Montgomery
County Council

Committee: Directly to Council
Committee Review: N/A
Staff: Glenn Orlin, Senior Analyst
Purpose: Receive briefing and have discussion – no vote expected
Keywords: #VisionZero

AGENDA ITEM #7
January 28, 2020
Discussion

SUBJECT

Vision Zero Program - Update

EXPECTED ATTENDEES

Presenters include:

Tim Smith, Acting State Highway Administrator

Wade Holland, Acting Vision Zero Coordinator for the County Government

Casey Anderson, Chair, Montgomery County Planning Board; and

Kristy Daphnis, Chair, Pedestrian, Bicycle, and Traffic Safety Advisory Committee

COUNCIL DECISION POINTS & COMMITTEE RECOMMENDATION

Not applicable

DESCRIPTION/ISSUE

The Council has scheduled this update in response to the recent spate of pedestrian fatalities. The Council will receive briefings from the State Highway Administration, County Government, the Park & Planning Commission, and the Pedestrian, Bicycle & Traffic Safety Advisory Committee.

SUMMARY OF KEY DISCUSSION POINTS

To be determined.

This report contains:

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AGENDA ITEM #7
January 28, 2020

MEMORANDUM

January 23, 2020

TO: County Council

FROM: Glenn Orlin, Senior Analyst GO

SUBJECT: Vision Zero Program

PURPOSE: Update

Vision Zero (VZ) is a wide-ranging program of engineering, education, and enforcement initiatives to significantly reduce and even eliminate fatal and severe injury accidents to pedestrians, bicyclists, and motor vehicle users by 2030.[1] This is the third Council update on the VZ program in the last year, the prior two on March 26, 2019 and November 19, 2019. During this update the Council will hear updates from:

Tim Smith, Acting State Highway Administrator, concentrating on what VZ efforts have been undertaken by SHA in Montgomery County since the briefing two months ago, as well as what actions are being taken to specifically address the two fatalities on Georgia Avenue within the last couple of weeks;

Wade Holland, Acting VZ Coordinator for the County Government, describing its 2020 VZ Work Program (he will have a PowerPoint presentation), and reporting what VZ efforts have been undertaken by County DOT, Police, etc. since the November briefing, and the status for hiring a permanent VZ Coordinator;

Casey Anderson, Chair, Montgomery County Planning Board, describing the Planning staff's planned VZ Work Program (see ©1-26); and

Kristy Daphnis, Chair, Pedestrian, Bicycle, and Traffic Safety Advisory Committee, commenting on the Committee's recent activities.

[1] Key search term: #VisionZero

The cumulative time for these updates should take about a half-hour, leaving about an hour for Q&A among Councilmembers and staff. Others anticipated to be on hand as resources for the Q&A session are:

Adriana Hochberg, Assistant Chief Administrative Officer
Chris Conklin, Director, County Department of Transportation (DOT)
Captain Tom Didone, Acting Chief, Field Services Division, Department of Police (MCPD)
Captain David McBain, Acting Traffic Division Director, MCPD
Andre Futrell, District 3 Engineer, SHA
Erica Rigby, P.E., Deputy District 3 Engineer, SHA
Derek Gunn, P.E., Assistant District 3 Engineer – Traffic, SHA
Samantha Biddle, Director, Organizational Excellence, SHA
Leon Langley, Assistant Director of Transportation, Montgomery County Public Schools (MCPS) – may be joined later by Todd Watkins, Director of Transportation, MCPS

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MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

MCPB
Item No. 2
Date: 01/23/2020

Vision Zero Update and Work Program Discussion

DA David Anspacher, Transportation Supervisor, david.anspacher@montgomeryplanning.org, 301-495-2191
KW Karen Warnick, Management Services Chief, karen.warnick@montgomeryplanning.org, 301-495-4517
JS Jason Sartori, Functional Planning and Policy Chief, jason.sartori@montgomeryplanning.org, 301-495-2172

Completed: 01/16/2020

SUMMARY

Receive briefing and add the Predictive Safety Analysis project to the department's work program for the current fiscal year (FY20).

DESCRIPTION

The purpose of this discussion is to:

1) Provide an update on the Planning Department's Vision Zero work plan.
2) Provide an overview of the Department's Vision Zero accomplishments in 2019.
3) Request approval from the Planning Board to add a Predictive Safety Analysis project to the department's work program for the current fiscal year.

BACKGROUND

Vision Zero is a proven approach to preventing roadway-related deaths and severe injuries. It represents a fundamental change in how we plan and design our roads, shifting from a focus on maximizing motor vehicle efficiency to ensuring that our roads are safe regardless of whether travel is by car, bus, bicycle or foot. Vision Zero recognizes that people will sometimes make mistakes and that our roads should be designed to ensure those inevitable mistakes do not result in severe injuries or fatalities.

Through its 2016 County Council resolution, Montgomery County committed to eliminating traffic fatalities and severe injuries. In 2017, the County Executive released an initial two-year action plan of activities to advance the County toward Vision Zero and substantial progress has been made toward most of these items (see Attachment A). The two items that are in the Planning Department's work program – ENG-2 (Road Design Standards, aka the Complete Streets Design Guide / Roadway Classification Study) and LPA-6 (Pedestrian Master Plan) – are both well underway. A One-Year 2020 Action Plan will be released by the County imminently to bridge activities between the current Two-Year Action Plan and the Ten-Year Action Plan. The County will be developing a Ten-Year Action Plan over the next year.

PLANNING DEPARTMENT'S VISION ZERO WORK PLAN

Vision Zero is a multidisciplinary effort that requires the support of all County agencies to be successful. The Montgomery County Planning Department has an important role to play in Vision Zero and can

support Montgomery County's program with community engagement, data analysis, master planning, development review and capital project review, among other things. The Planning Department has prepared a Vision Zero Work Plan describing the tasks that the department can undertake to support the County's Vision Zero program. This work plan includes a description of each task, the justification for the task, the required resources and the anticipated timeline to completion.

Staff will brief the Planning Board on the Planning Department's Vision Zero Work Plan on January 16. A copy of the work plan is included as Attachment B. (See ©4-19)

RECAP OF THE PLANNING DEPARTMENT'S VISION ZERO ACCOMPLISHMENTS IN 2019

The Planning Department had several Vision Zero accomplishments in 2019. These include hiring the department's first Vision Zero Coordinator, completing the Veirs Mill Corridor Master Plan, MARC Rail Communities Master Plan and Aspen Hill Vision Zero Study, co-leading the development of the Complete Street Design Guide / Roadway Functional Classification Project and the Fire Department Access Performance-Based Design Guide with the Department of Transportation and the Department of Permitting Services, initiating the Pedestrian Master Plan, preparing a Pedestrian Level of Comfort Map and reviewing a number of important regulatory projects.

A summary of the Planning Department's Vision Zero accomplishments in 2019 is included as Attachment C.

PREDICTIVE SAFETY ANALYSIS

One of the changes that many Vision Zero communities undertake is to transition from a safety approach that focuses on locations where high rates of severe injuries or fatalities have already occurred to one that also proactively identifies and treats locations with similar risk characteristics. This approach – what we are calling a Predictive Safety Analysis – seeks to prevent serious injury or fatal crashes from happening throughout the roadway network, including at locations without a recent history of crashes, but where a high risk of future crashes may be suspected based on the roadway characteristics and surrounding context.

Planning Department staff requests approval from the Planning Board to add a Predictive Safety Analysis project to the Department's work program for the current fiscal year (FY20). It is anticipated that this project will take 12 months.

The Planning Department is well-positioned to complete this effort as we have the necessary staffing to manage the project and we have extensive data management and analysis expertise. Staff believes this project is necessary to initiate this fiscal year, as the analysis it provides is critical to guiding the projects and policy changes that will be identified in the County's ten-year action plan, which the County intends to complete by the end of calendar year 2020. The project, which is described in greater detail in Attachment D, will be completed in partnership with the Montgomery County Department of Transportation (MCDOT) and CountyStat, with their staff participating heavily in the development of the project. The Planning Department has recently hired Jesse Cohn as its first Vision Zero Coordinator and one of her primary tasks would be to manage this project. Staff estimates the cost of this project to be approximately $250,000, based on similar work that was completed by the City of Seattle, Washington.

(See © 20-26)

Staff recommends that we use a combination of existing funds to complete this project.

The Functional Planning and Policy Division has identified $75,000 in its current FY20 operating budget that can be used toward this project, including 1) $25,000 for Transportation Modeling for the Pedestrian Master Plan and 2) $50,000 for Data for Vision Zero.

An additional $125,000 has been identified through early estimates of FY20 personnel savings, which the Planning Department is requesting to reallocate for the Predictive Safety Analysis project.

The Department believes that the remaining $50,000 can be identified in additional personnel savings or other budget savings over the remaining six months in FY20.

Another option to fund this project would be to seek a supplemental appropriation for any remaining funding shortfall from the County Council.

Staff has considered asking MCDOT to contribute funding to this project. However, when we have tried this option in the past, we have found the process to be complicated and very time-consuming to transfer funding between departments, relative to the timeline for this project. MCDOT already has committed to be a critical partner in the Predictive Safety Analysis, and that department's capital budget will be a key source of funding to implement recommendations from the study.

MCDOT has provided a letter supporting the addition of the project to the Planning Department's work program, which is included as Attachment E.

SUMMARY OF STAFF RECOMMENDATIONS

Staff recommends:

- Adding the Predictive Safety Analysis to the Planning Department's current work program, with a completion date of January 2021.
- Funding the Predictive Safety Analysis in part by transferring $125,000 to the project from personnel savings in the Planning Department's FY20 operating budget.

ATTACHMENTS

Attachment A – Progress in Implementing the Vision Zero Two-Year Action Plan

Attachment B – Planning Department Vision Zero Work Plan

Attachment C – Overview of Planning Department's Vision Zero Accomplishments in 2019

Attachment D – Predictive Safety Analysis Work Plan

Attachment E – Letter from the Montgomery County Department of Transportation

VISION ZERO BACKGROUND

Montgomery County is one of the first counties and suburban communities to commit to Vision Zero. The County's neighborhoods and subdivision patterns are largely auto-centric, characterized by long blocks, wide travel lanes and low-densities. Coupled with a transportation system built to prioritize motor vehicle travel, these land use patterns encourage motorists to drive at high speeds and create a highly disconnected walking and bicycling network.

These suburban features present greater challenges to achieving the objectives of Vision Zero than the grid of walkable streets that define the development pattern of many North American cities that have adopted Vision Zero. Montgomery County's land use patterns and the design of its transportation network were intentional and represent the fulfillment of a vision to segregate land uses and connect distant activity centers by high-speed automobile travel. Achieving Vision Zero will require re-envisioning its existing development patterns and transportation network.

Vision Zero is a multidisciplinary effort that requires the support of all County agencies to be successful. The Montgomery County Planning Department has an important role to play in Vision Zero and can support Montgomery County's program with community engagement, data analysis, master-planning, development review and capital project review, among other things.

WORK PLAN OVERVIEW

To support the successful implementation of Montgomery County's Vision Zero policy, the Montgomery County Planning Department should focus on the following elements:

- Educate residents, community organizations and elected officials.
- Develop collaborative partnerships with local, regional and state agencies, as well as the community, to advance Vision Zero.
- Base recommendations for the Planning Department's work products on robust data analysis that informs changes to County policies and priorities.
- Utilize the master plan process to re-envision our communities, especially our suburban transit corridors and commercial areas, as multimodal complete streets with appropriate land use densities.
- Review and approve regulatory projects with a Vision Zero focus.
- Review capital projects and identify budget priorities that best support Vision Zero.

This work plan includes a list of actions the Planning Department can initiate to support Montgomery County's Vision Zero program, identifies the resources that are needed to complete these tasks and assigns a timeline to each task. The work plan is divided into four sections:

- Building Knowledge and Collaborative Partnerships
- Problem Verification
- Develop Solutions
- Incorporate Solutions into Work Program

BUILDING KNOWLEDGE AND COLLABORATIVE PARTNERSHIPS

The Planning Department engages with the community, appointed and elected officials, and governmental agencies through master plans, regulatory applications, review of capital projects and review of budget priorities. This comprehensive participation provides an opportunity for the Planning Department to educate stakeholders and develop collaborative partnerships to advance Vision Zero. The following list of actions identifies strategies to educate participants, establish a shared understanding of Vision Zero and provide opportunities for collaboration amongst individuals and groups to advance Vision Zero in their communities and throughout Montgomery County.

Develop a Vision Zero Toolkit for Community Organizations	
Lead: Vision Zero Coordinator	**Support**: Communications Team, Transportation Planners
Action: Collaborate with Montgomery County to develop a toolkit for community organizations and community members to build a systematic understanding of Vision Zero and provide resources for advocating on behalf of Vision Zero through participation in master plan development, regulatory review and capital project review / budgeting. Toolkit can be translated into multiple languages and may include: • Educational letters and flyers. • Presentation talking points. • Video that explains Vision Zero in an approachable way. • Yard signs to build awareness of Vision Zero (with messaging such as "20 is Plenty"). • Residential testimonials. • Walk audit checklists.	
Justification: To ensure that community leaders have the resources they need to develop a Vision Zero constituency and to educate other community members about Vision Zero.	
Resources: Communications support	
Timeline: Short Term	

Engaging Hard-to-Reach Communities	
Lead: Vision Zero Coordinator	**Support**: Communications Team
Action: Collaborate with Montgomery County to convene hard-to-reach groups to advance understanding of Vision Zero in their communities. • Identify opportunities to reach community members in the County's Equity Emphasis Areas and vulnerable populations, such as students. • Identify and engage leaders in traditionally hard-to-reach communities.	
Justification: To ensure that all communities are aware of and have the opportunity to participate in Vision Zero.	
Resources: Communications support	
Timeline: Ongoing	

Educate Community Members, Agency Staff and Appointed/Elected Officials	
Lead: Vision Zero Coordinator	**Support**: Communications Team, Transportation Planners
Action: Collaborate with Montgomery County to educate community organizations, community members, county agencies and appointed and elected officials about Vision Zero and opportunities for engagement. • Organize and implement a Vision Zero summit for established organizations with a stated interest in Vision Zero. • Organize and implement a Citizen's Academy, or program designed to provide community members with a working knowledge of the roles of governmental agencies in Vision Zero and a central resource for community members. • Organize demonstration projects, through placemaking events or tactical urbanism, to exhibit solutions, improvements or strategies consistent with Vision Zero. • Educate county and state employees indirectly through master plans, capital project review and regulatory review. • Educate appointed and elected officials through briefings, master plan development, capital project review and regulatory approvals. • Develop partnerships with other stakeholders, such as the public health community. • Share data and analysis developed through the Problem Verification section of this work plan as well as the best practices identified in the Develop Solutions section to inform educational efforts. • Request Civic Associations and Homeowners Associations to designate a Vision Zero liaison.	
Justification: Build a better understanding of Vision Zero.	
Resources: Communications support	
Timeline: Ongoing	

Vision Zero Electronic Newsletter	
Lead: Vision Zero Coordinator	**Support**: Communications Team
Action: Develop and maintain a Vision Zero electronic newsletter to: • Share information related to new and ongoing plans and projects with a Vision Zero focus. • Provide updates on transportation and planning projects that improve roadway safety. • Share opportunities for interaction and participation to advance Vision Zero strategies. • Offer resources for community members to learn about available or newly developed resources to advance Vision Zero.	
Justification: To inform community organizations and community members of progress toward Vision Zero in Montgomery County and opportunities for involvement.	
Resources: Communications support	
Timeline: Ongoing	

PROBLEM VERIFICATION

A critical first step to successfully implement Vision Zero is to verify the causes of severe injuries and fatalities on the County's transportation network. The Planning Department maintains extensive datasets and is capable of complex data analysis. These resources can be used to systematically identify roadway characteristics that create safety challenges. Data analysis will help Montgomery Planning to prioritize master plan and regulatory recommendations and to provide comments on the capital budget and capital projects and will help community members in advocating for safer streets.

