#### Maryland's Vulnerable Road User Safety Assessment





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# **Outline of Today's Meeting**

#### Introductory presentation

- The purpose of the Vulnerable Road User (VRU) Safety Assessment
- SHA's recently completed Pedestrian Safety Action Plan (PSAP)
- Key differences between the PSAP and the VRU Safety Assessment
- High-risk areas for walking and cycling in Maryland
- Next steps for the VRU Safety Assessment

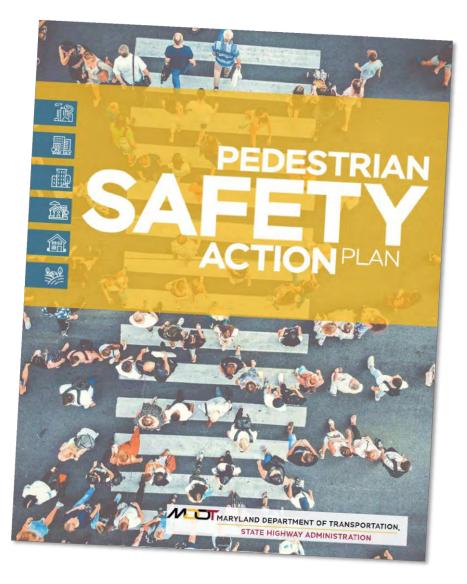
### Purpose of the VRU Assessment

- A "vulnerable road user" (VRU) is someone who is walking, cycling, or rolling.
  - For FHWA's purposes, motorcyclists are NOT considered VRUs.
  - Vulnerable road users are particularly susceptible to being killed or injured in a crash, and they account for a growing share of all transportation fatalities, both in Maryland and throughout the United States.
- Evaluate the state's safety performance for pedestrians and cyclists.
- Develop a plan to improve safety for these travelers.

of h Fede	Napartment 2015portation real Highway Unistration	Memorandum
Subject	ACTION: Vulnerable Road User Safer Assessment Guidance (Due date: November 15, 2023)	ty Date: October 21, 2022
From	Cheryl J. Walker Chuldhand Associate Administrator, Office of Safet	y In Reply Refer To: HSSP
To	Division Administrators	
User Sa accordan This gui (FHWA) dated De Except fo and effec	Antoan Infrastructure Law" (BIL)) All Str ferly Assessment as part of their Highway 5 nee with 23 U.S.C. [48(1)] dance also incorporates principles consiste <u>Policy on Hsing htpartison Infrastructure</u> cember 16, 2021. <i>w the stanutes and regulations cited, the col-</i>	sekground and guidance to clarify the Assessment as described in 23 U.S.C. 148(1), fobs Act (IIJA) (Pub. L. 117-58, also known as ates are required to develop a Vulnerable Road Safety Improvement Program (HSIP) in mt with the Federal Highway Administration's <i>Law Resources to Initid a Better America</i> , untents of this document do not have the force es or the public in any way. This document is ding requirements under the law or agency.

### Purpose of the VRU Assessment

The VRU Safety Assessment will build on the Pedestrian Safety Action Plan that was completed recently.





