accept reports in subsequent years. Therefore, the baseline numbers in this plan should supersede those in MAA.



State Roads vs. County Roads

This plan recognizes the administrative boundaries of each agency, especially with regard to enforcement and engineering countermeasures. As with every local jurisdiction, Anne Arundel County’s roadways are owned and maintained by either the State or the County. As this plan will demonstrate, most of the fatal and serious injury crashes occur on State roads. However, the County cannot directly affect changes to the infrastructure of the State roads. It is important to consider this factor as it limits the

County's ability to reach the targets set in MAA, and subsequently this plan, for all roads in the County.

For this reason, the plan will set targets for infrastructure-related crashes on County roads separately from those on State roads. However, State and local agencies will partner to affect change on all roadways in Anne Arundel County and collaborate with State SHSP teams as appropriate in the implementation plan.



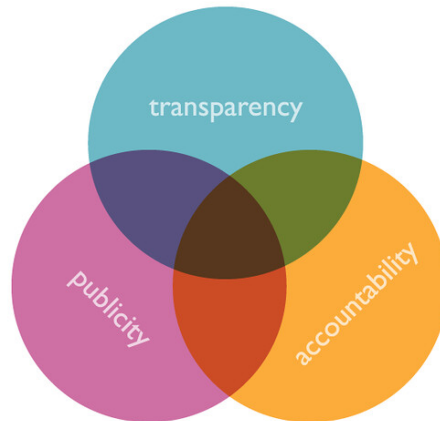
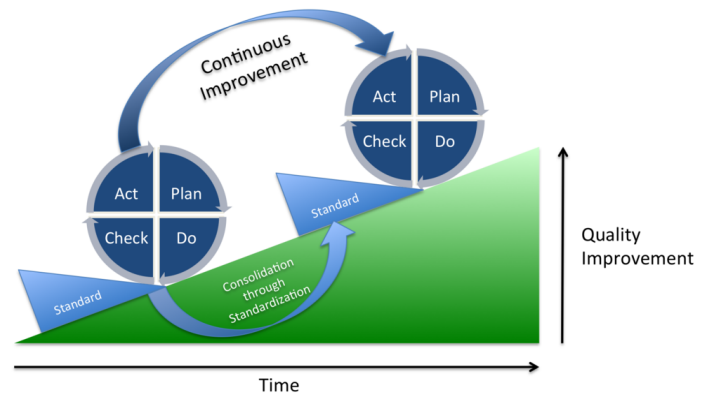
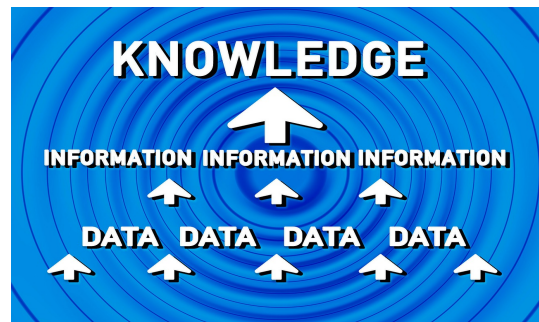
Mission and Vision

Mission – To reduce the number of traffic-related crashes, injuries, and fatalities using a comprehensive, strategic approach with six Es of traffic safety (Equity, Evaluation, Engineering, Enforcement, Engagement, Emergency Medical Services (EMS)) and promote a culture of collaboration amongst government agencies and the community to ensure traffic safety for all.

Vision – To prevent all traffic-related fatalities and serious injuries in Anne Arundel County while increasing safe, healthy, and equitable mobility for all.

Goals - The Vision Zero Steering Committee has established the following goals for this plan:

- **Be Data driven** – Identify where and why traffic collisions are happening and prioritize projects and programs in these areas
- **Continuous Effort** - Maintain a regular working group and relationship between all agencies
- **Transparency** - Maintain communication with the public regarding progress on working to enhance safety



Traffic Trends and Data Analysis

While all crashes are reported to a central repository at the Maryland State Police and quarterly data files are available on the Maryland Open Portal website, those records have not undergone post-processing for quality control. Given the time and effort involved in that quality review process, annual crash data are released approximately nine months after the year ends; thus, 2020 is the most recent data file available for this plan.