A preliminary analysis of crashes in Montgomery County indicates that roadway safety is a reflection of land use and the County's high-speed, high-volume roads, which often lack safe facilities for pedestrians, bicyclists and transit users. Countywide, between 2015 and 2019 about 30 percent of severe injury crashes and 50 percent of fatalities involve pedestrians and bicyclists. In rural areas motor vehicle occupants represent over 95 percent of these crashes. In the county's major employment and activity centers (Silver Spring, Bethesda, White Flint, Wheaton, Rockville Town Center and Friendship Heights) pedestrians and bicyclists represent approximately 65 percent of these crashes. Proven strategies in cities that have adopted Vision Zero may be appropriate in our major employment and activity centers, but alternative and innovative approaches are needed in the County's rural and suburban areas.

Develop a Severe and Fatal Crash Dataset	
Lead: Vision Zero Coordinator	**Support**: Functional Planning & Policy Division
Action: Create and maintain a dataset to conduct crash analysis based on land use and street characteristics. • Develop systematic procedures for cleaning CountyStat crash data. • Add variables to enrich analysis, including land use context, roadway functional classification, number of travel lanes (total and through), roadway vehicle volumes, posted speed limit and distance between safe crossings. • Incorporate racial, income and health data into the database. • Work with Montgomery County Police Department to clean crash data. • Identify when and where infrastructure conditions have changed during the period of crash data collection.	
Justification: This dataset will enable staff to conduct reactive safety analyses to identify the types of land use and street characteristics that contribute to severe and fatal crashes. It will serve as a building block for a predictive safety analysis.	
Resources: CountyStat crash data and existing GIS resources.	
Timeline: Ongoing	

Develop a Multimodal Volumes Data Collection Plan	
Lead: Vision Zero Coordinator	**Support**: Functional Planning & Policy Division
Action: Develop a data collection plan to identify locations where pedestrian, bicycle and motor vehicle volume data is needed to develop a model that estimates volumes where they do not currently exist.	
Justification: A data collection plan is needed to identify locations where pedestrian, bicycle and motor vehicle volume data is underrepresented in the department's intersection database.	
Resources: Consultant support, existing pedestrian, bicycle and motor vehicle volume data	
Timeline: Short Term	

Collect Multimodal Counts and Traffic Speed Data	
Lead: Vision Zero Coordinator	**Support**: Functional Planning & Policy Division
Action: Collect auto, bicycle and pedestrian volume data at locations identified in the Multimodal Volumes Data Collection Plan.	
Justification: This data will be used to develop a model to estimate pedestrian, bicycle and motor vehicle volumes on every road segment in the County.	
Resources: New pedestrian, bicycle and motor vehicle volume data.	
Timeline: Short Term	

Estimate Pedestrian, Bicycle and Motor Vehicles Volumes Countywide	
Lead: Vision Zero Coordinator	**Support**: Functional Planning & Policy Division
Action: Develop a model to estimate pedestrian, bicycle and motor vehicle volumes where they do not currently exist and to convert these volumes into annual volumes.	
Justification: Measures of exposure such as pedestrian, bicycle and motor vehicle volumes are normalization factors (i.e., the denominator) that equalize for differences in the quantity of potential crash events in different road environments and therefore help to quantify risk.	
Resources: Consultant support, existing pedestrian, bicycle and motor vehicle volume data.	
Timeline: Short Term	

Create a Database to Store Multimodal Counts and Traffic Speed Data	
Lead: Functional Planning and Policy Division	**Support**: Information Technology & Innovation
Action: Modify the existing intersection count application (mcatlas.org/intersections) to include counts at unsignalized and mid-block locations and to include speed data.	
Justification: Successful Vision Zero programs make safety-related data available to the public.	
Resources: Existing GIS resources.	
Timeline: Medium Term	

GIS Layers of Variables that are Hypothesized to be Correlated with Severe and Fatal Crashes	
Lead: Vision Zero Coordinator	**Support**: Functional Planning and Policy Division
Action: Using the Severe and Fatal Crash Dataset, create street segment and crossing GIS layer that identifies variables that are locally hypothesized to be correlated with severe and fatal crashes.	
Justification: This dataset will allow the County to identify variables that are correlated with severe and fatal crashes in Montgomery County.	
Resources: Severe and Fatal Crash Dataset	
Timeline: Short Term	

Develop Safety Performance Factors	
Lead: Vision Zero Coordinator	**Support**: Functional Planning and Policy Division
Action: Develop Safety Performance Factors (SPF) for common crash types involving severe and fatal injuries. SPFs are equations used to predict the average number of crashes per year at a location as a function of exposure and roadway characteristics.	
Justification: Data analysis will help Montgomery Planning prioritize master plan and regulatory recommendations and to provide comments on the capital budget and capital projects.	
Resources: Severe and Fatal Crash Dataset, Estimate of Pedestrian, Bicycle and Motor Vehicles Volumes Countywide and the GIS Layers of Variables Hypothesized to be Correlated with Severe and Fatal Crashes.	
Timeline: Short Term	

Create a Pedestrian Level of Comfort Map	
Lead: Functional Planning and Policy Division	**Support**: N/A
Action: Develop a pedestrian level of comfort methodology and code the pedestrian network countywide.	
Justification: Similar to the Bicycle Level of Stress map, this effort will enable sophisticated analysis of connectivity within geographic areas and to public facilities that will support master plan recommendations and help to prioritize pedestrian improvements.	
Resources: University of Maryland Center for Smart Growth Contract	
Timeline: Short Term	

Develop Procedures for Data Collection and Analysis	
Lead: Vision Zero Coordinator	**Support**: Transportation Planners

Action: Develop procedures for Vision Zero data collection and analysis for master plans and regulatory review, including:
• Data Collection
  ○ Location and time periods of motor vehicle, pedestrian and bicycle counts, including signalized and unsignalized locations and high-volume mid-block crossing locations.
  ○ Location and time periods of speed studies.
• Develop a Vision Zero-standard approach to data analysis
  ○ Crash analysis
  ○ Conflict analysis
  ○ Connectivity analyses	

Justification: Effective data collection and analysis is needed to understand where safety problems are most severe and to help prioritize Vision Zero recommendations. Through Vision Zero, safety can be achieved by reducing travel speeds and conflicts.	
Resources: Consultant Support	
Timeline: Short Term	

DEVELOP SOLUTIONS

Once the safety challenges have been systematically identified through data collection and analysis, staff will identify engineering solutions and policy changes that address the challenges present in Montgomery County's diverse land uses – challenges resulting from the segregation of land uses and prioritization of high-speed vehicular travel over several decades. These solutions will be used to incorporate Vision Zero into the department's work program, including master plan recommendations, regulatory approvals/changes and review of capital projects.

Identify Best Practices in Implementing Vision Zero in the Suburbs	
Lead: Vision Zero Coordinator	**Support**: Transportation Planners, Community Planners and Urban Designers
Action: This investigation will look at best practices in suburban counties that have adopted Vision Zero (Macon, Georgia; Alameda, California; and Contra Costa, California) and cities that have suburban areas (New York; Alexandria, Virginia) and will include: • Best practices to manage suburban arterial speeds. • Best practices to reduce suburban arterial conflicts. • Identify context-sensitive design characteristics to reduce vehicular speeds.	
Justification: To understand how other jurisdictions approach transportation safety on suburban roads.	
Resources: Consultant Support	
Timeline: Medium Term	

Develop Policies for Street Types and Land Use Context	
Lead: Vision Zero Coordinator	**Support**: Transportation Planners
Action: Develop policies for different combinations of street typologies and land use context to address the safety challenges identified in the Problem Verification section. Policies will include these areas: • Access management • Frequency of safe crossings in urban areas, transit corridors, suburban areas and rural areas • Locations where unsignalized trails crossings are acceptable	
Justification: Bring Montgomery County's policies in line with strategies to reduce severe and fatal crashes.	
Resources: Consultant Support	
Timeline: Medium Term	

Develop Complete Streets Design Guide / Roadway Functional Classification Study	
Lead: M-NCPPC and MCDOT	**Support**: DPS
Action: This project has two main elements: • A Complete Streets Design Guide to design and operate roads to provide safe, accessible and healthy streets for all users of our roadway system in support of the County's Vision Zero policy, and • A replacement for Montgomery County's roadway functional classification system that organizes categorizes streets based on how they are used by people and their land use context, rather than the current approach that largely organizes street based on how vehicles use them.	
Justification: Montgomery County's road design standards are out of date.	
Resources: Consultant Support	
Timeline: Ongoing	

INCORPORATE SOLUTIONS INTO WORK PROGRAM

Using the results of the Develop Solutions section of this work plan, staff will work to incorporate solutions to the identified safety challenges into the Planning Department's work program through master plan recommendations, regulatory approvals/changes and review of capital projects.

Educate Staff on Vision Zero	
Lead: Vision Zero Coordinator	**Support**: Transportation Planners

Action: Educate staff about Vision Zero:
• Vision Zero briefing to all staff.
  ○ Provide clear and consistent messaging for staff on the importance of Vision Zero, roles and responsibilities.
• Master Planners:
  ○ Meet with teams of recently initiated master plans to provide guidance on incorporating Vision Zero into their planning effort.
  ○ Convene a meeting with all master plan teams to discuss how to incorporate Vision Zero into master plans.
  ○ Incorporate Vision Zero into the General Plan.
• Regulatory Planners:
  ○ Meet with regulatory supervisors to identify opportunities and challenges to incorporating Vision Zero into regulatory review.
  ○ Convene a meeting with all regulatory reviewers to discuss how to incorporate Vision Zero into development review, our authority in code to request Vision Zero improvements, and how to overcome challenges with incorporating Vision Zero into development review.	

Justification: Master plan and regulatory staff must understand the principles of Vision Zero to build a culture of safety in the Planning Department.	
Resources: Existing Staffing	
Timeline: Short Term	

Continuing Education	
Lead: Vision Zero Coordinator	**Support**: Transportation Planners, Communications Staff
Action: Continue education on Vision Zero through conferences, webinars, etc. for staff to remain current on the latest data and solutions as well as the challenges and opportunities associated with the integration of Vision Zero into master plans, regulatory review and capital projects.	
Justification: Continuing education allows for an evolution of Vision Zero in our work.	
Resources: Conference and webinar fees	
Timeline: Ongoing	

Incorporate Corridor Master Plans into Department Work Program	
Lead: Area Teams	**Support**: Functional Planning and Policy Division

Action: Based on the analysis conducted in the Problem Verification section, recommend additional master plans to the Planning Department's work program:
 	
• Potential Corridors
  o High Injury Network: Randolph Road, Georgia Avenue and University Boulevard.
  o Bus Rapid Transit Facility Planning Studies: New Hampshire Ave (FY22 – 24), Old Georgetown Road (FY 24 – 25)
• Develop procedures with MCDOT on an approach to conducting corridor master plans.	

Justification: Master-planning provides an effective means of re-envisioning development patterns and the transportation network as multimodal, mixed-use communities.	
Resources: Existing Staffing	
Timeline: Long Term	

Changes to State and Local Policies, Regulations and Laws	
Lead: Vision Zero Coordinator	**Support**: Transportation Planners
Action: Collaborate with MCDOT to identify changes to state and local regulations that support Vision Zero, including: local authority to reduce speed limits, strengthen access management regulations for development approvals and provide policies that reduce lane widths, target speeds and curb radii outside of urban road code areas.	
Justification: This is an action in Montgomery County's Two-Year Action Plan.	
Resources: Existing Staffing	
Timeline: Medium Term	

Develop a Pedestrian Master Plan	
Lead: Functional Planning and Policy Division	**Support**: Transportation Planners
Action: Complete a Pedestrian Master Plan for the County to address the unique issues faced by pedestrians and people with disabilities.	
Justification: This is an action in Montgomery County's Two-Year Vision Zero Action Plan.	
Resources: Consultant Support	
Timeline: Ongoing	

Incorporate Vision Zero into Master Plans	
Lead: Vision Zero Coordinator	**Support**: Transportation Planners, Community Planners, Design and Communication Staff

Action: Based on the analysis conducted in the Problem Verification section, incorporate Vision Zero into master plans areas through these items:
 	
• Collect pedestrian, bicycle and motor vehicle volume data at signalized and unsignalized crossings and mid-block crossings and speed data for specific master plans.
• Create a more refined evaluation of the master plan area:
  ○ Roadway characteristics conducted in the problem verification section to identify safety issues.
  ○ High-priority areas such as schools, libraries, major transit stations and other public facilities for the ability to walk and bicycle comfortably.
• Develop a master-planning toolkit to address common transportation safety issues.	

Justification: Master-planning provides an effective means of re-envisioning development patterns and the transportation system to create a safe transportation network.	
Resources: Consultant Support	
Timeline: Medium Term	

Incorporate Vision Zero into Development Review	
Lead: Vision Zero Coorindator	**Support**: Transportation Planners, Community Planners and Design Staff
Action: Incorporate Vision Zero into development review through these items: • Educate the development community on Vision Zero principles. • Develop toolkit for regulatory reviewers to reduce speeds and conflicts by creating a sense of enclosure, consolidating access points, creating a finer-grained network of streets and concentrating greater levels of activity, which can result in more frequent, safe crossings and create more activity. • Establish a Vision Zero finding for regulatory projects.	
Justification: Development projects have the ability to improve safety by reducing conflict points and reducing street design speeds.	
Resources: Existing Staffing	
Timeline: Short Term	

Incorporate Vision Zero into the Subdivision Staging Policy	
Lead: Functional Planning and Policy Division	**Support**: Transportation Planners
Action: Update the Subdivision Staging Policy to reflect an effective transportation safety element: • Incorporate safety evaluation and data collection in traffic studies, including travel speed data. • Incorporate safety into transportation system performance measures and technical analysis.	
Justification: The Subdivision Staging Policy currently analyzes motor vehicle mobility but does not evaluate transportation-system safety.	
Resources: Consultant Support	
Timeline: Ongoing	

Capital Project Review	
Lead: Functional Planning and Policy Division	**Support**: Transportation Planners
Action: Incorporate Vision Zero into recommendations on the capital budget and capital projects: • Identify and prioritize transportation safety projects for inclusion in the capital budget based on crash severity, equity, etc. • Incorporate a Vision Zero review for mandatory referrals and facility planning studies.	
Justification: Designing transportation infrastructure to be safe is the primary way to achieve Vision Zero.	
Resources: Existing Staffing	
Timeline: Ongoing	

RESOURCE SUMMARY

This section of the work plan includes an initial summary of the resources that will be needed to accomplish the actions in the work plan, identifies those items that are existing (FY20), proposed (FY21) and potential future (FY22 and beyond) work program items and the level of effort to implement each action (* = relatively easy, *** = relatively difficult).