# OUTFRAMEWORK:

# Driven

### OUT FRAMEWORK



SHOW where these strategies have worked

Case Studies

omex

INVEST in people •••••• Training

## Guide

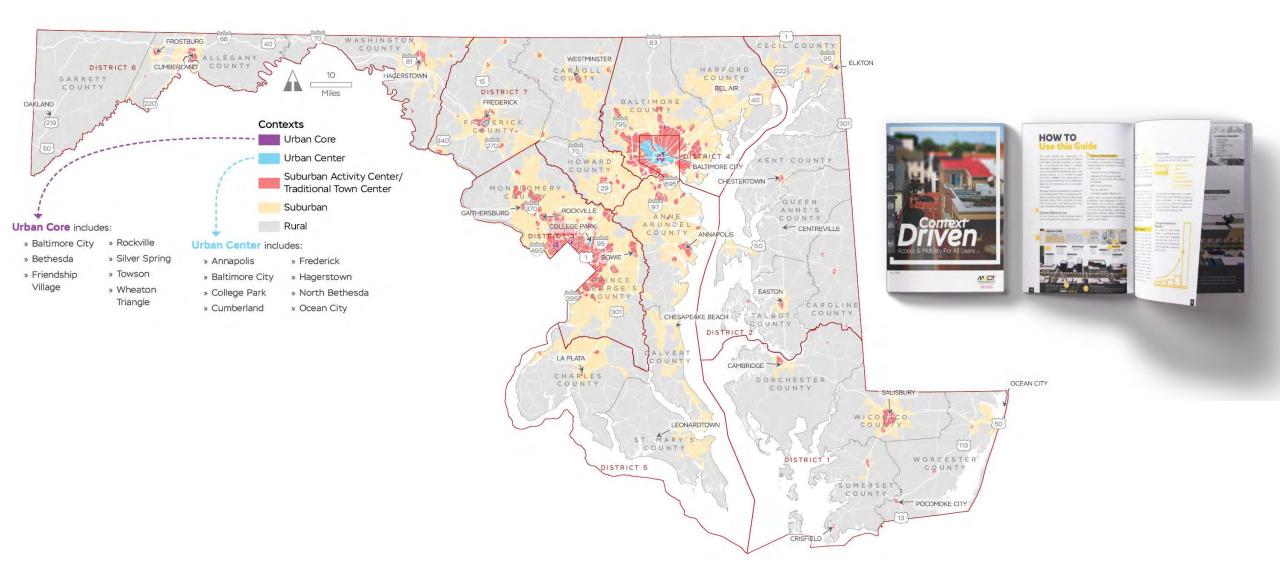




SHA's contexts recognize a more nuanced gradient of land uses that can better inform transportation projects in Maryland.

## Guide





## Toolkit





#### Context Zones

Which Context Zones the countermeasure applies to (darker shade = applicable).



Definition and Description An in-depth explanation of the countermeasure.

C

Considerations Special considerations to pay attention to when implementing.



Examples Photos of the countermeasure as applied.

Complimentary Countermeasures Other countermeasures that this countermeasure is often paired with to enhance safety outcomes.



#### Applications

Where and how a countermeasure is typically applied to a street or road design.



#### References

Lists state/national guidance and standards that were consulted in formulating the countermeasure.





# SHA'S PEDESTRIAN SAFETY ACTION PLAN

#### What is a pedestrian SAFETY ACTION PLAN



#### EVERYONE IS A PEDESTRIAN!

Even if you drive for most of your trips, everyone is a pedestrian at some point, even if that is just walking from your parked car to your destination.

SHA decided to develop the PSAP to answer the question:

"Where and how can we address vulnerable user needs across the SHA transportation system?"



#### What is a pedestrian SAFETY ACTION PLAN



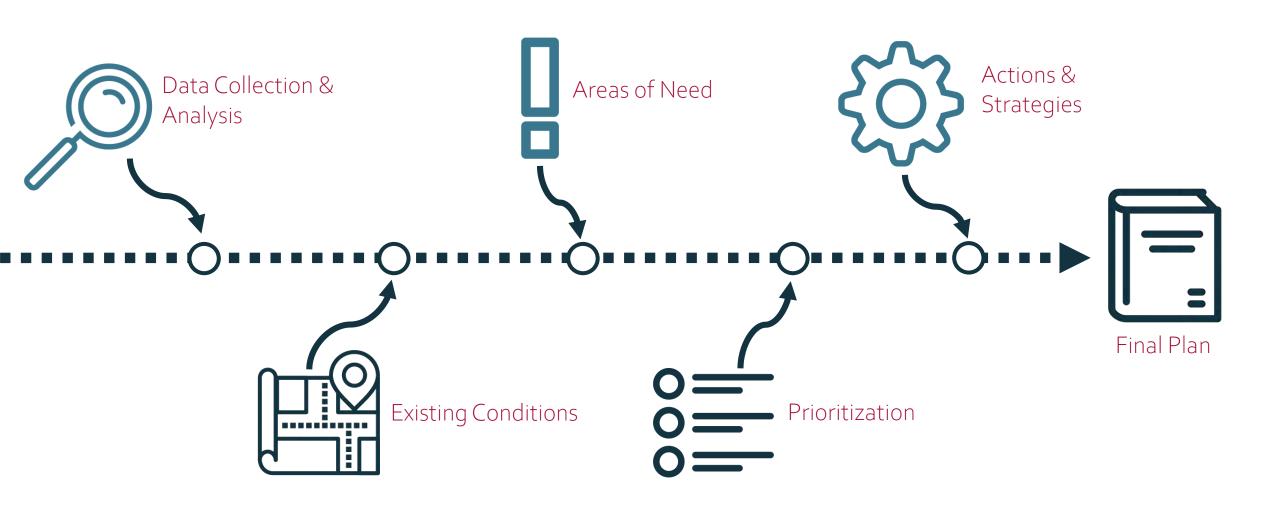
The PSAP also advances Maryland Strategic Highway Safety Plan goals:

- Address the <u>4 Es</u>: Enforcement, Engineering, Education, Emergency Medical Services.
- Consider land use context in the way we design roads.
- Differentiate between mobility and access.
- Prioritize roadway design projects that will enhance safety for all Marylanders (pedestrians, bicyclists, drivers, transit users).



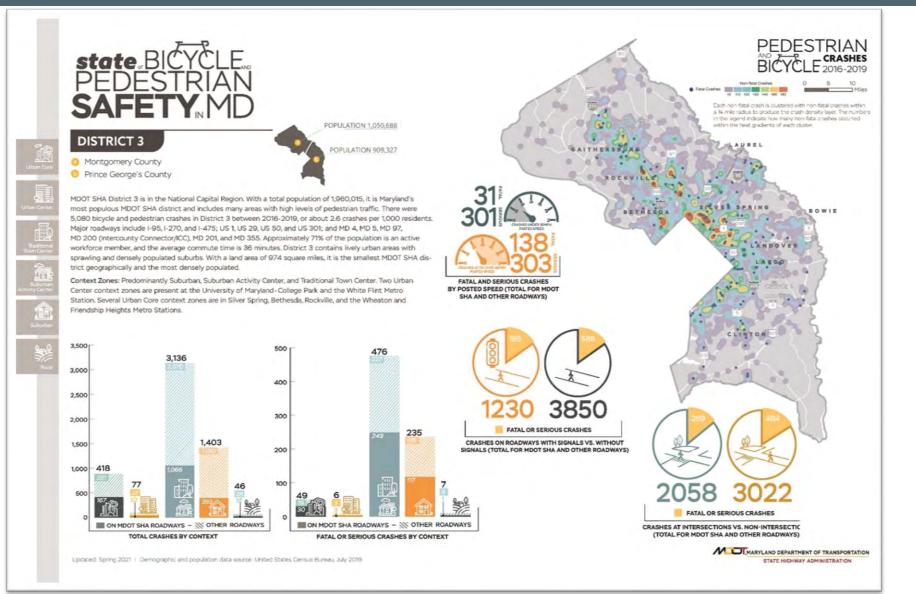
## What ARETHESTEPS





## **Existing** conditions





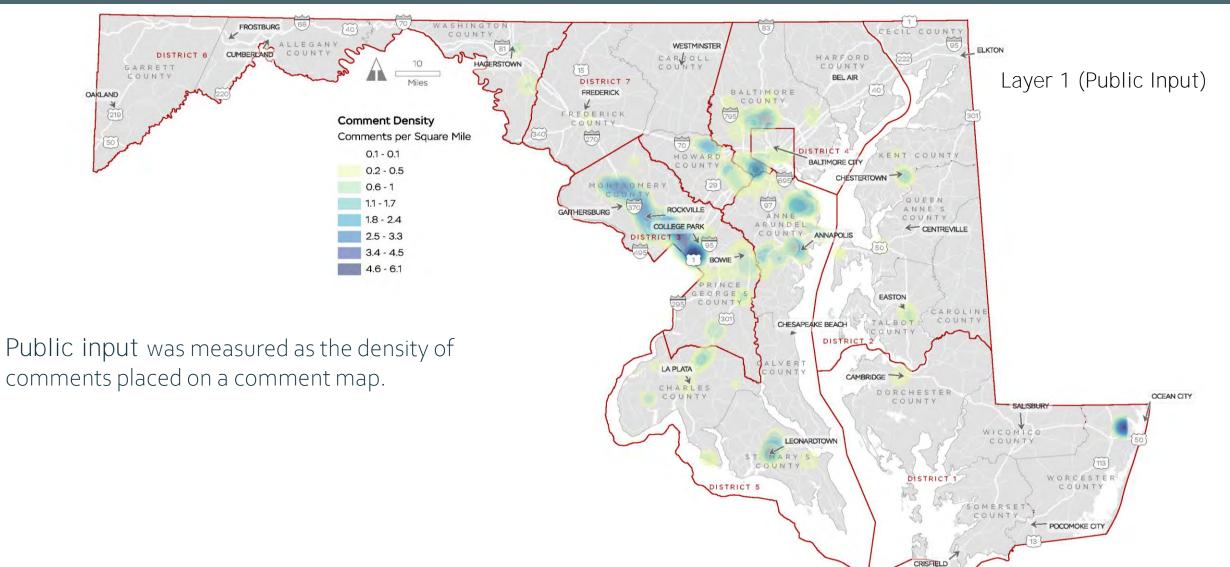