The Maryland Department of Transportation Motor Vehicle Administration’s Highway Safety Office (MHSO) regularly provides analyses of available crash data using that crash database. The Vision Zero Steering Committee utilized those summary reports, with specific data requests, to visualize the safety issues in the county. As seen in **Table 1**, over 10,000 crashes and close to 50 fatalities occur each year. With the exception of 2020, crash incidence has remained steady in the county.

Table 1.

All Anne Arundel County Crash Reports						
	2016	2017	2018	2019	2020	5 Year AVERAGE
Fatal Crashes	41	41	52	41	49	45
Injury Crashes	3,240	3,382	3,391	3,232	2,411	3,131
Total Crashes	10,366	10,496	10,698	10,638	8,555	10,151
Total of All Fatalities	44	44	55	42	49	47
Total Number Injured	4,510	4,780	4,873	4,549	3,293	4,401

Source: MHSO Benchmark Reports

In Anne Arundel County in 2020, crash incidence dropped by close to 20 percent while fatalities increased by a similar degree. In 2020, there were 49 fatalities and 3,293 injuries in 8,555 crashes in Anne Arundel County; similarly, there were 573 fatalities and 36,754 injuries in 95,507 crashes in all of Maryland. Overall, from 2016-2020 approximately nine percent of Maryland crashes, injuries, and fatalities occurred in Anne Arundel County. In 2020, **Anne Arundel County ranked #5 for the number of crashes, #5 for the number of injury crashes, and #3 for the number of fatal crashes in Maryland.** This shows that significant reductions in injuries and fatalities in Anne Arundel County will be directly reflected on the State level as well.

Anne Arundel County is a member of the Baltimore Regional Transportation Board, which serves as the Metropolitan Planning Organization for the Baltimore Region (shown below).



From 2016-2020, Anne Arundel County crashes accounted for the following percentages in the Baltimore Region:

- 19% of speeding fatalities
- 18% of pedestrian fatalities
- 21% of impaired driving fatalities

Table 2 illustrates recent crash severity trends in the County and region. Serious injuries are identified using the KABCO rating system, which conforms to the most recent guidelines including the Model Minimum Uniform Crash Criteria (MMUCC) 5th edition (See Appendix 1-2 for information on the KABCO crash rating system).

Table 2.

All Crashes in Anne Arundel County and the Baltimore Region						
Anne Arundel County						
	2016	2017	2018	2019	2020	% change 2019-2020
Fatalities	44	44	55	42	49	16.7%
Fatality Rate (per 100 MVMT)	0.72	0.71	0.89	0.67	0.93	39.0%
Serious Injuries	265	277	297	228	244	7.0%
Serious Injury Rate (per 100 MVMT)	4.34	4.47	4.80	3.65	4.65	27.5%
Non-motorist Fatalities and Serious Injuries	46	41	63	37	49	32.4%
Baltimore Region						
Fatalities	228	238	222	208	248	19.2%
Fatality Rate (per 100 MVMT)	0.83	0.86	0.80	0.75	1.06	42.4%
Serious Injuries	1,432	1,684	1,575	1,509	1,409	-6.6%
Serious Injury Rate (per 100 MVMT)	5.23	6.07	5.69	5.42	6.04	11.5%
Non-motorist Fatalities and Serious Injuries	342	356	363	342	331	-3.2%

* Non-motorist includes pedestrians and bicyclists.

Source: MHSO Benchmark Reports

To better understand countywide trends and develop countermeasures for State and local agencies, the data were separated by roadway ownership below.

Anne Arundel County, Crashes by Roadway

	State Roads					Local Roads				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Fatal Crashes	29	36	43	32	35	12	4	9	9	14
Injury Crashes	1,978	2,076	2,157	1,994	1,473	938	965	943	946	709
Total Crashes	5,780	5,843	6,267	5,968	4,664	2,916	2,909	2,869	3,000	2,528

Source: MHSO Benchmark Reports

Tables 3-6 illustrate the breakout of crash severity by roadway type using the most recent five years of crashes (2016-2020) for each Emphasis Area.

Emphasis Areas

As the number of fatalities was small, trends in the number of different levels of injury were analyzed and it was determined that the total number of injuries sustained in crashes would be used as the performance metric in this plan.