Action	Section	Resources	Timeline	Applicable Projects and Initiatives	Level of Effort
Develop a Vision Zero Toolkit for Community Organizations	Building Knowledge	Communications Support	Short Term	No	**
Engaging Hard-to-Reach Communities	Building Knowledge	Communications Support	Ongoing	No	***
Educate Community Members, Agency Staff and Appointed/Elected Officials	Building Knowledge	Communications Support	Ongoing	No	***
Vision Zero Electronic Newsletter	Building Knowledge	Communications Support	Ongoing	No	*
Develop a Severe and Fatal Crash Dataset	Problem Verification	CountyStat crash data and existing GIS resources.	Ongoing	No	**
Develop a Multimodal Volumes Data Collection Plan	Problem Verification	Consultant support, existing pedestrian, bicycle and motor vehicle volume data	Short Term	Transportation Modeling for the Pedestrian Master Plan (FY 20)	**
Collect Multimodal Counts and Traffic Speed Data	Problem Verification	New multimodal counts and traffic speed data	Short Term	Data for Vision Zero (FY 20)	*
Estimate Pedestrian, Bicycle and Motor Vehicles Volumes Countywide	Problem Verification	Consultant Support, Existing Pedestrian and Bicycle Counts	Short Term	Request Year End Funds (FY 20)	***
GIS Layers of Variables that are Hypothesized to be Correlated with Severe and Fatal Crashes	Problem Verification	Severe and Fatal Crash Dataset	Short Term	Request Year End Funds (FY 20)	***

Attachment B: Planning Department Vision Zero Work Plan

Action	Section	Resources	Timeline	Applicable Projects and Initiatives	Level of Effort
Develop Safety Performance Factors	Problem Verification	Severe and Fatal Crash Dataset, Measure of Exposure for Walking and Bicycling, Transportation Network Dataset	Short Term	Request Year End Funds (FY 20)	***
Create a Pedestrian Level of Comfort Map	Problem Verification	Consultant to refine Pedestrian Level of Comfort methodology	Short Term	Pedestrian Connectivity Mapping (FY 20)	***
Develop Procedures for Data Collection and Analysis	Problem Verification	Consultant Support	Short Term	No	*
Develop Complete Streets Design Guide / Roadway Functional Classification Study	Develop Solutions	Consultant Support	Ongoing	Roadway Functional Classification System (FY 19)	***
Educate Staff on Vision Zero	Incorporate Solutions into Work Program	Existing Staffing	Short Term	No	**
Continuing Education	Incorporate Solutions into Work Program	Conference and webinar fees	Ongoing	No	*
Capital Project Review	Incorporate Solutions into Work Program	Existing Staffing	Ongoing	No	*
Incorporate Vision Zero into Development Review	Incorporate Solutions into Work Program	Existing Staffing	Short Term	No	*
Incorporate Vision Zero into the Subdivision Staging Policy	Incorporate Solutions into Work Program	Consultant Support	Ongoing	Policy Area and Local Area Transportation Update (FY 20)	***
Develop a Pedestrian Master Plan	Incorporate Solutions into Work Program	Consultant Support	Ongoing	Pedestrian Master Plan (FY 20)	***
Create a Database to Store Multimodal Counts and Traffic Speed Data	Problem Verification	Existing GIS resources	Medium Term	No	**

Attachment B: Planning Department Vision Zero Work Plan

Action	Section	Resources	Timeline	Applicable Projects and Initiatives	Level of Effort
Identify Best Practices in Implementing Vision Zero in the Suburbs	Develop Solutions	Consultant Support	Medium Term	No	**
Develop Policies for Street Types and Land Use Context	Develop Solutions	Consultant Support	Medium Term	No	**
Changes to State and Local Policies, Regulations and Laws	Incorporate Solutions into Work Program	Existing Staffing	Medium Term	No	***
Incorporate Vision Zero into Master Plans	Incorporate Solutions into Work Program	Consultant Support	Medium Term	No	*
Incorporate Corridor Master Plans into Department Work Program	Incorporate Solutions into Work Program	Existing Staffing	Long Term	No	*

TOOLE DESIGN

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MEMORANDUM

October 18, 2019

To: David Anspacher
Organization: M-NCPPC, Montgomery County Planning
From: Frank Proulx PhD, Thomas Hillman AICP, Alia Anderson AICP
Project: Montgomery County Safety Performance Function Estimation Methodology

Re: Safety Performance Function Methodology

INTRODUCTION

To advance implementation of its Vision Zero program, Montgomery County is transitioning from a descriptive crash analysis framework to one that integrates predictive analytical methods. With this shift, in addition to focusing safety improvement efforts on locations where high rates of injuries or fatalities have already occurred, the County will also proactively identify and treat locations with similar risk characeristics. This approach seeks to prevent serious injury or fatal crashes from happening throughout the roadway network, including at locations without a recent history of crashes, but where a high risk of future crashes may be suspected based on the characteristics of those locations. This type of analysis can also be used to quantify the expected reduction in crashes from treatments that may be applied to improve safety at these locations.

This document provides specific guidance for Montgomery County staff to implement this approach by estimating and deploying predictive safety performance functions (SPFs). SPFs can be used to predict crash rates for roadway segments or intersections with similar characteristics. SPFs are used to estimate the baseline conditions at a given crash site, to which Crash Modification Factors (CMFs) may be applied to estimate the crash reduction from a given treatment. By modeling and applying SPFs, Montgomery County can understand both sides of the safety coin: where treatments are needed, and the potential effectiveness of treatments that could be applied, as long as a CMF is available.

The SPF analytical method is comprised of the following steps:

1. Data Consolidation and Assembly
2. Exposure Estimation
3. SPF Estimation
4. Application

A detailed methodology of each step of the workflow is provided in the following sections. Required skills for SPF estimation and application in this context include: data management, geoprocessing techniques, generalized linear models, basic machine learning, and knowledge of multi-modal (i.e. including bicycle and pedestrian) safety concepts. During and after each step, examine the data or outputs (as necessary) using maps, graphs, or other descriptive statistics. This will serve as an important check to make sure the results make intuitive sense, and that there are no unresolved underlying data issues.

The methodology and commentary contained herein is based on the project team's understanding of available data at the time of preparation, and requires implementation by professionals trained in inferential transportation safety statistical modeling methods. It is intended to yield a relative prediction of locations where safety

treatments may be beneficial, but is not intended to provide a precise determination of conditions at any location. Further data collection, engineering analysis, and design are necessary prior to implementing safety treatments. Motor vehicle crashes are complex occurrences that often result from multiple contributing factors. Reuse and/or alteration of this instrument of service is at the user's sole risk.

1. DATA CONSOLIDATION AND ASSEMBLY

There are two applicable units of analysis to estimate SPFs: roadway segments and intersections. The following steps are necessary to collect and consolidate the data for SPF estimation. Note that while the predictive safety will be applied to all modes of travel, Step 1 focuses on bicycle and pedestrian data because those data are less available.

Section 1. Consolidate Crash- or Volume-Associated Predictors in GIS

Join all variables applicable to each unit of analysis into a single GIS layer for each (i.e. one layer for intersections, and one layer for segments). Any variable that is available and hypothesized to be locally correlated with pedestrian or bicyclist volumes and crash patterns should be included.

1. Create Segment GIS Layer
    a. Common examples for segment data include:
        - Population density (e.g., the overall population density within a ¼ mile buffer of the segment)
        - Employment density
        - Commercial property
        - University locations (e.g., whether the segment is within 1/10 mile of a university)
        - Federal campuses
        - Transit stations / bus stops
        - AADT
        - Bike lanes
        - Sidewalks
        - Number of lanes
        - Speed limit
        - Roadway width
        - Horizontal and vertical alignment (e.g. sharp hills or tight winding roads)
        - Presence, width, and type of median
        - Frequency of Protected Crossings (*see steps 2 and 3*)
        - Intersection characteristics (*see steps 2 and 3*)
    b. Possible additional examples noted by Montgomery County:
        - Functional class
        - Urban road code area
        - Access control
        - Maintenance responsibility
2. Create Intersection GIS Layer
    a. Join relevant segment data from 1.a above to intersection geometries.
    b. Common examples of intersection data include (note that some of these, such as number of lanes, can be summarized in various ways):
        i. Number of lanes (e.g., total through-lanes, total through-lanes on highest functional classification approach)
        ii. Turning bays
        iii. Turning restrictions
        iv. Signalization
        v. Signs
        vi. Crosswalks (e.g. marked crosswalks present on highest functional classification approach, total number of marked crosswalks)
        vii. Number of legs on intersection (3, 4, or 5+)

viii. Highest speed limit
ix. T or Y intersection (for 3 leg intersections)
x. Presence, width, and type of median
xi. Other pedestrian safety improvements (RRFB, HAWK)

c. Calculate intersection skew in GIS (Optional)
i. This step computes the angles between all lines that intersect at an intersection (azimuth).
ii. It is not essential to estimate an SPF, but may improve the accuracy of estimates.

3. For both segments and intersections, calculate additional statistics that may help predict crash outcomes:
a. E.g. Population density within 1/10, 1/4, 1/2 mile
b. Proximity to "Town Centers"
c. Proximity to train stations (i.e. Metrorail, MARC/Amtrak, and light rail) and bus rapid transit stations.

Section 2. CAVEAT: Install Dates - Possible Approaches

Roadway networks are frequently updated as lane configurations, speed limits, or other characteristics change. Meanwhile, since crashes are statistically rare events, multiple years of data are required in a safety analysis to ensure crash trends reflect real safety issues, rather than unrelated variation alone. To identify the estimated crash rate of a given location typology, it is important to ensure that the underlying data used to define those locations and estimate their SPFs is consistent and reliable. In particular, it is necessary to identify when and where infrastructure conditions have changed during the period of crash data collection, or to otherwise account for this change. Possible approaches to address this issue include:

1. If data are available for infrastructure modifications by year (e.g. segments and intersections), the record can be split into multiple records representing "before" and "after" periods around the change, based on an "effective date".
a. If this method is used, consider eliminating data from the year containing the "effective date" of the change or any construction preceding it, if known. This helps control for safety effects of construction, which is beyond the scope of this methodology.
b. A simplified variation of this is to separately tabulate the crash data and infrastructure condition data for each year, resulting in a dataset with distinct observations for every road unit for each year in the study period. This approach may be vulnerable to "short study window" issues (i.e., too many records with no crashes). It may be worthwhile to eliminate the data from study years in which changes were implemented or construction took place, if known.
c. All variations of this approach require volume and infrastructure data to be reasonably accurate for each year
2. Stamp each intersection with when it last changed (and only use crashes at that location after that point). This is essentially using only the "after" period from method 1 above and dropping the before period.
3. Drop those locations that have substantially changed within the study period. This method may be appropriate where changes have occurred recently but the exact dates are unknown, or if a location has experienced multiple changes over the study period.
4. Pick a short enough study window to ensure homogenous conditions.
a. If the study window is too short, there may not be enough crash data to estimate an accurate model, and even in short study windows, some infrastructure conditions may have changed. The standard study window to balance these concerns is 3-5 years.

Section 3. Clean Crash Data

1. Ensure crashes are geocoded to accurate locations on the roadway network.

   a. Add X and Y information to any crashes where this is not reported based on other location-based fields in the crash dataset (e.g. route, cross-street, distance from intersection, etc.).
      i. Exercise caution when geocoding based on addresses; some crashes with an address only and no route/cross-street information may have occurred in parking lots or otherwise off the roadway network, and these crashes should not be geolocated to the roadway, as this would artificially inflate the safety concern on that portion of the roadway (these are often property damage only crashes in parking lots).
   b. Check existing X and Y coordinates in the dataset for accuracy. Compare tabular location information to the coordinates provided. Adjust or discard crash records as appropriate.
2. Code crashes by subsets to be subsequently modeled, for example:
   a. Crash Types (Crash types specific to motor vehicles are commonly reported by police and stored in crash databases; crash types relevant to bicyclists and pedestrians should also be modeled)
   b. Crash Year
   c. Mode (bicyclist, pedestrian, motorcycle, or motor vehicle; model scooter crashes separately if data is available to distinguish these from pedestrians)
      i. Caution: A single crash may involve parties using more than one mode, yet is usually coded with a single mode. Often the most vulnerable mode is coded, for example:
         1. If a pedestrian is involved, code as a pedestrian crash
         2. If a bicyclist is involved, code as a bicyclist crash
         3. If a motorcycle is involved, code as a motorcycle crash
         4. If none of these are involved, then code as a motor vehicle
      ii. An alternative coding approach is to default to the mode with the worst injury. In most cases this will result in a similar categorization.
3. Join crashes to relevant network attributes (i.e. intersection or segment, as appropriate).
   a. Some crashes have an intersection Boolean field, which could be used for attribution of intersection and non-intersectino crashes.
   b. In the asbsence of this Boolean field, or for data cleaning and valiation of the field, intersection crashes can be calculated using geospatial information using one of two common methods:
      i. Create a defined buffer around an intersection and all crashes within that buffer are intersection crashes (e.g. 50 or 100 feet, or)
      ii. Create a dynamic buffer that is different for each intersection depending on how many lanes each intersection approach is. More lanes means a wider intersection means the buffer should be bigger.
4. Aggregate to units of analysis (e.g., count of crashes based on the variables to be modeled)
   a. Basic approach: Total # of pedestrian, bicycle, motorcycle, motor vehicle crashes per unit of analysis (i.e., intersection or segment).
   b. Advanced approach: Total # of crashes per year, per unit of analysis, by mode and crash type to be modeled.

Section 4. Annualize Existing Pedestrian and Bicycle Volume Estimates (Count Data)

If motor vehicle or motorcycle annualized volumes are not available (i.e., only raw counts are available for these modes), the same procedure can be applied to motor vehicle count data to annualize volume estimates.

1. Summarize observed pedestrian crossings at the intersection level and bicycle volumes at the segment level, as well as the observation period when that data was collected.
   a. E.g. Two hour turning movement counts at each intersection with available count data.
2. Annualize the short-duration volume data to an "average annual daily traffic" format to account for variation in what the observed short-duration count implies about total activity levels due to factors such as time of day, land use, weather, and season. This can be approached as follows:
   a. If local permanent counters are available, evaluate the patterns to identify any distinct hour-of-day patterns.
      i. Group counters with similar hour-of-day peaking patterns for pedestrian and bicycle volumes
      ii. Calculate hour-of-day extrapolation factors

iii. Assign short-duration count locations to the identified groups based on similar land uses contexts and apply factors to short-duration counts to produce a daily volume for the day the count was collected

b. Otherwise, select factors from counters from other locales or from the National Bicycle and Pedestrian Documentation Project

c. Use a day of year calculation (ratio of that date's total volume to the AADT at that location) to extrapolate the short-duration counts, based on the geographically closest permanent count site. This technique adjusts for seasonality and weather effects, which have been shown to dramatically impact bicycle and pedestrian counts.[1]

3. The resulting Annual Average Daily Bicycle Traffic (AADBT) and Annual Average Daily Pedestrian Traffic (AADPT) values will be used to develop exposure models in the following step.

2. EXPOSURE ESTIMATION

Estimate Annual Pedestrian, Bicycle and Motor Vehicle Volumes at Missing Locations

Develop a predictive model to estimate bicycle, pedestrian, motorcycle and motor vehicle volumes at locations where they do not currently exist. Pedestrian volumes are best modeled at the intersection level. Bicycle, motorcycle and motor vehicle volumes are best modeled at the segment level and used to infer intersection volumes.

1. Estimate a Poisson or Negative Binomiall model
    a. Find the best model to predict the annualized counts based on other variables that could predict volumes such as population density, land use, transportation network characteristics, proximity to transit, ACS bicycle and pedestrian commute estimates, or volume estimates from a travel demand model, if available, to predict intersection pedestrian volumes and segment bicycle and motor vehicle volumes.
        i. Choose which variables to use as inputs for the model using some type of standard approach or technique, based on what skills and resources are available. This might be following the example of previous models or studies completed by the County, following examples from existing literature or reports, or applying some type of statistical or machine learning analysis technique, such as bivariate correlation, decision tree models, random forest models, stepwise model building, etc.
        ii. Assess model fit. Cross validation is one common method to assess model fit in this context, which can be accomplished using various free software packages.[2]
        iii. Generally, avoid including variables that are highly correlated with one another. For example, population density and adjacency to high capacity transit could be highly correlated. This is not a hard and fast rule, but if there are too many variables that are highly correlated, the model will be inefficient and the predictions will be less accurate.
2. For motor vehicle volumes, if values are not available from a regional travel demand model, they can either be calculated as above or by using spatial interpolation.
3. Once models have been estimated for pedestrian, bicycle, motorcycle and motor vehicle volumes, they must be applied to the full dataset to predict volumes at each intersection and road segment. Any models that were estimated at the segment level should also be aggregated to the intersections that they spatially intersect with; keep in mind that the sum of all segment volumes should be divided by 2 to account for the incoming and outgoing flow (each vehicle that enters also exits, and is thus observed on two segments).

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[1] NCHRP Report 797 Appendix D contains additional additional details on the day-of-year factoring approach.