Areas of Need are broad geographic areas that have the highest need for non-motorized safety improvements based on:

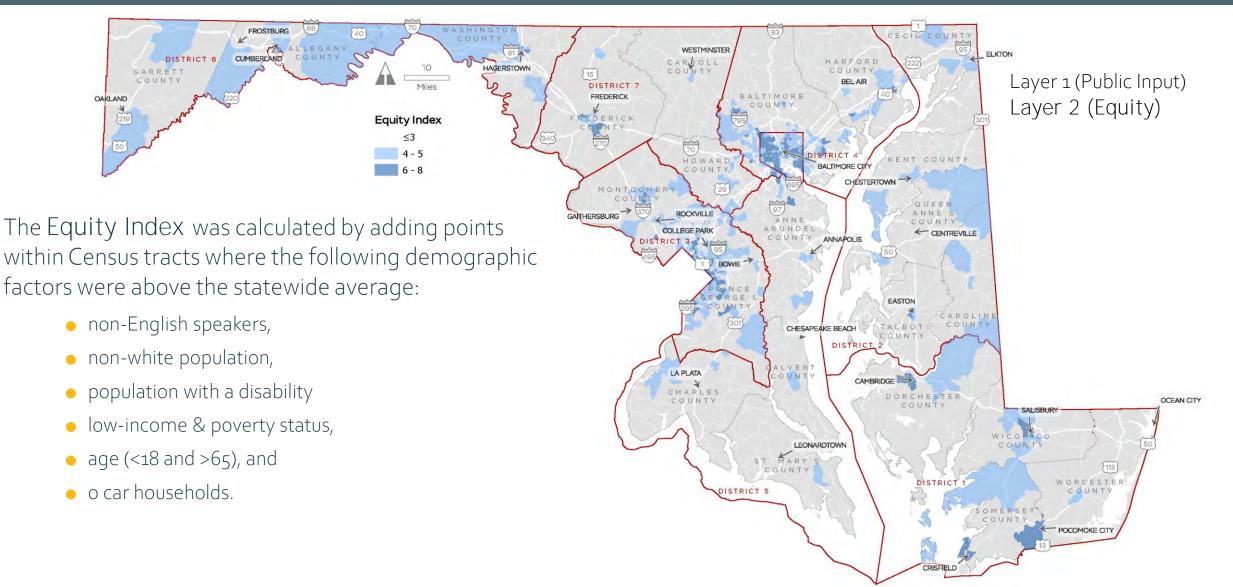
- public input,
- equity,
- non-fatal pedestrian and bicycle crash density,
- fatal and serious pedestrian and bicycle crash density, and
- Short Trip Opportunity Areas.

Within the identified areas of need, specific roadways were identified as candidates for safety improvements through the Prioritization process.