Upon reviewing available data, the following emphasis areas were established:



- **Infrastructure Related** - run off the road, intersection, and work zone collisions



- **Human Behavior** - impaired driving, speeding, and distracted driving crashes



- **Vulnerable Road Users** - pedestrian, bicyclist, and motorcycle involved crashes



- **Road User Types** - younger drivers (ages 16-20) and older drivers (ages 65+), walking children

The following sections contain the crash trends within each Emphasis Area stratified by road type. The tables are followed by a list of strategies.

Emphasis Area: Infrastructure Related

Table 3.

Infrastructure-Related Crashes	Anne Arundel County, Crashes by Roadway (2016-2020 Average)					
	State Roads			Local Roads		
	Total Crashes	Injury Crashes	Fatal Crashes	Total Crashes	Injury Crashes	Fatal Crashes
Run Off Road	1,245	307	9	643	148	3
Intersection	2,034	847	7	1,279	480	3
Work Zone	71	23	1	17	5	0

Source: MHSO Benchmark Reports

	State Roads (%)	Local Roads (%)	Odds of being injured
Run Off Road	25	23	1.09 times higher on state roads
Intersection	42	38	1.10 times higher on state roads
Work Zone	34	29	1.2 times higher on state roads

Characteristics of Infrastructure Related Crashes:

Improper turning - When drivers make unpredictable moves, there is little opportunity for others on the road to respond safely. Improper turning, or moving left or right without reasonable warning, increases the risk of collisions and can create unsafe conditions for all road users.

Failure to yield to traffic controls - Roadway users are required to obey all signs and signals on a public roadway, including stopping at stop signs and not entering intersections when a traffic signal is red. Failure to obey these traffic controls is another example of unpredictable behavior.

Unsafe Road Design – This may include the inability to properly see oncoming road users due to poor sight distance due to hills, utility poles or curves. It may include poorly designed intersections or excessive access

points to properties that create conflicts between drivers. For vulnerable road users this includes lack of dedicated facilities to separate them from vehicular traffic.



Run Off Road Crashes										
	State Roads					Local Roads				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Fatal Crashes	8	13	11	7	7	4	0	6	2	5
Injury Crashes	312	308	347	297	271	161	145	146	146	144
Total Crashes	1,203	1,228	1,435	1,150	1,207	650	662	627	665	613
Intersection Crashes										
Fatal Crashes	5	6	8	9	9	4	1	2	3	4
Injury Crashes	799	902	957	916	661	444	490	541	530	396
Total Crashes	1,938	2,044	2,254	2,224	1,708	1,182	1,277	1,387	1,406	1,142
Work Zone Crashes										
Fatal Crashes	0	2	1	0	1	0	0	0	0	0
Injury Crashes	25	18	24	26	22	12	3	4	4	4
Total Crashes	86	72	72	80	46	25	11	19	17	15

Source: MHSO Benchmark Reports

Strategies

- Expand **enforcement** around work zones.
- Implement best practices for **educational** programs related to distracted driving and navigating work zones.
- Identify high-incident locations and **engineering** countermeasures based on crash data.
- Utilize all media campaigns, including social media.
- Conduct **engagement/outreach** programs related to any construction or new designs.



Above: Intersection of Pike Ridge Road and MD 214, multiple driveways and access points in close proximity to intersection and merging.

Emphasis Area: Human Behavior

Table 4.

Human Behavior Crashes	Anne Arundel County, Crashes by Roadway (2016-2020 Average)					
	State Roads			Local Roads		
	Total Crashes	Injury Crashes	Fatal Crashes	Total Crashes	Injury Crashes	Fatal Crashes
Impaired	374	125	10	247	70	2
Speeding	788	227	5	191	61	3
Distracted	3,022	1,071	10	1,369	456	2

Source: MHSO Benchmark Reports

	State Roads (%)	Local Roads (%)	Odds of being injured
Impaired	36	29	1.2 times higher on state roads
Speeding	29	34	1.2 times higher on local roads
Distracted	36	33	1.1 times higher on state roads

Characteristics of Human Behavior Related Crashes:

Unsafe speeds - Higher vehicle speeds make avoiding a collision more difficult and can increase the severity of the collision. The faster a vehicle is traveling, the greater the stopping distance required and the greater the force of impact. The relationship between speed and injury severity is especially critical when a collision involves a pedestrian or a bicyclist.