[2] For example, see documentation on SciKit Learn for more information on cross-validation: https://scikit-learn.org/stable/modules/cross_validation.html

3. SPF ESTIMATION

SPF Estimation follows a very similar workflow to Step 2, with the following notes:[3]

1. Estimate a model for each identified crash type (see Section 1, "Clean Crash Data", item 2a). Minimally, this might include the following:
    a. Intersection bicyclist, pedestrian, and motor vehicle crashes.
    b. Segment bicyclist and motor vehicle crashes. Pedestrian segment crashes typically are not modeled as it is difficult to parse out whether these crashes are people on the sidewalk, people accessing cars parked on the block (i.e., walking in the street), or people crossing midblock. In each of these cases, exposure would likely need to be estimated separately, which would require more detail than is available in standard count data.
2. Whereas in Step 2 the outcome/dependent variable was traffic volumes, here it is the number of crashes. The critical difference in the modeling approach is that now we must account for "exposure" variables, which are typically transformed using a natural logarithm. Some modeling packages do this implicitly if you indicate that a variable is an exposure variable, and others you must supply the log-transformed variables as a separate input. For intersection models, the relevant traffic volumes are the standard exposure value; for segment models, the length of the segment is also typically taken into account.
3. Test for multicollinearity (i.e., using a variance inflation factor test) and choose the best model accordingly.
4. If conditions have changed substantially during the observation period, it may not be appropriate to include a given observation directly (i.e., as described previously in Step 1, Section 2). Control for observations where conditions may have changed. For example, with bike lanes, you may have a certain infrastructure condition in the first 4 years of the study period and a separated bicycle lane installed for the final year. There are two common options for dealing with this problem:
    a. Do not include observations in the model that have changed substantially over the study period
    b. Split each segment/intersection into multiple observations for the 'before" and "after" period from when they were modified. This approach is more robust, but requires more complicated data management. If this approach is taken, the numer of crashes will need to be separately tabulated for the two time periods, and the number of each years in each will need to be recorded and included in the model as an "offset" variable; i.e., a log-transformed variable whose parameter has been fixed to have a value of 1.
        i. If reliable infrastructure from the "before" period is unavailable, it's acceptable to discard the "before" period and only look at the after case.
        ii. If either the before period or the after period is extremely short (say, 1 year), exclude it.

[3] See FHWA guidance on this topic for more information: https://safety.fhwa.dot.gov/rsdp/downloads/spf_development_guide_final.pdf.

4. APPLICATION

1. Apply the SPF to the full dataset to produce the model-estimated number of crashes for each segment and intersection by mode.
2. Apply the Empirical Bayes (EB) method to adjust the SPF predicted value by accounting for the observed value at a given location. This provides a more reliable estimate of crashes. This procedure uses both the the SPF estimate and the observed number of crashes to produce the most reliable estimate of the "true" (expected) crash rate before safety treatment.[4]
3. Choose how to use the information for prioritization:
    a. EB estimates can be used as the expected number of crashes at a given location.
    b. EB estimates can be used directly to focus on high crash locations, and can be divided by the estimated volumes to identify high risk locations
    c. The Potential for Safety Improvement (PSI), or the difference between EB predicted number and SPF-Predicted number, can also be used for prioritization; this indicates the theoretical improvements in crash totals that could be made for a "poorly performing" location. This is because the corrected EB value is the best estimate available of current safety conditions at that location, while the SPF provides the estimate of crashes that would be predicted based on all of the variables in the SPF. Sites with an EB value that is higher than the SPF estimate are theoretically experiencing more crashes than similar sites. This "excess" of crashes at that particular site would likely benefit most from safety improvements.[5]

[4] For an example application of how to calculate EB estimates, see the "before" estimates from the Highway Safety Improvement Manual, section 6.1 Project Evaluation: https://safety.fhwa.dot.gov/hsip/resources/fhwasa09029/sec6.cfm.

[5] An example application of this method is available on pages 8-9 of the HSM introduction: http://www.highwaysafetymanual.org/Documents/HSMP-1.pdf. See Figure 1 of HSM Case Study 4: Development of SPF for Network Screening in Illinois for a graphical depiction of this phenomenon: https://safety.fhwa.dot.gov/hsm/casestudies/il_cstd.cfm. Further detail is available in AASHTO Highway Safety Manual Chapter 4: Network Screening Excess Expected Average Crash Frequency with Empirical Bayes (EB) Adjustment.

AGENDA ITEM #7
January 28, 2020
Addendum

M E M O R A N D U M

January 27, 2020

TO: County Council

FROM: Glenn Orlin, Senior Analyst

SUBJECT: Vision Zero Program

PURPOSE: Update

Since the distribution of the January 23 staff report, further information has become available:

Vision Zero Coordinator. On January 27 the County Executive announced the selection of Wade Holland as the permanent Vision Zero Coordinator (©27-28). Mr. Holland works in CountyStat and has serving as the Interim Vision Zero Coordinator part-time. The Vision Zero 2020 Action Plan is on ©29-71. Mr. Holland present a PowerPoint summarizing the work program.

Pedestrian, Bicycle, and Traffic Safety Town Hall. The Council be holding the Town Hall meeting on Sunday, February 9 from 2:00-4:00pm at Wheaton High School Auditorium.

SHA status report. District 3 staff reports the following:

As part of a comprehensive pedestrian safety review in progress, MDOT SHA is evaluating all appropriate pedestrian safety measures for the MD 355 (Rockville Pike) corridor and Rockville area, including posted speed limit reductions and travel speeds, pedestrian crosswalks, pedestrian signals, traversable barriers along medians, and increased lighting. We are also re-visiting improvements previously implemented along the MD 97 (Georgia Avenue) corridor in the Wheaton-Glenmont and Aspen Hill area, including speed limit reductions.

Since the November County Council update, MDOT SHA has implemented pedestrian safety improvements throughout the MD 355 corridor in Rockville, White Flint and Bethesda. The following improvements are consistent with the approaches outlined in our MDOT SHA Context Driven Guidelines:

- "No Turn on Red" signs were installed for eastbound Marinelli Road at MD 355 and for southbound MD 355 at Marinelli Road, an access point for the White Flint Metro Station.
- Continental crosswalks were installed along MD 355 (Rockville Pike) at MD 187 (Old Georgetown Road), Marinelli Road and Nicholson Avenue.
- MDOT SHA reconstructed several traffic signals along MD 355 (Rockville Pike) in Rockville at Park Road/East Middle Lane and Church Street/Monroe Place to include Accessible Pedestrian Signals (APS)/Countdown Pedestrian Signal (CPS) and ADA compliant ramps.
- Lead Pedestrian Intervals (LPIs) are scheduled to be implemented in February at several locations in the Rockville area, including MD 355 (Rockville Pike) at Park Road/East Middle Lane and MD 586 (Veirs Mill Road) at Atlantic Avenue). The LPIs will provide additional time, typically 3-7 seconds, for pedestrians to establish a presence in the crosswalk at these locations prior to the release of vehicle traffic.
- MDOT SHA worked collaboratively with community members in Bethesda to develop a pedestrian safety plan of action for the MD 355 (Wisconsin Avenue) corridor from Avondale Street/Commerce Lane to Chase Avenue, including Middleton Lane. Pedestrian signal/beacon projects for those locations are currently programmed for those locations.

Since the November County Council update, MDOT SHA has implemented pedestrian safety improvements along the MD 97 (Georgia Avenue) corridor in Wheaton-Glenmont and Aspen Hill. The following improvements are consistent with the approaches outlined in our MDOT SHA Context Driven Guidelines:

- MDOT SHA activated in January a new traffic and pedestrian signal at the MD 97 (Georgia Avenue) at May Street/Rippling Brook Drive intersection in Montgomery County. The new traffic signal at the intersection will improve safety for motorists and pedestrians by providing a marked, signalized crosswalk for pedestrians at a central location within the busy MD 97 corridor; and providing pedestrians, a controlled safe crossing.

Since the November County Council update, MDOT SHA has advanced pedestrian safety improvements along the MD 187 (Old Georgetown Road) corridor in Bethesda. The following improvements are consistent with the approaches outlined in our MDOT SHA Context Driven Guidelines:

- Continental crosswalks were installed along MD 187 (Old Georgetown Road) at Arlington Road near Bethesda Elementary School.
- MDOT SHA held a community walk of MD 187 (Old Georgetown Road) from Cedar Lane to I-495 on Friday December 13, 2019. Community members shared pedestrian and bicycle safety corridor concerns with agency members and elected officials. Prior to the walk MDOT SHA District maintenance and construction forces removed signs along Old Georgetown Road obstructing sidewalks, removed tripping hazards, repaired curbs and widened sidewalks along fire hydrants to enhance pedestrian and bicycle safety and mobility. As part of an active resurfacing project, MDOT SHA is evaluating options within the roadway footprint to further enhance bicycle and pedestrian safety along the corridor.

For Immediate Release: Monday, Jan. 27, 2020

Montgomery County Executive Elrich Names Wade Holland as New Coordinator of County's Vision Zero Program and Addresses Next Steps in the Initiative to Keep Pedestrians, Bicyclists, Drivers Safe

Montgomery County Executive Marc Elrich today introduced Wade Holland as the new fulltime coordinator of the County's Vision Zero program and addressed the next steps he wants implemented to keep pedestrians, bicyclists and drivers safe. The program, which involves numerous County departments and agencies, is dedicated to eliminating traffic-related fatalities and severe injuries by 2030.

The new coordinator, who was selected after a wide search, was introduced in Rockville. Holland has been an employee with the County's CountyStat Office for the past six years, with a focus on public safety and transportation issues. For the past three years, he has served as the part-time coordinator of the County's Vision Zero Steering Committee. He holds a Master of Public Policy Degree from American University, with a specialty in advanced policy analysis.

The Vision Zero Steering Committee, consisting of representatives from a variety of County departments and agencies, has worked to create and implement the 2020 Vison Zero Action Plan. The plan was built with input from key Vision Zero departments to continue implementing roadway improvements and coordinated education and enforcement campaigns. As the fulltime coordinator, Holland will oversee the Vision Zero efforts as a staff member of the County Executive's Office.

The Vision Zero Action Plan can be viewed at https://tinyurl.com/t4ajvpo.

County Executive Elrich said he wanted the Vision Zero Initiative, under Holland's direction, to implement programs in new ways.

"There are high-tech programs that we are working on that are expensive and take time," said County Executive Elrich. "I also want to start looking at low-cost projects that we can do fast. We need projects like intersections with wider corners for pedestrians. We need bright lighting at targeted locations—like intersections—to make sure drivers can see pedestrians. We know that human nature will have people trying to cross at mid-block so we need to consider putting in more mid-block crossings in urban areas of the County. I like the HAWK signals that flash red and force drivers to stop. I know this is a team effort and it takes time, but we need to have programs that get people to change their behavior."

County Executive Elrich on Jan. 15 presented to the County Council his recommended six-year CIP that includes $266.6 million for projects that directly relate to the Vision Zero program. Those recommendations include increases of $9.3 million for pedestrian safety initiatives, $4.5 million to

improve mobility and safety around future Purple Line stations and $4.2 million for Sidewalk Program minor projects.

"Now that the County Executive has challenged us to do things in new ways, I want the 2020 Vision Zero Action Plan to be the floor of what we will do in 2020 and find even more opportunities to make our roadways safer," said Holland. "I appreciate the County Executive's confidence in me, but I much more appreciate his commitment to support all of the work we have been talking about and planning for. He wants us to make a difference and that is what we intend to do."

The video of the event in Rockville can be viewed at https://youtu.be/KfF2o4m5VMY.

###

2020 ACTION PLAN OVERVIEW

The 2020 Vision Zero Action Plan expands on the work completed during the 2018-2019 Two Year Action Plan by implementing recommendations from completed studies, advancing on-going initiatives, and completing open action items. While work on these action items is underway, outreach will start in spring 2020 to develop the long-range strategic plan to further guide the County towards elimination of traffic fatalities by 2030.

This one-year plan has three components: an overview of accomplishments during the 2018-2019 Action Plan, detailed list of the action items to be completed in 2020, and an update of crash statistics.

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TWO-YEAR ACTION PLAN ACCOMPLISHMENTS

The Vision Zero 2018-2019 Two-Year Action Plan built upon successful strategies from Montgomery County's Pedestrian Safety Initiative and integrated Vision Zero and Complete Streets concepts across County Departments and Agencies. The Plan created an ambitious agenda with 41 action items to complete. Highlights from the past few years are shown below as well as a full accounting of all action items in Appendix B.

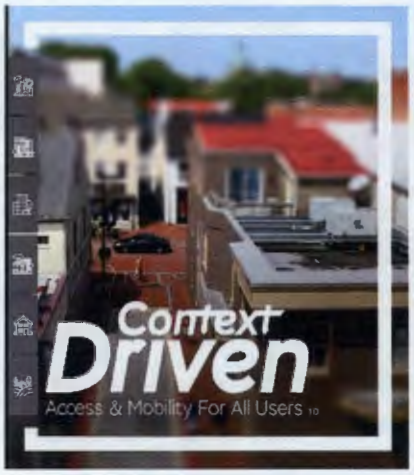
Incorporating Complete Streets Concepts in Design Guidelines

WHAT IS A COMPLETE STREET?

Complete Streets are roadways that are designed and operated to provide safe, accessible, and healthy travelways for all users of our roadway system, including pedestrians, bicyclists, transit riders and motorists. They make it intuitive and safe to cross the street, walk to shops, and bicycle to school.[1]

A key step towards orienting Montgomery County's roadway planning and engineering practices for eliminating serious and fatal crashes was updating design guidelines used to determine how public right-of-way is utilized. The Montgomery County Department of Transportation and Planning Department undertook this project together to update the roadway design, signage, signals, and roadway marking standards as well as propose a replacement for Montgomery County's roadway functional classification system to better organize and categorize streets for how people use them and the land use context.[1] The first guideline to be finalized in August 2019 was the Fire Department Access Performance-Based Design Guide.[2] In partnership with Department of Permitting Services and Fire and Rescue Service, the performance-based design guide still prioritizes access and travel for fire apparatuses while incorporating the goal of compact and walkable neighborhoods. MCDOT and Planning are finalizing major portions of the standards and roadway functional classification in order to have a second public review in winter 2020 and send to the Planning Board and County Council for approval in summer 2020.

In parallel with the County's efforts, the State Highway Administration developed and released in November 2019 its *Context Driven – Access and Mobility for All* guidelines.[3] SHA created these standards to establish new context zones that better match the differing land uses around State-maintained roadways across the State. Within each of the six new context zones, the guide provides text and visual representations of the leading practices that would improve safety for each context.



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Pedestrian and Traffic Signal Upgrades

More Crossing Time for Pedestrians

MCDOT finished updating all traffic signals under its purview, including those maintained by the Maryland Department of Transportation State Highway Administration (MDOT SHA) and maintained by the County, in November 2018 to have a 3.5 feet per second pedestrian crossing timing. The 3.5 feet per second timing is based on federal and MDOT SHA standards and leading practices such as the NACTO Urban Design Guide.[4] The crossing standard is the new floor and MCDOT will continue analyzing crossing times around areas with high pedestrian volumes, higher concentrations of seniors, persons with disabilities, and surrounding schools to determine if additional crossing time is needed.

New Signals and Beacons for Safer Pedestrian Crossings

In November 2017, the same month the Two-Year Action Plan was released, MDOT SHA permitted the installation of Pedestrian Hybrid Beacons also known as High-Intensity Activated Crosswalk (HAWK) beacons. Pedestrian Hybrid Beacons provide for installation of a beacon to stop vehicular traffic for pedestrians at un-signalized locations where a full traffic signal would not be appropriate. MCDOT has installed and activated numerous pedestrian hybrid beacons over the last few years to improve safety for pedestrian crossings, including at Muddy Branch Road and Harmony Hall Road / King James Way, Aspen Hill Road at Northgate Plaza Shopping Center (pictured below), and Tuckerman Lane at the Bethesda Trolley Trail. Additional HAWK locations have been planned and designed recently.

Planning and Building a Low-Stress Bike Network

During the Two-Year Action Plan, there were multiple advancements for creating a low-stress bicycle network across the county. In November 2018, the County Council adopted an updated Bicycle Master Plan with the goal of making Montgomery County a world-class bicycling community where "cyclists of all ages and abilities are comfortable and safe."[5] In building the Plan, the Planning Department identified priority routes for upgraded cycling infrastructure to create better connectivity in and between activity centers.

MCDOT began planning and building protected bike lanes in Silver Spring, White Flint, Bethesda, and Wheaton. In Downtown Silver Spring, protected bike lanes were built on Spring Street, 2nd/Wayne Avenue, and Cameron Street as part of the Silver Spring Circle bike network. In White Flint, protected bike lanes were installed on Nebel Street, Executive Boulevard, and Woodglen Drive. Designs for the Bethesda Loop were finalized in 2019 with construction to begin in spring 2020. A study is underway for a protected bike lane along Amherst Avenue in Wheaton.

Mid-Atlantic Region's First Protected Intersection

In order to safely connect the Spring Street and Second Avenue protected bike lanes, MCDOT implemented the first protected intersection in the Mid-Atlantic in October 2019. The main features of the intersection are corner islands that force drivers to slow when turning, providing improved visibility. The islands reduce crossing distances from one side of the street to the other. These elements reduce the possibility of collisions, and if a collision does occur, the likelihood of death or serious injury is reduced because of the lower turning speeds. The new intersection has ADA-compliant ramps and detectable warning surfaces. The project also includes the first bicycle traffic signal in Maryland, where the project crosses Colesville Road.

Improved Park Trail Crossings

A new Capital Improvements Program was created for the Parks Department to assess and implement safety improvements for trail crossings. In 2018 and 2019, Parks studied and implemented safety improvements at over 15 hard and natural surface trail crossings throughout the county including along popular trails such as Rock Creek, Sligo Creek, and Capital Crescent Trail. Below are two examples of trail enhancements applied by Parks.

Garrett Park Road crossing of the Rock Creek Trail. Improvements included:

- Re-aligning the crosswalk,
- Re-constructing the driveway entrance for safety,
- ADA-compliant landing pads,
- Improved signage and markings.

Beach Drive crossing of the Rock Creek Trail at Stanhope Road. Improvements included:

- Re-aligning the crosswalk,
- ADA-compliant landing pads,
- Clearing vegetation to enhance visibility,
- Improved signage and markings.

High Visibility Enforcement

Stay Alert, Stay Alive Campaign

As the first major education and enforcement campaign for the Two-Year Action Plan, the County Executive launched the *Stay Alert, Stay Alive* campaign in April 2018 to curb distracted driving. The multi-faceted campaign included a media and enforcement kickoff in Wheaton, social media messaging, and high visibility enforcement by Montgomery County Police throughout the month. The campaign resulted in over 1,400 warnings and citations issued in April and received publicity from every local TV station, including Spanish language news, to spread the word about the dangers of distracted driving.

Pedestrian Right-of-Way Enforcement

The Montgomery County Police Department (MCPD) leads Maryland and the DC region in dedicated enforcement for pedestrian safety. MCPD utilizes crash data to determine when and where to focus its enforcement efforts to maximize the dedicated time. MCPD performed 294 pedestrian safety details in FY18 and increased to 401 details in FY19. Across the two years, officers tallied 3,269 hours of dedicated enforcement.

3,269
Hours

Amount of dedicated MCPD enforcement for pedestrian safety in 2018 and 2019

Holiday Alcohol Task Force

From Mid-November to New Year's Day, the Montgomery County Police partnered with the Sheriff's Department and local and state police departments to take impaired drivers off the road during the busy end-of-year holiday season. In 2018, the task force arrested 323 people and a slightly lower amount of 288 in 2019. The task force utilizes impaired driving crash data to prioritize patrol routes. Both years' task force work was dedicated to Montgomery County Police Officer Noah Leotta, who was killed by a drunk driver while on-duty as part of the 2015 task force.

Expanded Central Traffic Enforcement Unit

In 2019, Montgomery County Police began a pilot to add 12 officers to the Central Traffic Unit to conduct high visibility enforcement. The primary focus of these additional officers was extra enforcement during the morning and evening rush hours. During 2019, the extra officers made 2,775 traffic contacts with 3,757 citations, warnings and repair orders issued.

Education and Outreach Throughout the County

Bike and E-Scooter Education Classes

MCDOT, in partnership with e-scooter companies and the Washington Area Bicyclist Association (WABA) provided e-scooter and bike riding classes in 2018 and 2019. E-scooter classes were hosted around the County to help residents learn to ride and park these new mobility options in a safe manner. Classes were mandated by Montgomery County as part of the agreement for e-scooter rental companies to operate in the county. Bicycling classes were available for a variety of age groups. MCDOT sponsored a pop-up traffic garden (top right photo) in July 2019 at Ward Circle Park to create real life traffic situations in a safe setting for children. WABA courses were aimed at older adults and offered courses for those who never learned to ride a bike and courses to gain confidence to ride in and around urban areas. These offerings will continue in 2020.

Pop-up Events for Distracted Driving Campaign

To create relevant distracted driving messages for Montgomery County, the Vision Zero Program held two pop-up events and one focus group to collect feedback on what messaging resonated with the public from draft marketing materials. A focus group of County employees was held in spring 2019 to seek input from first responders, public health, and transportation subject matter experts. Two pop-up events were held in summer 2019 in Wheaton and Rockville to gauge resident and visitor interest in the various messages drafted. The final materials will be used during National Distracted Driving Month in April 2020.

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Be Safe, Be Seen Outreach Program

Montgomery County Government departments and agencies combined their resources in November 2019 to launch a campaign to make drivers, pedestrians, and bicyclists aware of the added perils that come with time changes and decreased hours of afternoon daylight. The County's Police Department, Department of Transportation, Fire and Rescue Services, Public Schools, CountyStat, and Office of Public Information joined together on the campaign that distributed safety literature and handouts designed to raise awareness and safety on our streets. The campaign targeted bus stops, schools, transit centers, and parking facilities and reached thousands of residents.

SAFE ROUTES TO SCHOOLS (SRTS) OUTREACH

MCDOT worked with Public Schools to run many successful Safe Routes to Schools education events. In addition to providing resources and information to students, parents, and faculty at ten Back-to-School Nights, MCDOT hosted Walk-to-School Day at Arcola Elementary School with over 500 participants. MCDOT's Safe Routes to Schools program regularly hosts pedestrian and bicyclist safety events at schools throughout the County, including the popular "Bike Rodeo" that teaches kids safe cycling.

County and State Collaboration

Given that the majority of serious and fatal crashes occur on State-maintained roadways, closer partnerships with the State Highway Administration (SHA) and Maryland Highway Safety Office (MHSO) were crucial elements of the Two-Year Action Plan. During 2018 and 2019, Montgomery County worked closely with both state agencies for engineering and education initiatives.

Shortly after the Two-Year Action Plan was finalized, County and State engineers sat together to review the High Injury Network to identify potential short- and medium-term changes that could be made to improve safety. Given the concentration of serious and fatal crashes in and around the Wheaton Triangle, the initial focus was for Georgia Avenue and Veirs Mill Road. Along Georgia Avenue and Veirs Mill Road, SHA lowered speed limits to ones more appropriate for the urban environment. For Georgia Avenue, travel lanes were narrowed to reduce vehicle speeds and a new signal was installed at Georgia Avenue and May Street. MCDOT installed "Do Not Cross" curb markers in English and Spanish to encourage pedestrians to use the nearby crosswalk. MCDOT has also offered to enter into cost sharing agreements with the State for additional safety enhancements along Georgia Avenue.

The County and State also partnered on pedestrian safety programs in Wheaton. In addition to the Wheaton Urban District Team, the County and State utilized bi-lingual street teams to engage with pedestrians crossing outside the crosswalk and collect their safety concerns. MHSO provided a grant to MCDOT to bring a virtual reality challenge to the County that raises awareness for drivers about common crash scenarios with pedestrians and cyclists. The first events were held at Veteran's Plaza in Silver Spring in November 2018 and Westfield Wheaton Mall during the busy December shopping season.

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2020 ACTION PLAN

The goal of zero may appear impractical, yet no higher number should be acceptable. Balancing immediate action with long-term strategy demands focus and patience in equal measure. Additionally, Vision Zero requires a new way of doing business from agencies and staff that have been working diligently in this field for years. The 2020 Action Plan builds from the 41 action items from the 2018-2019 Action Plan to implement projects and priorities identified, and continue work for on-going projects.

To reach the goal of zero serious and fatal collisions by 2030, the 2020 Action Plan lays out specific activities with deadlines for implementation. All 32 action items are built around five key action areas: Engineering; Enforcement; Education and Training; Traffic Incident Management; and Law, Policy, and Advocacy.

ENGINEERING

- **LEAD:** Department of Transportation
- **KEY OUTCOME:** Reduction in serious and fatal collisions in the High Injury Network

ENFORCEMENT

- **LEAD:** Police Department
- **KEY OUTCOME:** Hours of dedicated enforcement for factors contributing to serious and fatal collisions

EDUCATION AND TRAINING

- **LEAD:** Public Information Office
- **KEY OUTCOME:** Increased awareness of dangerous driving, biking, and walking behaviors

TRAFFIC INCIDENT MANAGEMENT

- **LEAD:** Fire and Rescue Service
- **KEY OUTCOME:** Maintain response times for traffic collisions with injuries based on department standards

LAW, POLICY, & ADVOCACY

- **LEAD:** Vision Zero Steering Committee
- **KEY OUTCOME:** Updates to laws and policies required to implement Vision Zero

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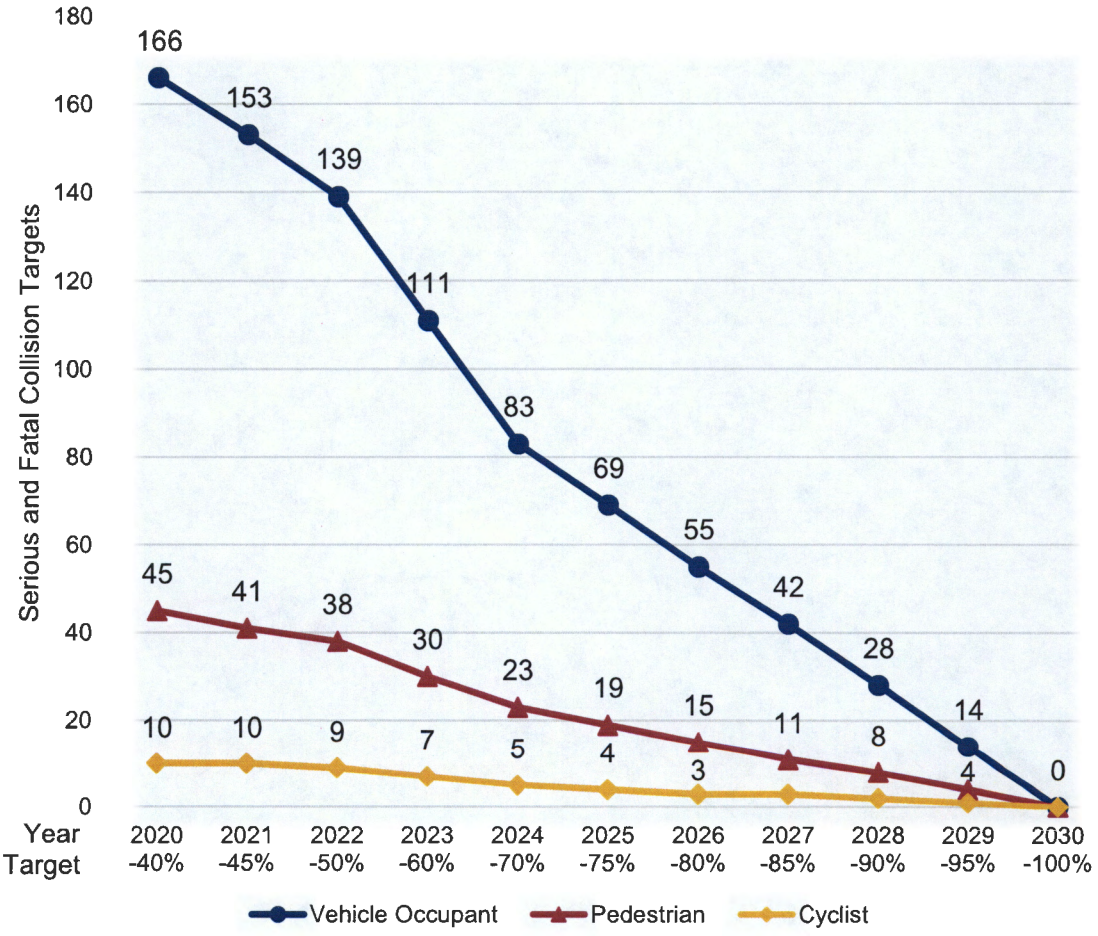
Collision Reduction Targets

The 2020 Action Plan reaffirms the interim targets set in the 2018-2019 Action Plan to get to zero serious and fatal collisions on our roadways by 2030. By the end of 2020, the goal is a 40% reduction in serious and fatal for all roadway users.

The reduction targets were set using the five-year average from 2012 to 2016 as a baseline. The most significant reductions are in the middle years, 2022 through 2025, as completed engineering projects start to bear fruit. In the final four years, the pace slows to 5% per year reductions as the last few collisions will be the toughest to eliminate.



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ENGINEERING

LEAD: Montgomery County Department of Transportation (MCDOT)

Key Outcome: Reduction in serious and fatal collisions in the High Injury Network

Vision Zero requires an evidence-based, safe systems approach for all of the County's transportation infrastructure. The safe systems approach prioritizes safety above all else and designs such that roadway users' mistakes do not result in serious injuries or fatalities.

During the Two-Year Action Plan, many action items were focused on updating standards and studying areas for potential improvements. With these studies completed, MCDOT will implement the recommendations.

High Injury Network Roadway Modifications	
Lead: Transportation	**Support:** State Highway Admin.
Action: Design and begin construction on two County-identified High Injury Network (HIN) corridors.	
Why do this: Serious and fatal injury crashes are concentrated along specific corridors in the County. Prioritizing these routes for modification can have the greatest impact on reducing serious and fatal injuries.	
Deadline: Complete design and begin construction for improvements on two HINs.	

High Injury Network Signal Modifications	
Lead: Transportation	**Support:** State Highway Admin.
Action: Design and begin implementation of signal phasing changes along the Shady Grove HIN from Frederick Road to I-270	
Why do this: Focus on specific corridors in the County where serious and fatal crashes are concentrated. Signal modifications, such as implementing leading pedestrian intervals, can improve safety at a lower cost.	
Deadline: Complete design and begin implementation of signal modifications at County controlled signals in the Shady Grove HIN from Frederick Road to I-270 in 2020.	

Implement Pedestrian Road Safety Audit (PRSA) Recommendations	
Lead: Transportation	**Support:** State Highway Admin.
Action: Implement County-controlled recommendations for the Middlebrook Road and Bel Pre Road PRSA.	
Why do this: Address remaining recommendations resulting from the pedestrian roadway safety audits performed on 15 roadway segments since 2008.	
Deadline: Improve pedestrian crossings along Bel Pre Road; install signal at Wisteria Drive and Crystal Rock Drive and implement lane narrowing along Middlebrook Road.	

Develop Cost Estimates for Full High Injury Network Buildout	
Lead: Transportation	**Support:** N/A
Action: Develop planning level cost estimates for full buildout of High Injury Network safety improvements.	
Why do this: To build out a budget and schedule for Vision Zero related improvements along high crash corridors.	
Deadline: Complete planning level cost estimates to support Capital Improvement Programs implementation.	

Finalize Complete Streets Design Guidelines	
Lead: Transportation, Planning, County Council	**Support:** N/A
Action: Publish and approve the updated complete streets design guidelines started under the Vision Zero Two-Year Action Plan.	
Why do this: MCDOT and the Planning Department are updating standards and roadway classifications to bring all standards in line with Vision Zero goals and principles.	
Deadline: Have design guideline approved by County Council in summer 2020.	