If a pedestrian or bicyclist is struck by a vehicle traveling 40 miles per hour, there is a 90 percent chance of death or severe injury, whereas there is a 10 percent chance of death or severe injury if struck by a vehicle traveling at 20 miles per hour. Slowing down is essential to eliminating traffic deaths. (Source: AAA Foundation for Traffic Safety, Impact Speed and a Pedestrian's Risk of Severe Injury or Death, 2011)

Driving under the influence of alcohol or drugs - Driving a vehicle under the influence of alcohol or drugs—also called **impaired driving**—is a serious concern. Impaired driving may also involve the use of prescription drugs, such as opioids or other drugs that affects a driver’s focus. Drowsy driving also impairs a driver’s abilities, but is difficult to quantify.

Distracted Driving - Distracted driving **and** walking has become a leading cause of traffic crashes in Anne Arundel County and the State, with cell phones being a major contributor. The graphic below identifies the four types of distracted driving.

4 Types of Distracted Driving

			
Visual	Auditory	Manual	Cognitive
Looking at something other than the road.	Hearing or listening to something not related to driving.	Manipulating something other than the steering wheel.	Thinking about something other than driving.

Impaired Driving Crashes										
	State Roads					Local Roads				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Fatal Crashes	6	20	12	8	4	4	1	4	0	3
Injury Crashes	115	106	149	143	113	72	71	73	73	63
Total Crashes	341	368	412	407	343	245	236	262	263	229
Speeding Crashes										
Fatal Crashes	4	6	5	4	8	4	1	4	3	3
Injury Crashes	203	242	289	228	171	79	73	59	53	41
Total Crashes	688	804	972	788	687	207	195	195	198	161
Distracted Driving Crashes										
Fatal Crashes	7	8	11	11	12	3	1	1	2	2
Injury Crashes	1,111	1,191	1,181	1,077	796	461	490	479	507	345
Total Crashes	3,144	3,187	3,276	3,105	2,398	1,374	1,416	1,396	1,455	1,205

Source: MHSO Benchmark Reports

Strategies

- Expand *enforcement* of impaired driving, speeding, and distracted driving laws.
- Implement best practices for *educational* programs related to unsafe driving behavior.
- Identify high-incident locations and *engineering* countermeasures based on crash data.
- Utilize all media campaigns, including social media.
- Conduct *outreach* programs to high-risk populations.



Emphasis Area: Vulnerable Road Users

Pedestrians, bicyclists, micro-mobility users, and motorcyclists are our most vulnerable road users. It is especially important to consider equity with regard to this emphasis area because many bicyclists and pedestrians are riding or walking as their only means of transportation to get to the goods and services, or to transit, that they may need.

Table 5.

Vulnerable Road User Crashes	Anne Arundel County, Crashes by Roadway (2016-2020 Average)					
	State Roads			Local Roads		
	Total Crashes	Injury Crashes	Fatal Crashes	Total Crashes	Injury Crashes	Fatal Crashes
Pedestrians	75	60	10	75	69	1
Bicycles	26	21	1	44	36	1
Motorcycles	87	65	6	44	33	3

Source: MHSO Benchmark Reports

	State Roads (%)	Local Roads (%)	Odds of being injured
Pedestrians	93	93	equal on local and state roads
Bicycles	85	84	equal on local and state roads
Motorcycles	82	82	equal on local and state roads

Pedestrian movement - When pedestrians walk or run into the roadway unexpectedly, the likelihood of conflict with a vehicle is increased. While the driver of a vehicle shall yield the right of way to a person crossing a roadway within any marked crosswalk or at any unmarked crosswalk at an intersection, a pedestrian is required to yield the right-of-way to all vehicles on a roadway at other locations.