Implement Bus Stop Audit Recommendations	
Lead: Transportation	**Support:** WMATA, State Highway Admin.
Action: Implement Country-controlled bus stop audit recommendations for one identified corridor in 2020.	
Why do this: A significant number of pedestrian crashes are associated with transit users crossing to/from transit stops. Redevelopment or even small changes in surroundings can modify pedestrian desire lines, driving the need for continual reevaluation of transit stop placements.	
Deadline: Complete County controlled audit recommendations for one corridor in 2020.	

Evaluate Trail Crossings and Intersections	
Lead: Parks, Transportation	**Support:** State Highway Admin.
Action: Assess 15 trail crossings for safety upgrade needs.	
Why do this: Trail crossings create conflict points between pedestrian and bicyclists and motor vehicle traffic. Improvements can lead to a better and safer user experience for all parties crossing the trails.	
Deadline: Complete 15 trail crossing assessments in 2020.	

State/County Project Collaboration	
Lead: Transportation, State Highway Admin.	**Support:** County Executive's Office
Action: Finalize short- and medium-term recommendations for Veirs Mill Road. Begin construction on short-term improvements in 2020. Begin design on mid-term improvements in 2020.	
Why do this: The majority of serious and fatal collisions occur on state-maintained roadways. These joint projects will encourage a positive working relationship to advance needed improvements.	
Deadline: Construct two new signal / pedestrian beacons along Veirs Mill Road for pedestrian safety in 2020.	

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Traffic Signal and Beacon Installation	
Lead: Transportation	**Support:** State Highway Admin.
Action: Implement High-Intensity Activated Crosswalk (HAWK) beacons at Democracy Blvd & Walter Johnson High School, Willard Ave & The Hills Plaza, and Summit Ave & Brookfield Dr. Activate a pedestrian activated beacon at MacArthur Blvd & Dunrobbin Dr.	
Why do this: Many areas in the County have long distances between signalized crossings. Using pedestrian beacons and traffic signals provide for safer crossings.	
Deadline: Implement at minimum 3 HAWKs and 1 pedestrian beacon in 2020.	

Fill Sidewalk Gaps	
Lead: Transportation	**Support:** State Highway Admin.
Action: Utilize the data collected in 2019 to finalize sidewalk inventory and identify priority locations and begin design of new sidewalk.	
Why do this: The sidewalk inventory completed in 2019 identified important network gaps that if filled would improve pedestrian safety.	
Deadline: Begin design initiated on high priority sidewalk locations.	

Continue Expanding Low-Stress Bicycle Network	
Lead: Transportation	**Support:** State Highway Admin., Parks, Planning
Action: Construct bike lanes for the Capital Crescent Surface Trail (except the portion along 47th Ave), Woodmont Ave (from Montgomery Lane to Leland Street), and Marinelli Road. Build out Neighborhood Greenway pilot in Aspen Hill. Complete design of Amherst Avenue in Wheaton.	
Why do this: A low-stress bicycle network allows for more people to bike and create needed separation from traffic.	
Deadline: Design and / or construct bike lanes projects and segments identified above in 2020.	

ENFORCEMENT

LEAD: Montgomery County Police

Key Outcome: Hours of dedicated enforcement for factors contributing to serious and fatal collisions

Vision Zero needs more than improved transportation infrastructure; it requires building a culture of safety. To encourage safe behavior, Montgomery County utilizes evidence-based law enforcement methods, both automated and with police officers.[6] For example, publicized sobriety checkpoints can reduce alcohol-related collisions by 17%.[7] Enforcement actions are combined with education efforts to maximize impact and ensure equitable outcomes.

Continue Fatal Crash Review Team	
Lead: Police	**Support:** CountyStat, Transportation, Planning, State Highway Admin.
Action: The multi-disciplinary review team reviews each fatal crash, starting with 2017 crashes, to examine all possible causal factors and present findings to the public.	
Why do this: The team ensures diverse perspectives are represented when determining potential countermeasures to respond to traffic fatalities.	
Deadline: Finalize review of 2017 cases in 2020.	

High Visibility Enforcement Against Dangerous Behaviors	
Lead: Police	**Support:** Public Information, Transportation
Action: Implement a high visibility enforcement program for 2020 that prioritizes enforcement activities against the most dangerous behaviors (speeding, distraction, yielding right-of-way, impairment, seat belt use, etc.) similar to San Francisco's "Focus on the Five" program.[8]	
Why do this: The Vision Zero Equity Task Force recommended implementing a program like "Focus on the Five" to ensure that enforcement is focused on curbing dangerous behavior and less on other traffic violations that present smaller safety issues.	
Deadline: Implement a version of "Focus on the Five" in 2020.	

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Issue New Contract for Automated Enforcement Program	
Lead: Police	**Support:** Procurement
Action: Issue a new contract for a vendor to provide red light and speed cameras that will increase the total amount of cameras available for automated enforcement.	
Why do this: Automated enforcement has been proven to curb dangerous driving behaviors when used at appropriate locations in the County.	
Deadline: Issue a new contract by fall 2020.	

Officer Training for Roadway Engineering	
Lead: Police	**Support:** Transportation
Action: Train police officers on roadway engineering and complete streets to help them detect issues and communicate problems to MCDOT and SHA.	
Why do this: Police officers investigate collisions in the County and can help provide necessary information to roadway engineers if the officers are familiar with leading practices and language used in traffic engineering.	
Deadline: Complete trainings for traffic officers by June 2020.	

EDUCATION AND TRAINING

LEADS: Vision Zero Coordinator, Transportation, Public Information Office

Key Outcome: Increased awareness of dangerous behaviors

Creating a safety culture in Montgomery County is not limited to issuing warnings and citations. The County must engage the public and County employees using a variety of outreach methods to instill safe behaviors. Tied with enforcement, Montgomery County will be a safe place to get from point A to point B.

Update Outreach and Communication Strategy	
Lead: County Executive's Office (Vision Zero Coordinator)	**Support:** Public Information, Transportation, Fire and Rescue, Planning
Action: Review and update the Vision Zero communications and outreach strategy to include more guidance for departments on Vision Zero/complete streets messaging.	
Why do this: The communications strategy completed in 2018 focused more on messaging around dangerous behaviors and needs to be expanded to help departments explain and adhere to Vision Zero concepts.	
Deadline: Finish updates to guidelines by June 2020.	

Host Bicycle Rodeos and Expand On-Bike Education	
Lead: Transportation, Public Schools	**Support:** Fire and Rescue
Action: Host at minimum five bicycle rodeos at different schools during 2020.	
Why do this: School-aged children are overrepresented in bicycle collisions. Bicycle rodeos provide a safe place for elementary and middle school students to learn safe bicycle riding skills.	
Deadline: Host at minimum five bicycle rodeos at different schools in 2020	

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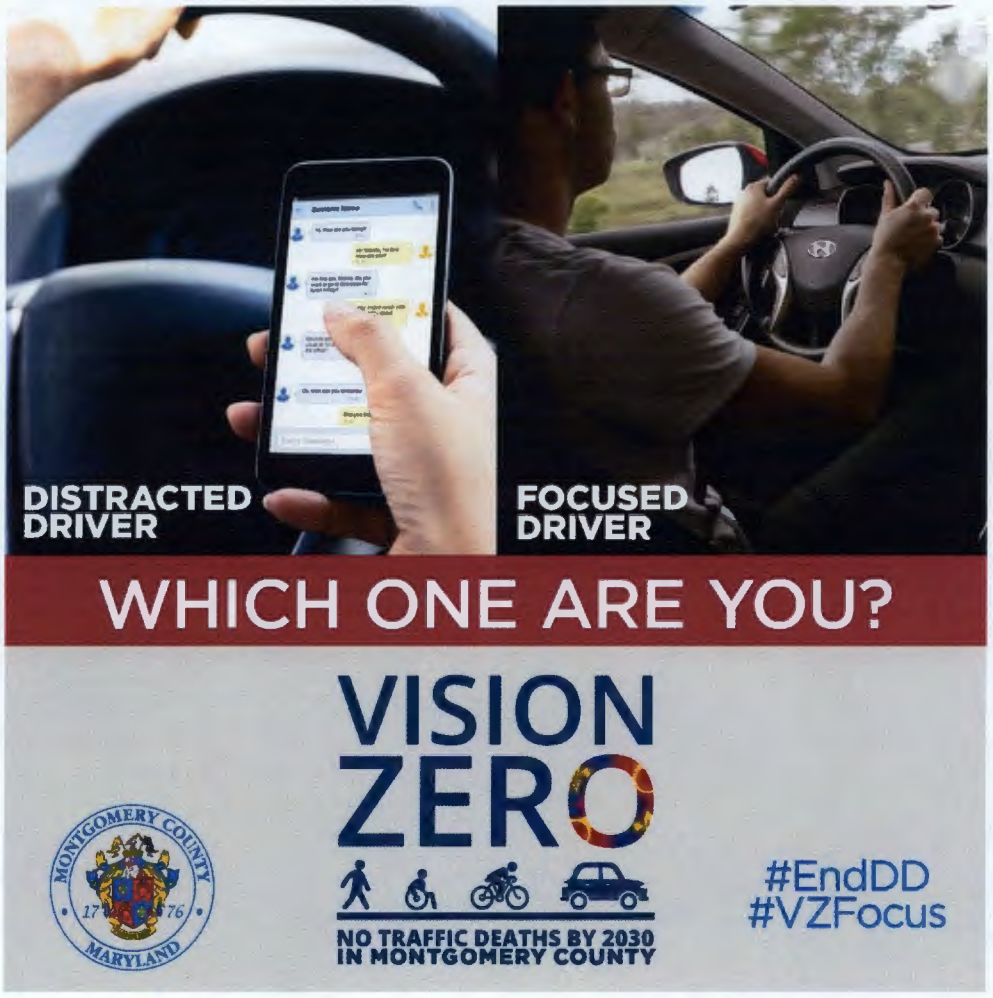
Safe Routes to Schools Education Program	
Lead: Transportation, Public Schools	**Support:** Police
Action: Host outreach events and campaigns that teach students safe walking, biking, and riding practices.	
Why do this: Education is a core element of Vision Zero. Adding safety education to Montgomery County Public Schools' curriculum is important to ensure our vulnerable users are given the best information and resources to be safe.	
Deadline: Hold at minimum 10 events at Montgomery County Public Schools focused on safety education.	

Launch Distracted Driving Campaign	
Lead: County Executive's Office (Vision Zero Coordinator)	**Support:** Public Information, Transportation
Action: Using materials developed in 2019, launch a countywide distracted driving campaign to raise awareness of the dangers of distracted driving.	
Why do this: Nearly half of all collisions in Montgomery County involve some form of distracted driving, with mobile phone distraction becoming increasingly prevalent.	
Deadline: Launch distracted driving campaign in April 2020.	

Cross-Departmental Outreach Events	
Lead: Vision Zero Steering Committee	**Support:** Public Information, Transportation, Police, Fire and Rescue, County Executive's Office
Action: Host two public ped/bike/traffic safety events utilizing key safety departments.	
Why do this: Using multiple departments allows for more staff and communication channels to be utilized and amplify the safety message while also building relationships across departments.	
Deadline: Complete at minimum two public ped/bike/traffic safety events in 2020.	

Engage Hard-to-Reach Communities	
Lead: County Executive's Office (Vision Zero Coordinator)	**Support:** Planning, Public Information, Transportation, Police
Action: Identify opportunities to reach and engage communities in the County's Equity Emphasis Areas and vulnerable populations, such as students, seniors, and persons with disabilities.	
Why do this: Not all neighborhoods may be aware of or how to participate in Vision Zero.	
Deadline: Identify communities for outreach and additional engagement by April 2020.	



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TRAFFIC INCIDENT MANAGEMENT

LEADS: Montgomery County Fire and Rescue Service, Montgomery County Police

Key Outcome: Maintain response times for traffic collisions with injuries based on departments standards

Montgomery County residents have access to level 1 and level 2 trauma centers and an accredited Fire and Rescue Service that can decrease the morbidity and mortality of a collision through proper transport and care.[9] The Traffic Incident Management action area will ensure that when collisions occur in the County, prompt care will be provided.

Rapid response to car collisions is crucial, but will not come at the expense of safety for first responders. Collisions are a leading cause of fatalities for both police and fire public safety employees.[10,11] The County will ensure the protection of the public and its employees through safe responses and on-scene traffic management.

Provide Prompt Emergency Medical Service	
Lead: Fire Rescue Service	**Support:** Police
Action: Maintain time to scene and time to hospital response times that meet or exceed department standards	
Why do this: A key measure of service quality for Fire and Rescue service is a prompt response to medical emergencies	
Deadline: Ongoing	

Update Traffic Incident Management Policies	
Lead: Police, Fire Rescue Service	**Support:** County Executive's Office (Vision Zero Coordinator)
Action: Utilize framework developed during 2019 to revise and sync MCFRS and MCPD traffic incident management plans.	
Why do this: Ensure safe and collaborative response to traffic collisions. Secondary crashes are often more severe than the primary crash.	
Deadline: Finish updating traffic incident management policies by December 2020.	

LAW, POLICY, AND ADVOCACY

LEAD: Vision Zero Steering Committee

Key Outcome: Updates to laws and policies required to implement Vision Zero

Vision Zero is an all-hands-on-deck approach that requires the participation of all levels of government and the public to reach zero serious and fatal collisions. Actions in the Law, Policy, and Advocacy area seek to improve the way traffic safety is managed in Montgomery County by changing laws and policies that do not align with Vision Zero and advocating for the necessary tools to fully enact the Vision Zero strategy.

Hire Vision Zero Coordinator	
Lead: County Executive's Office	**Support:** N/A
Action: Hire a full-time Vision Zero Coordinator in the Office of the County Executive.	
Why do this: Vision Zero cuts across multiple departments and agencies and requires a single point of contact to ensure all projects are moving and meeting deadlines.	
Deadline: Hire and bring on-board Vision Zero Coordinator in February 2020.	

Build the 10-Year Vision Zero Strategy	
Lead: County Executive's Office (Vision Zero Coordinator)	**Support:** Transportation, Public Information, Police, Fire and Rescue
Action: Build the 10-Year Vision Zero Strategy that will guide the County towards eliminating serious and fatal injuries for our roadways by 2020.	
Why do this: A long-term vision needs to be developed to drive annual workplans that will reduce and eventually eliminate serious and fatal crashes in Montgomery County.	
Deadline: Begin outreach by April 2020 and complete strategy by December 2020.	

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Systematic Roadway Safety Analysis	
Lead: Planning	**Support:** Transportation, County Executive's Office
Action: Complete a systematic review of all roadways in the county that incorporates the current built environment and crash history to determine unsafe roadways.	
Why do this: The systematic safety analysis allows Planning and Transportation to identify dangerous infrastructure and identify changes that can be made systemwide to improve safety.	
Deadline: Complete systematic safety analysis by January 2021.	

Update Subdivision Staging Policy	
Lead: Planning	**Support:** Transportation, County Executive's Office, County Council
Action: Update the Subdivision Staging Policy by November 2020.	
Why do this: The subdivision staging policy determines the essential public facilities that are necessary when development occurs and needs to align with Vision Zero principles.	
Deadline: County Council adoption of updated policy by November 2020.	

Continue Support to Municipalities	
Lead: County Executive's Office (VZ Coordinator)	**Support:** Transportation, Police
Action: Continue support to County municipalities in developing their Vision Zero Action Plans and identifying areas for safety improvements.	
Why do this: Ensure that city, county, and state are moving in the same direction for policies and practices to eliminate serious and fatal crashes from our roads.	
Deadline: Continue support to municipalities in 2020.	

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New Fleet Vehicle Purchasing Policy	
Lead: County Executive's Office (VZ Coordinator)	**Support:** DGS-Fleet Management, Procurement, Police, Fire and Rescue
Action: Adopt new fleet vehicle purchasing policy to include purchase specifications for crash avoidance systems, side and under-run guards, mirrors and lighting.	
Why do this: Collision avoidance systems can lower the probability of being in a collision. For example, vehicles equipped with automatic braking reduce rear-end crashes by 40%.[12]	
Deadline: Finalize updated purchasing policy by December 2020.	