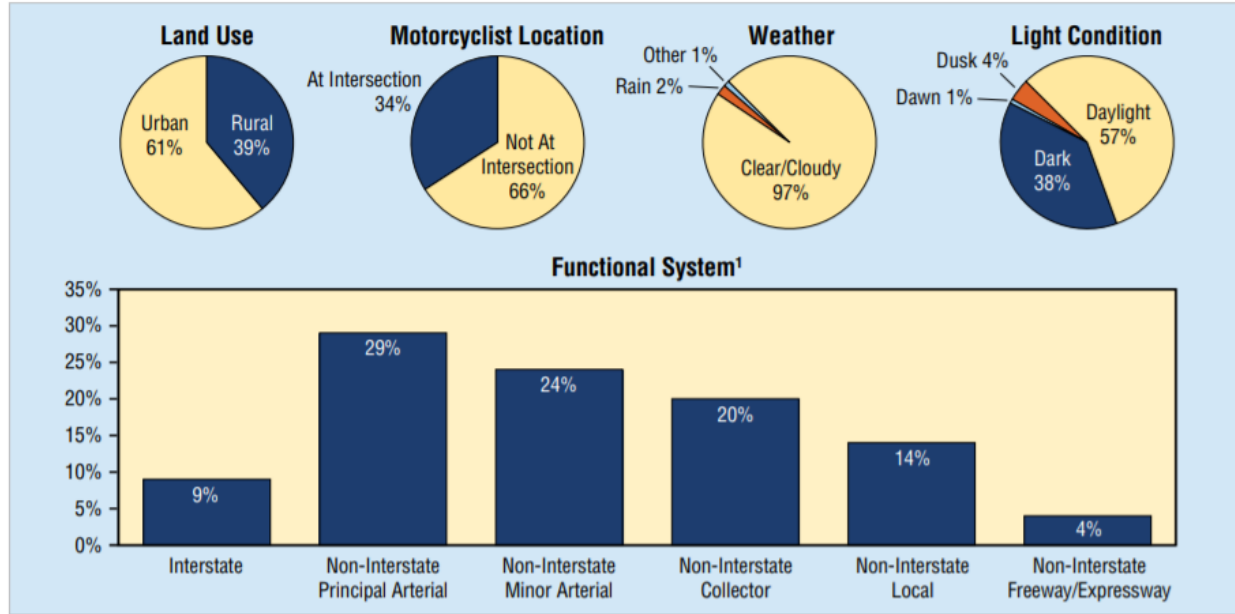


Bicyclists - Bicycles are considered vehicles by State law and are therefore permitted to share the roadway with motorized vehicles. Education of bicycling safety and laws about sharing the roadway should be targets for both cyclists and drivers of cars to foster a mutual respect for one another on the roads.



Motorcyclists - Motorcyclists, like bicyclists, are sometimes hard to see and, also like cyclists, make up a population more prone to death or serious injury. Driving a motorcycle safely as well as vehicular driver awareness should be a focus in this plan.

Motorcyclist Fatalities in Relation to Land Use, Motorcyclist Location, Weather, Light Condition, and Functional System, 2019



Source: FARS 2019 ARF
Note: Unknowns were removed before calculating percentages.

Pedestrian Crashes										
	State Roads					Local Roads				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Fatal Crashes	6	5	19	8	10	1	1	1	3	0
Injury Crashes	72	57	75	56	38	67	76	80	71	52
Total Crashes	82	68	97	72	54	71	82	88	78	58
Bicycle Crashes										
Fatal Crashes	0	1	0	1	1	1	0	0	0	3
Injury Crashes	16	25	20	31	14	25	44	35	42	34
Total Crashes	22	27	23	39	19	32	50	43	50	43
Motorcycle Crashes										
Fatal Crashes	4	5	5	6	8	5	1	3	3	3
Injury Crashes	68	70	69	58	59	30	39	35	34	25
Total Crashes	88	100	85	76	85	45	50	45	44	37

Source: MHSO Benchmark Reports

Strategies

- Expand *enforcement* of driver, pedestrian and bicycle laws.
- Implement best practices for *educational* programs related to all roadway users.
- Identify high-incident crash locations and *engineering* countermeasures based on crash data.

- Identify those areas in high demand for pedestrian and bicycling activity, especially crossings.
- Accelerate implementation of safe infrastructure that prioritizes safety for pedestrians and cyclists
- Utilize all media campaigns, including social media.
- Conduct *outreach* programs to non-motorist populations.

Emphasis Area: Road User Types

Table 6.

Road User Type Crashes	Anne Arundel County, Crashes by Roadway (2016-2020 Average)					
	State Roads			Local Roads		
	Total Crashes	Injury Crashes	Fatal Crashes	Total Crashes	Injury Crashes	Fatal Crashes
Younger Drivers	881	296	2	451	160	1
Older Drivers	812	340	7	376	151	1

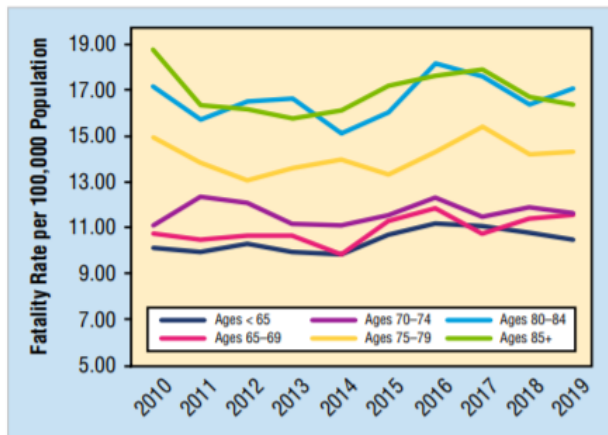
Source: MHSO Benchmark Reports

	State Roads (%)	Local Roads (%)	Odds of being injured
Younger Drivers	34	36	equal on local and state roads
Older Drivers	43	40	equal on local and state roads

Characteristics of Road User Type Related Crashes:

Younger drivers and aging drivers present unique challenges to ensuring their and others' safety on the roadways. These groups will require specific targeting strategies that should aim to overcome stigmas associated with things such as reduced reaction time in aging drivers. In youthful drivers, hormones, feelings of being invincible, and lack of experience require special attention and targeted strategies.

Fatality Rate per 100,000 Population, by Age Group, 2010-2019



Sources: FARS 2010-2018 Final File, 2019 ARF; Population – Census Bureau



Younger Driver Crashes										
	State Roads					Local Roads				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Fatal Crashes	3	3	3	0	3	1	0	1	2	2
Injury Crashes	309	372	301	288	212	175	160	155	192	117
Total Crashes	945	1,001	926	867	667	504	453	451	486	363
Older Driver Crashes										
Fatal Crashes	9	4	9	7	7	0	0	1	1	2
Injury Crashes	323	368	367	386	257	159	158	164	152	124
Total Crashes	784	811	893	915	659	374	395	384	399	329

Source: MHSO Benchmark Reports

Strategies

- Implement best practices for *educational* programs focused on younger and older drivers.
- Identify high-incident locations and *engineering* countermeasures based on crash data.
- Utilize all media campaigns, including social media.
- Conduct *outreach* programs to specific populations (e.g. high school, senior center).

Benchmarks and Targets

In setting the targets for this Vision Zero plan, it is important to be realistic and rely on the data, while continuing to aspire for zero deaths and serious injuries. Data-driven targets allow the County to better understand how its efforts impact the number of serious injuries and deaths on the road. Statistically sound targets allow for the evaluation of the effectiveness of programs and how best to invest resources toward interventions that will maximize reductions in crashes.

To identify the best methodology for setting goals and targets, several state and county plans were reviewed. As previously mentioned, *Move Anne Arundel!* includes goals of zero fatalities and injuries using a baseline data year of 2017. The Maryland SHSP sets goals using an exponential trendline with a vision of zero deaths and serious injuries, following the Code of Federal Regulations (appendix 3). Upon review of those plans and the current crash data, the Steering Committee decided to build on elements within *Move Anne Arundel!* The vision of this plan is zero deaths and serious injuries and the 2040 goals align with the *Move Anne Arundel!* methodology of 100% reduction in fatalities, 50% reduction in vehicle occupant serious injuries, and 75% reduction in bicycle and pedestrian serious injuries. The interim targets in this plan are set to achieve a 50% reduction of the goal by 2030.

Below are tables including recent data trends, interim targets, and goals:

Table 7.