Review and Update Roadway and Sidewalk Closure Policies	
Lead: Permitting Services, Transportation	**Support:** County Executive's Office
Action: Review and modify roadway and sidewalk closure policies to ensure all roadway users are provided safe accommodations during temporary closures.	
Why do this: While sidewalk closures may be necessary for construction, there should not be a compromise in safe travel for pedestrians and cyclists during construction.	
Deadline: Finalize updated closure policies by July 2020.	

Review and Update Trash and Recycling Bin Placement Policy	
Lead: Environmental Protection	**Support:** County Executive's Office, Transportation
Action: Review and modify County code and trash collection policies to keep refuse off of sidewalks. Develop education campaign for updated policies.	
Why do this: In areas with older, narrower sidewalks, obstructions such as trash bins can create a barrier for safe passage and force people into the roadway.	
Deadline: Finalize updated bin placement policy by July 2020.	

Build Equity Considerations into Capital Improvement Project Selection	
Lead: Transportation, County Executive's Office	**Support:** County Council, Planning
Action: Develop a new project recommendation process that utilizes crash, demographic, and infrastructure data as well as historical funding as detailed on page 9 of the Vision Zero Equity Task Force Framework to ensure equitable selection of Capital Improvement Projects.	
Why do this: The Vision Zero Equity Task Force recommended a more data-informed approach to selecting and funding projects to ensure an equitable and transparent project selection process.	
Deadline: Finalize new selection process by December 2020.	

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THE CURRENT STATE OF ROADWAY SAFETY: DATA ANALYSIS

The Two-Year Action Plan set an ambitious goal of reducing serious and fatal collisions on Montgomery County roads by 35% compared to the 2012-2016 average. By overall count of serious and fatal crashes, the target of 240 crashes was missed by 25 crashes based on preliminary 2019 crash data. By roadway user, motor vehicle occupants exceeded the goal by 4 crashes, pedestrians missed the goal by 29, and bicyclists were at the target of 11. The data show a need to continue focusing on efforts to improve pedestrian safety in order to meet annual targets.

Roadway User	2019 Target	2019 Actual
Motor Vehicle Occupants	180	176
Pedestrians	49	78
Cyclists	11	11
TOTAL	**240**	**265**

Serious and Fatal Collision Trends 2012-2019

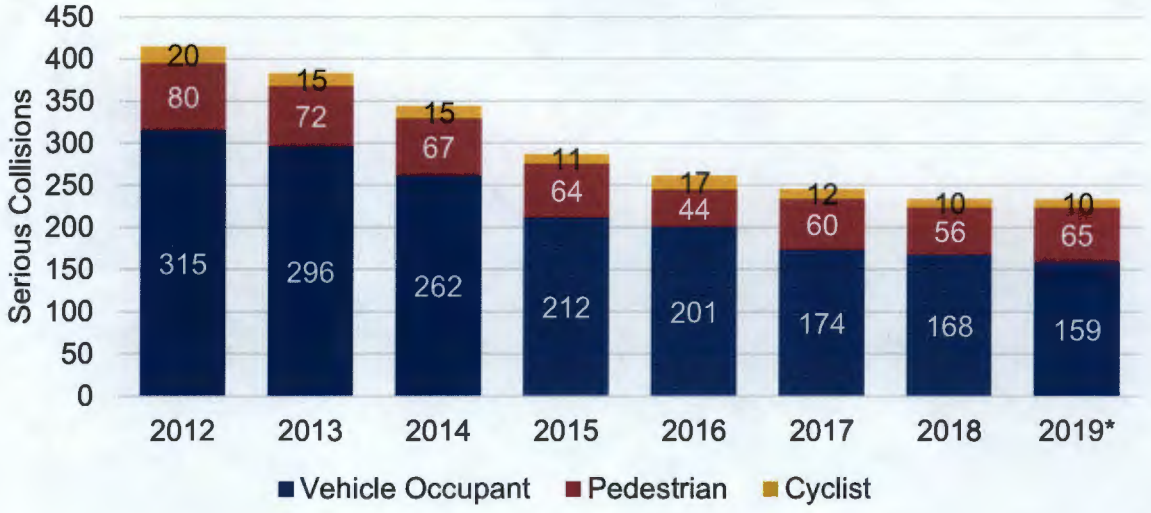
During the 2012-2019 period, serious crashes have declined every year, but fatalities have averaged around 30 per year. 2018 had a decade's low number of fatalities for motor vehicle occupants at 13 but bounced back up to 17 in 2019. Pedestrian fatalities remained in the 10-15 per year range and cyclists at 1 per year.

Serious and Fatal Collisions by Year, 2012-2019

*2019 are preliminary and subject to change after audit and closeout in spring 2020.

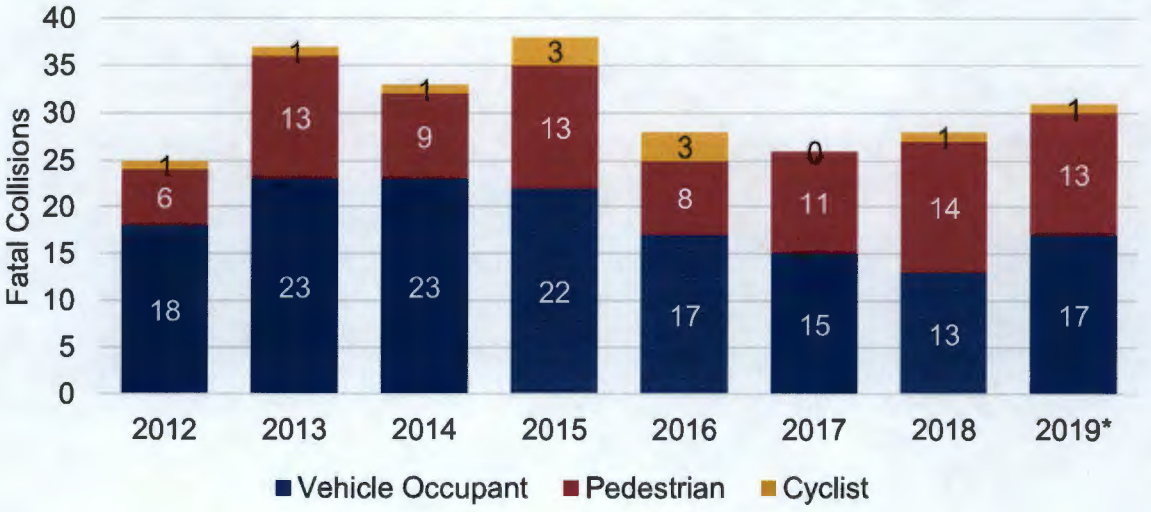
Serious Collisions by Roadway User, 2012-2019

Serious collisions declined each year between 2012 and 2018. The rate of decline has slowed in recent years with 2018 and 2019 both having 234 serious crashes. The 65 serious pedestrian-involved crashes in 2019 were above the recent 5-year average of 58.



Fatal Collisions by Roadway User, 2012-2019

In 2019, Montgomery County had 31 fatal crashes with 32 fatalities. The number of fatal crashes has averaged around 30 for the past 7 years. After four consecutive years of declining fatalities for motor vehicle occupants, 2019 had four more fatalities than 2018.



*2019 are preliminary and subject to change after audit and closeout in spring 2020.

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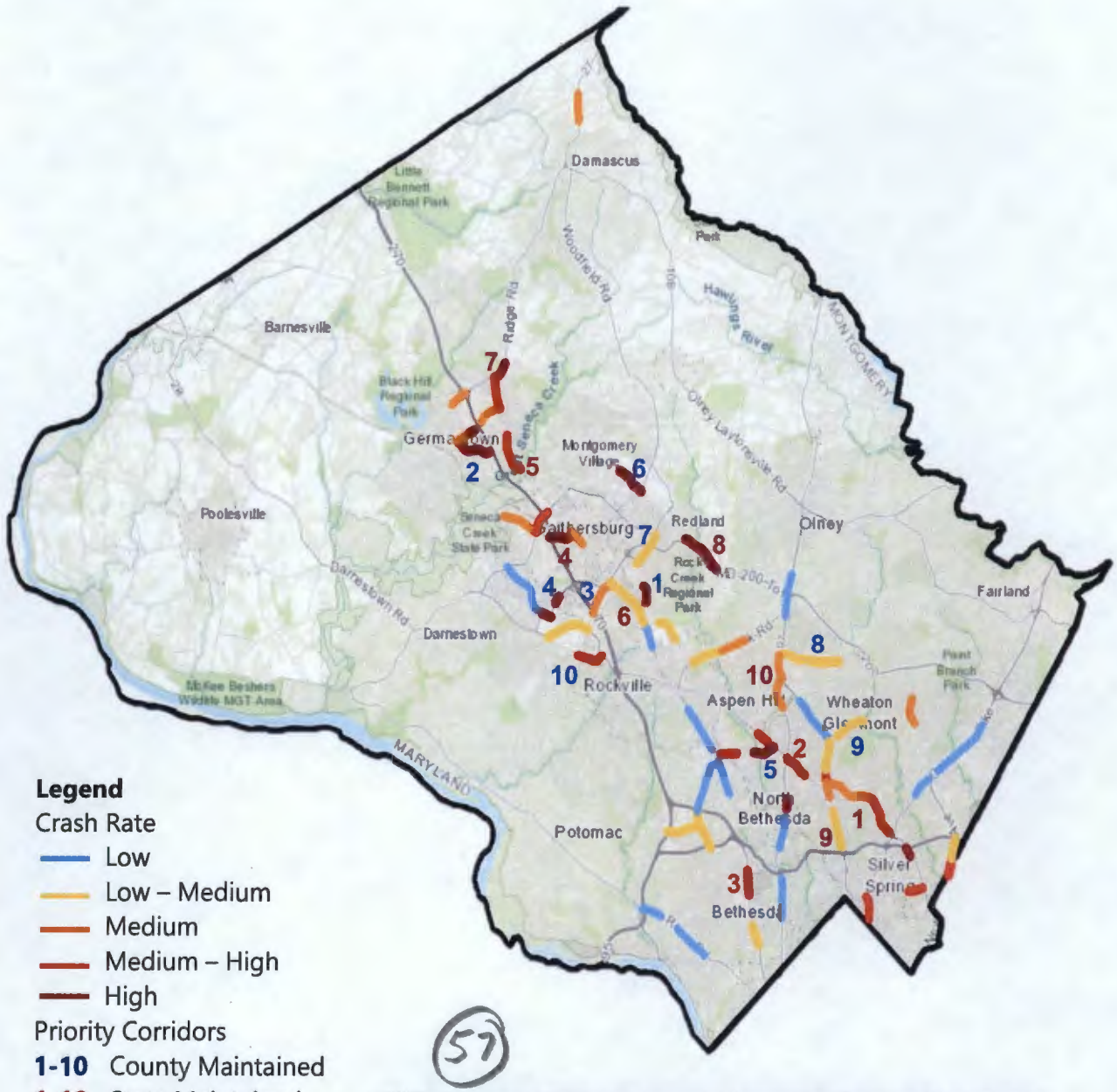
High Injury Network

The map below highlights the roadway segments with 5 or more serious or fatal collisions and one or more collisions per mile per year based on the initial 2012-2016 Vision Zero study. Numbered segments display the highest risk road segments, which collectively account for 13% of non-interstate collisions, but only 0.7% of the entire roadway network. These high-risk roadways make up the County's high injury network and will be the first areas scrutinized for potential engineering improvements. High injury network roadways were concentrated in Mid-County (Wheaton, Glenmont, Aspen Hill) and UpCounty (Germantown and Gaithersburg) regions.



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Basemap Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

PRIORITY CORRIDORS FOR COUNTY MAINTAINED ROADS

	Roadway	Total Collisions	Collisions per Mile per Year	Collisions per 100M VMT**
1	**Crabbs Branch Way** From Reland Rd to Indianola Dr	9	3.8	51.9
2	**Middlebrook Rd*** From Germantown Rd to I-270	15	2.6	33.1
3	**Shady Grove Rd** From Frederick Rd to I-270	14	2.7	18.3
4	**Sam Eig Hwy** From Fields Rd to Diamondback Dr	5	4.9	42.8
5	**Randolph Rd*** From Veirs Mill Rd to Rock Creek Park	9	2.6	30.7
6	**Snouffer School Rd** From Woodfield Rd to Flower Hill Way	9	2.0	25.4
7	**Shady Grove Rd** From Metro Access Rd to Midcounty Hwy	11	2.3	12.9
8	**Bel Pre Rd*** From Layhill Rd to Georgia Ave	10	1.0	12.5
9	**Randolph Rd** From Kemp Mill Rd to Gllenallan Ave	9	2.0	13.6
10	**Darnestown Rd** From W Montgomery Ave to Shady Grove Rd	6	1.5	20.4

*Roadway overlaps with High Incidence Area for Pedestrian Safety Initiative
**VMT = Vehicle Miles Traveled

PRIORITY CORRIDORS FOR STATE MAINTAINED ROADS

	Roadway	Total Collisions	Collisions per Mile per Year	Collisions per 100M VMT**
1	**University Blvd W*** From Georgia Ave to Colesville Rd	30	2.2	18.5
2	**Veirs Mill Rd** From Connecticut Ave to Newport Mill Rd	12	3.3	24.5
3	**Rockville Pike** From Jones Bridge Rd to Cedar Ln	12	3.6	22.1
4	**W Diamond Ave** From I-270 to Water St	5	1.6	44.4
5	**Frederick Rd** From Middlebrook Rd to Wheatfield Dr	13	2.3	18.8
6	**Frederick Rd** From Gude Dr to Shady Grove Rd	15	1.9	11.9
7	**Ridge Rd** From Frederick Rd to Brink Rd	9	3.3	28.6
8	**Muncaster Mill Rd** From ICC (MD-200) to Olde Mill Run	10	1.5	24.7
9	**Georgia Ave** From Forest Glen Rd to Plyers Mill Rd	14	2.7	12.5
10	**Connecticut Ave*** From Matthew Henson Trail to Georgia Ave	11	2.4	18.0

*Roadway overlaps with High Incidence Area for Pedestrian Safety Initiative

**VMT = Vehicle Miles Traveled

SHARED MISSION, SHARED ACCOUNTABILITY

Continuous Collaboration

The final piece of the puzzle is to ensure accountability for this Action Plan in an open, constructive, and continuous process. The County Executive's Vision Zero Steering Committee will continue to regularly update our collective progress in a manner that allows anyone to access this vital information and provide input.

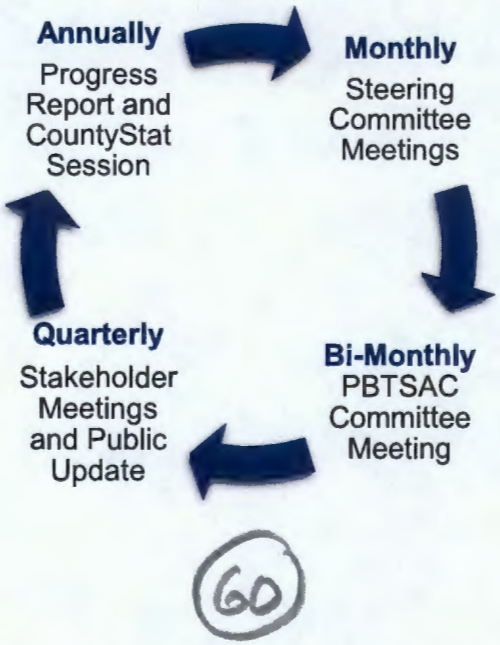
The Steering Committee, which includes representatives of MCDOT, MCPD, PIO, MCFRS, and PBTSAC, will meet monthly to oversee progress of the 2020 Action Plan. Public agencies and community stakeholders, many of whom are responsible for elements of the Action Plan, will meet quarterly to review progress and discuss issues regarding implementation.