	2016	2017	2018	2019	2020	2030 Target	2040 Goal
Fatalities							
Vehicle Occupant Fatalities	36	36	35	30	35	18	0
Pedestrian Fatalities	7	6	20	11	10	5	0
Bicyclist Fatalities	1	1	0	1	4	2	0
Serious Injuries							
Vehicle Occupant Serious Injuries	225	241	249	203	205	153	102
Pedestrian Serious Injuries	34	27	38	22	26	16	6
Bicyclist Serious Injuries	4	7	5	3	9	6	2

Source: MHSO Benchmark Reports

Based on performance measures outlined in 23 CFR Part 490.207(a).

That method was adapted to 100% reduction in all fatalities and 50% reduction in all injuries and serious injuries, with the exception of bicycle and pedestrian targets. As applied to each of the Emphasis Areas, the following are goals and targets (serious injury targets are included in Appendix 4):

Table 8.

Infrastructure							
Run-off-Road							
	2016	2017	2018	2019	2020	2030 Target	2040 Goal
Fatalities	12	14	19	9	12	6	0
Injuries	627	625	644	591	554	416	277
Intersections							
Fatalities	9	9	10	12	13	6	0
Injuries	1,928	2,161	2,327	2,196	1,561	1,170	780
Work Zone							
Fatalities	0	2	1	0	1	0	0
Injuries	55	28	39	41	39	30	20

Human Behavior							
Distracted							
	2016	2017	2018	2019	2020	2030 Target	2040 Goal
Fatalities	10	9	14	13	14	7	0
Injuries	2,431	2,641	2,658	2,489	1,736	1,302	868
Impaired							
Fatalities	11	23	17	8	7	4	0
Injuries	296	325	340	350	268	201	134
Speeding							
Fatalities	9	8	9	8	11	6	0
Injuries	419	528	524	421	307	231	154

Vulnerable Road Users							
Pedestrians							
	2016	2017	2018	2019	2020	2030 Target	2040 Goal
Fatalities	7	6	20	11	10	5	0
Injuries	244	229	271	219	179	112	45
Bicycles							
Fatalities	1	1	0	1	4	2	0
Injuries	48	81	64	84	59	37	15

Motorcycles							
Fatalities	10	6	9	9	11	6	0
Injuries	130	131	129	117	102	77	51

Road User Age							
Younger Drivers (ages 16-20)							
	2016	2017	2018	2019	2020	2030 Target	2040 Goal
Fatalities	4	3	4	2	5	3	0
Injuries	758	865	726	757	507	381	254
Older Drivers (ages 65+)							
Fatalities	9	5	10	8	9	4	0
Injuries	758	823	903	817	574	430	287

Source: MHSO Benchmark Reports

Implementation

A plan is only as good as it is implemented. The real work will be implementing the recommendations and strategies and maintaining attention to achieve the ultimate goal of zero deaths or serious injuries. While this program may take a number of years of effort, safety will remain the key priority. Success will require not only government officials and agencies support but also the continued engagement with the public. Success will not be possible without sustained effort and grass roots commitment from all stakeholders.

This task force will continue meeting regularly to update our collective progress and share its information with anyone who has interest. We will meet quarterly to review the status of programs and discuss pertinent issues regarding implementation.

The action plan, or implementation plan, will be reviewed and evaluated annually. The plan will have a life cycle of five years, at which time a comprehensive evaluation will be conducted and a revision developed and implemented.



Steering Committee Members

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Philip Whitelock, Office of Emergency Management

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Ariane Warren, Maryland Transportation Authority (MDTA)

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Anne Arundel County would like to thank Cindy Burch, BMC, Douglas Mowbray, MHSO, and
Glen Sine, Washington College for their support in creating this document.

Acronyms

AAPD	Anne Arundel County Police Department
AAFD	Anne Arundel County Fire Department
AACPS	Anne Arundel County Public Schools
BMC	Baltimore Metropolitan Council
BRTB	Baltimore Regional Transportation Board
DOH	Anne Arundel County Department of Health
DPW	Anne Arundel County Department of Public Works
EMS	Emergency Medical Services
MAA	Move Anne Arundel!
MDOT	Maryland Department of Transportation
MDOT SHA	Maryland Department of Transportation State Highway Administration
MDTA	Maryland Transportation Authority
MHSO	Maryland Department of Transportation Motor Vehicle Administration's Highway Safety Office
OOT	Anne Arundel County Office of Transportation
SHSP	Strategic Highway Safety Plan
VMT	Vehicle Miles Traveled