Accountability

The Steering Committee, with the help of the stakeholders, will produce an annual progress report, participate in a yearly CountyStat accountability session, and oversee development of the Ten-Year Strategy. The Steering Committee will coordinate a review of ongoing plans and policy development in the County to ensure concurrency with Vision Zero goals and objectives. The annual CountyStat session will track how well the County's efforts are affecting roadway safety by analyzing the relevant data, track the status of all action items, and assign corrective follow-up items as needed.

By tracking progress and determining what works, the County will build a strong base for developing a long-term Ten-Year Strategy to eliminating severe and fatal collisions in Montgomery County by 2030

Annual Update Cycle



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APPENDIX A – CRASH DATA SOURCES

The data presented in this plan does not include every serious and fatal collision that occurred in the County during the analysis period. The main areas excluded are the interstates, I-495 and I-270, and the City of Takoma Park. These areas were omitted for two reasons. First, MCPD's records did not include reports from the departments listed in the right column in the table below going back to 2012. Second, this action plan is designed to focus on areas where the County Government can best use its resources on roadways it maintains and can perform enforcement.

During 2018 and 2019, Montgomery County Government started a data sharing agreement with M-NCPPC Park Police and Takoma Park Police to store their data on Montgomery County Police's servers and publish their crash reports on dataMontgomery. For the 10-Year Vision Zero Strategy, all available departments will be included for analysis and setting interim targets.

Reports Included	Reports Not Included
Montgomery County PD	MD State Police
Rockville PD	MD Transit Authority
Gaithersburg PD	Takoma Park
	M-NCPPC Park Police
	Chevy Chase Police

APPENDIX B –TWO-YEAR PLAN ACTION ITEMS STATUS AS OF 12/2019

Action Item	Due Date	Status	Notes
ENG-1 Identify HINs for Modification	Identify priority HIN projects by **1/31/2018**	Complete	Identified High Injury Network. Identified initial list of potential engineering options. Met with SHA to review SHA HIN projects along Georgia Ave and Veirs Mill Rd, among others. Some SHA HINs have already received updates, others are in design.
ENG-2 Road Design Standards	Publish revised road designs by **11/1/2019**	Behind Schedule, In Progress	MCDOT and M-NCPPC are advancing on this action item together under joint funding. MCDOT is also updating its existing lighting, signing, marking, and signals standards. The next public feedback session will be announced in spring 2020 and substantial completion in spring 2020 and Council approval by summer 2020.
ENG-3 Road Safety Audits	Implement new process by **11/1/2018**	Complete	MCDOT added a preconstruction RSA activity to its design process.
ENG-4 Review Transit Stops	Develop program review requirements by **5/1/2018**	Complete	MCDOT identified 265 bus stops to be reviewed and potentially modified. MCDOT completed Middlebrook & MD 355 bus stop audits. MCDOT performed two additional bus stop audits in November 2018 for Wheaton CBD and Randolph Road.
ENG-5 Trail Crossings	Develop list of priority trail crossings and intersections for modification by **11/1/2018**	Complete	Parks improved 18 mid-block crossings. MCDOT continues to coordinate with M-NCPPC on crossings for Rock Creek Trail, Diabase Trail, Hoyles Mill Trail, Muddy Branch Greenway Trail, Northwest Branch Trail, Upper Rock Creek Trail, Cabin John Trail, and more. MCDOT has conducted and reviewed speed studies and crossing plans. For 2020, Parks is assessing another 15 hard and natural surface trail crossings, including along Ten Mile Creek Trail, Black Hills Trail, and others.

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Action Item	Due Date	Status	Notes
ENG-6 **Collaboration w State**	Identify potential project areas by **1/1/18**	Complete	SHA and MCDOT are prioritizing work on MD-97 (Georgia Ave) and MD-586 (Veirs Mill Rd) to develop short- and long-term solutions for pedestrian safety. SHA and MCDOT are jointly investigating and implementing safety improvements along MD 97 including curb markings, sidewalk stamps, speed limit reduction, non-traversable median, lighting improvements, signal installations, HAWK signal, RRFB signal, and lane narrowing. SHA Administrator Greg Slater has promised increased focus on pedestrian safety by his agency to include lowering speed limits to 30 MPH or lower in all central business districts and improving pedestrian crossings. Changes by SHA to MD-97 detailed at https://www.roads.maryland.gov/pages/release.aspx?newsId=3350
ENG-7 **Ped Signals**	All pedestrian signals retimed to 3.5 feet/second by **November 2019**	Complete	MCDOT reset the crossing time at each of the County's pedestrian signals to a 3.5 ft/sec standard. MCDOT installed 3 HAWK beacons at Muddy Branch Rd & Harmony Hall Rd and Aspen Hill Rd & Northgate Shopping Center, and Tuckerman Ln & Bethesda Trolley Trail. Installation has been approved for 4 in 2020 (Democracy Blvd & Walter Johnson HS, Willard Ave & The Hills Plaza, Summit Ave and Brookfield Dr, and upgrade the RRFBs on Bel Pre Rd). An additional pedestrian signal at Randolph Road and Livingston Street was turned into a full signal. MCDOT has also installed rectangular rapid flashing beacons and standard flashing beacons at trail crossings and low traffic volume roads.

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Action Item	Due Date	Status	Notes
ENG-8 **Accelerate Sidewalk Building**	Publish list of high priority areas lacking sidewalks by **4/1/18**	Complete	In addition to the gap analysis required in the Two-Year Plan, MCDOT gathered data to evaluate ADA ramp provision and other impediments to sidewalk travel.
ENG-9 **Bicycle Network**	On-going effort	On-going	Construction of Second/Wayne Ave Cycletrack in Silver Spring was completed in early Oct 2019. Design and public outreach for remaining Silver Spring loop cycletracks and protected parking facilities occurred throughout 2019. Construction of the Executive Blvd cycletrack in White Flint was completed in December 2019. Design for the Bethesda loop was completed with multiple facilities with notice to proceed anticipated for spring 2020. Design on the Aspen Hill Neighborhood Greenway and the Amherst Ave protected bike project began in 2019. County Council approved the updated Bicycle Master Plan on 11/27/18. MCDOT has developed a website, video, and brochure about how to use these new facilities at montgomerycountymd.gov/lookout
ENF-1 **Fatal Crash Review Team**	Establish team and hold first meeting by **12/15/17**	Behind Schedule, In Progress	County staff participated in the Maryland Highway Safety Office's (MHSO) pedestrian fatal crash review team with the Montgomery County meetings on March 28 and May 31, 2019. The MHSO reviewed all fatal pedestrian crashes during 2016. For the County team, MCPD and CountyStat have developed meeting framework,

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Action Item	Due Date	Status	Notes
			team roster, and team goals. Once non-disclosure agreement is finalized by the County Attorney's Office, first session can be held.
ENF-2 Enforcement Activity	On-going effort	On-going	MCPD conducted high visibility enforcements year-round for curbing dangerous behaviors such as violating pedestrian right-of-way, speeding, distracted driving, aggressive and impaired driving. From FY18 to FY19, MCPD increased pedestrian safety enforcement details from 294 to 401.
ENF-3 Automated Enforcement	On-going effort	On-going	Request for Proposals have been sent out for new automated (red-light and speed) enforcement contract. The RFP sets up for the expansion of the program. RFP available at https://www.montgomerycountymd.gov/PRO/Resources/Files/Solicitations/1081683.pdf
ENF-4 Unmarked Cars	Purchase and use more unmarked cars by **12/1/18**	Behind Schedule, Not Started	Issuance of unmarked vehicles is a subject of bargaining and must be negotiated with Union prior to implementation. This action item will be reconsidered during the 10-year strategy.
ENF-5 Collaboration w/ Courts	Complete initial outreach by **5/1/18**	Complete	A public-private education campaign called "Noah on Patrol" was released on May 23, 2018. As part of "Noah on Patrol," a court watch program will monitor impaired driving cases in the county. The State's Attorney Office pushes for ignition interlocks in impairment cases.
EDU-1 Comprehensive Strategy	Publish Strategy by **5/1/18**	Complete	The Public Information Office completed the 2019 strategy and the Steering Committee has committed resources to the plan. The plan was finalized on October 24, 2018.
EDU-2 Expand SRTS	Expand SRTS by start of **2019-2020 school year**	On Schedule	Walk to School Day events were held on Wednesday, Oct 2. http://www.walkbiketoschool.org/ The Safe Routes to School coordinator position was filled in early Sept 2019.

Action Item	Due Date	Status	Notes
			The Vision Zero Youth Ambassador Summit was October 21 at Glenmont Local Park. MCDOT tasked two different consultants with additional Safe Routes to School Walk Audits in fall 2018. MCDOT and MCPS are coordinating together on Safe Routes to School programs.
EDU-3 **On-bike Education**	Agreement with MCPS by **19-20 school year**	Behind Schedule, In Progress	MCPS, MC Rec Dept, and MCDOT are coordinating together on this action item. A pilot program kicked off in April 2019 at Oak View ES in Silver Spring and continues to sponsor bicycle rodeos in schools, but no agreement has been reached for Countywide education in the schools. MCDOT has continued to host bike rodeos to teach safe biking practices to kids at different schools throughout the County. MCDOT did not win grant funding for a permanent Safety Garden to be installed in the County, but is researching other funding options.
EDU-4 **Grant Program**	Solicit proposals by 6/1/2018	No Resources	Due to budget constraints, the FY20 approved budget does not fund this item.
EDU-5 **County Employee Safety Campaigns**	Complete first round of awareness trainings by **11/1/2018**	Complete	Developed targeted material for key departments and divisions as well as industry safety information. Held a focus group of County employees from 9 different departments to assess new distracted driving campaign on 4/24 and pop-up events in Wheaton on 5/4 and 7/27 in Rockville. MCDOT held refresher training for pedestrian safety for all Ride On bus operators.
EDU-6 **Team Building**	Hold at least two collaboration events by **11/1/2018**	Complete	MCDOT, MCFRS, MCPD, MCPS, PIO, and CEX staff have partnered in the fall "Be Safe, Be Seen" pedestrian safety outreach campaign.

Action Item	Due Date	Status	Notes
			Scheduled a job shadowing opportunity for police and DOT employees occurring over winter 2019-2020. MCPD will also have officers trained on roadway engineering practices from UMD.
EDU-7 Sleep & Safety	Complete first round of awareness trainings by **11/1/2018**	Complete	Drowsy driving messages have been sent to shift work employees as part of their safety meetings.
EDU-8 Future Tech	1st Report by **12/31/2018**	Behind Schedule, Not Started	This item will be reevaluated during the creation of the 10-year Vision Zero strategy. MCDOT and other experts presented to the County Council on September 26, 2017 about the future of autonomous vehicles in Montgomery County. Video of session is at: http://montgomerycountymd.granicus.com/MediaPlayer.php?view_id=169&clip_id=13823&meta_id=143448 The County has also granted permission for an autonomous shuttle to operate on a County road.
EDU-9 Community Partners	**12/1/2018**	Complete	Developed targeted distracted driving safety material for using with County employees and the public. Held a focus group of County employees from 9 different departments to assess new distracted driving campaign on 4/24 and pop-up events in Wheaton on 5/4 and 7/27 in Rockville. Currently using materials developed by Public Information Office, MHSO, Council of Governments and NHTSA on buses and social media. Throughout the Vision Zero Two-Year Action Plan, MCDOT, MCPD, MCFRS, and County Executive staff presented about Vision Zero throughout the County to community groups, parent teacher associations, transportation management district advisory committees, etc. and utilized on-street campaigns to reach more County residents.

Action Item	Due Date	Status	Notes
TIM-1 Emergency Services	On-going effort	Complete	FRS and CountyStat monitor response times for emergency medical service calls.
TIM-2 TIM Plan	Create plan by **11/1/2018**	Complete	Framework finalized for a joint MCFRS and MCPD traffic incident management plan. During 2020, the departments will use the framework to update and sync standards.
TIM-3 Police Driver Training	Improve driver training by **11/1/2019**	Complete	Improving driver training is a strategy for MCPD's Turn the Curve Plan for reducing the number of at-fault vehicle crashes.
TIM-4 Temporary Traffic Control Devices	Procure traffic control devices for a pilot program by **11/1/2018**	No Resources	Due to budget constraints, the FY20 approved budget did not fund this item.
LPA-1 Law & Policy Change	Identify changes needed by 12/1/2017	Complete	County elected officials, MCDOT, and MCPD have testified in Annapolis to support bills enhancing pedestrian safety, reducing impaired driving, and bringing Vision Zero to the State. Full list of accomplishments available at https://www.montgomerycountymd.gov/OIR/Resources/Files/2019/Accomplishments_2019.pdf
LPA-2 Equity Task Force	Establish task force by **12/31/17**	Complete	Five meetings were held where the task force reviewed the County's engineering, education, and enforcement efforts. Final comments from the task force on the report have been processed with a final version released in December. All meeting materials and final report can be found at https://www.montgomerycountymd.gov/visionzero/equity.html

Action Item	Due Date	Status	Notes
LPA-3 **VZ Manager**	Appoint interim manager 11/17 with full-time coordinator by **1/31/18**	Behind Schedule, In Progress	CountyStat provided interim support for Vision Zero coordination in 2018 and 2019. The Request for Proposal (RFP) for a Vision Zero coordinator was released by Procurement on May 16, 2019 with a deadline for responses of June 14. Bids received did not score high enough to move forward with a contract. County Executive then approved moving forward with a full-time, merit position for the coordinator. The job advertisement was released November 14, 2019 with a target of having the position filled in February 2020.
LPA-4 **VZ Website**	Have full page build-out by **11/30/17**	Complete	PIO led a revamp of the Vision Zero homepage to provide links to events and partner websites. New homepage was launched on 6/30.
LPA-5 **VZ Feedback Map**	Publish map by **11/30/17**	Complete	App was launched with redesigned website in late September 2018 on the Vision Zero website.
LPA-6 **Ped Master Plan**	Complete master plan by **11/1/2019**	Behind Schedule, In Progress	The scope of work for the Pedestrian Master Plan was approved by the Planning Board in September 2019 with the plan due to be completed and approved in summer 2021. Public meetings sponsored by the Planning Department to kick-off the plan will be held in September and October. More at https://montgomeryplanning.org/planning/transportation/pedestrian-planning/pedestrian-master-plan/
LPA-7 **Public Crash Data**	Publish by **11/1/17**	Complete	All 3 tables are published and updating weekly. MCPD added new fields to existing tables in May 2019 to provide more location data.
LPA-8	Start outreach by **11/30/17**	Complete	MCPD implemented training to address proper report writing within the academy classes as well as to audit reports for data entry

Action Item	Due Date	Status	Notes
Improve Crash Data Collection			errors. Maryland State Police made some fields within the ACRS reports mandatory and some fields mandatory on dependencies to help in capturing all the relevant data per event.
LPA-9 Peer Collaboration	Start outreach by **12/1/17**	Complete	Montgomery County is a member of the Road to Zero coalition, works with the State as participants in Zero Deaths MD workgroups, and working with regional vision zero cohort.
LPA-10 Review Safety Programs	Release results by **11/1/2018**	Complete	Reviewed safety programs in conjunction with Equity Task Force work. Task force recommended changes in practice and project prioritization that could lead to better resource allocation.
LPA-11 Municipalities	Complete initial outreach by **1/1/18**	Complete	The County is working with Rockville and Takoma Park to discuss how the County can help build their Vision Zero plans. Continued outreach efforts will be conducted by the Vision Zero Coordinator.
LPA-12 Research Partners	Reach out to potential research partners by **1/1/18**	Complete	The County does not have funds to pay for research, but is open to participating or being a living laboratory for researchers. The County will reach out to local partners to gauge interest.
LPA-13 Vehicle Procurement	Finalize policy by **11/1/2018**	Behind Schedule, Not Started	This action item has been moved to 2020. Discussions with PRO and DGS-Fleet Management will start once the Vision Zero Coordinator position is filled.
LPA-14 10-Year Plan	Start feedback sessions in **January 2019**, complete by **November 2019**	Behind Schedule, Not Started	The one-year 2020 Action Plan was released in January 2020 to bridge activities between the2018-2019 Two-Year Plan and the Ten-Year Plan. Public outreach for building the long-term plan will start in spring 2020.

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