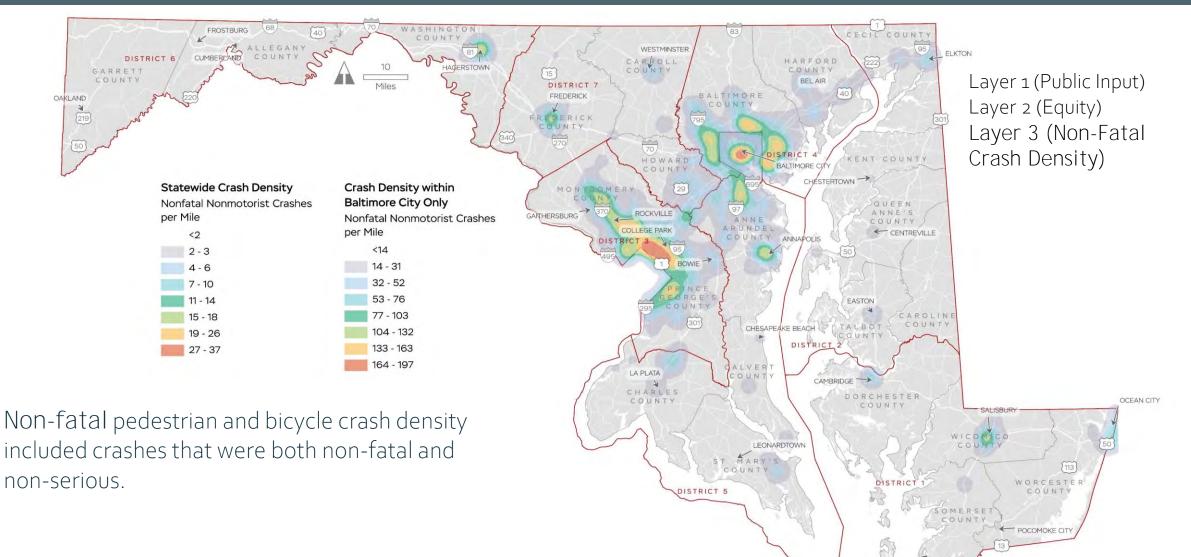






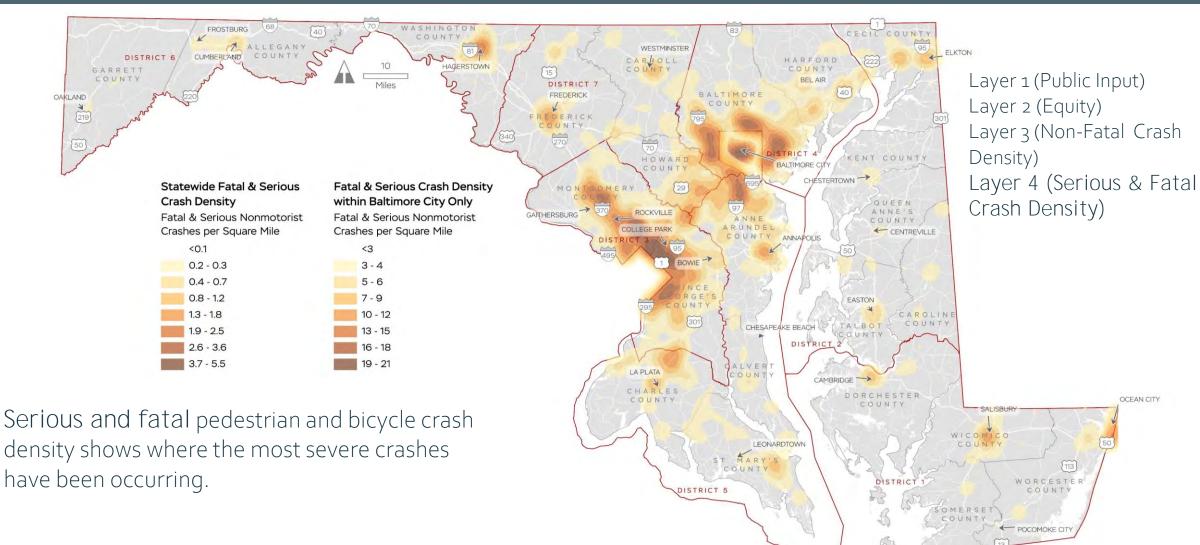


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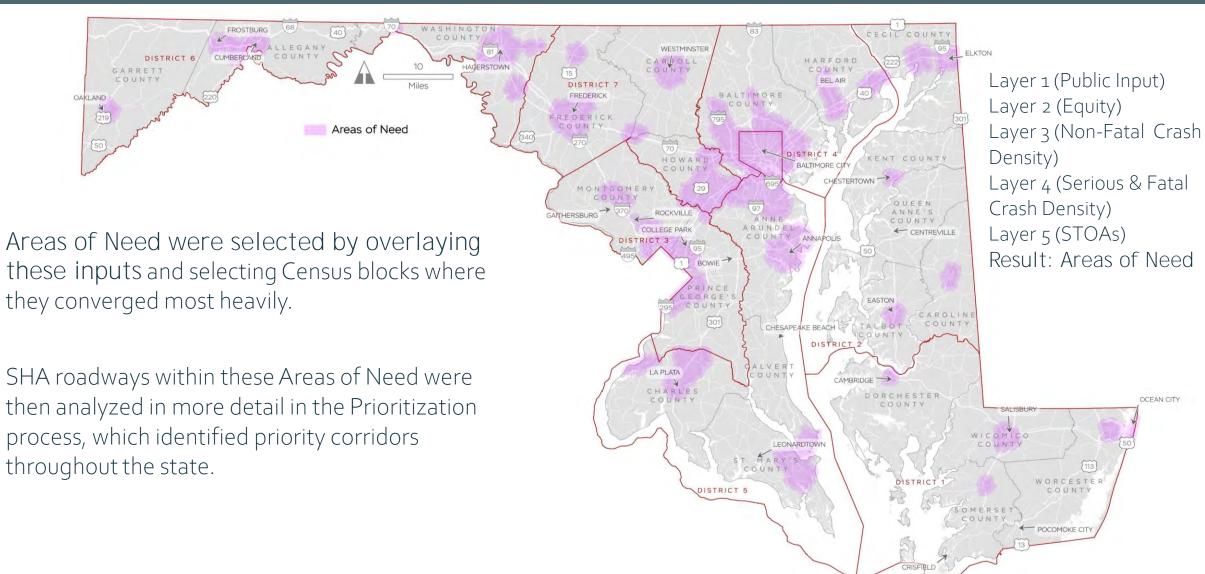
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FROSTBURG WASHINGTO (83) CECIL COUNTY K COUNTY (95) CUMBERLAND COUNTY (81) WESTMINSTER ELKTON DISTRICT 6 CARBOLL HARFORD HAGERSTOWN GARRETT COUNTY 15 Layer 1 (Public Input) COUNTY BEL AIR DISTRICT 7 Miles FREDERICK BALTIMORE OAKLAND Layer 2 (Equity) COUNTY Short Trip Opportunity Areas 219 REDERICK (Score 3-5) OUNTY Layer 3 (Non-Fatal Crash 270) (70) ISTRICT Density) HOWARD KENT COUNTY BALTIMORE CITY COUNTY CHESTERTOWN -> Layer 4 (Serious & Fatal 29 MONTGOMERY GATHERSBURG - 370 97 QUEEN Crash Density) ANNES ROCKVILLE ANNE COUNTY Short Trip Opportunity Areas (STOAs) are places where ARUNDEL COLLEGE PARK Layer 5 (STOAs) <-- CENTREVILLE COUNTY ANNAPOLIS DISTRICT 3 ¥ (95) there are opportunities for high numbers of short car trips BOWIE -> to be replaced by walking and biking trips. They were RINCE ORGE EASTON OUNTY identified based on: CAROLIN (301) COUNT TALBOT CHESAPEAKE BEACH DISTRICT. employment densities (25% weight), ALVER LA PLATA OUNTY CAMBRIDGE CHARLES population densities (25% weight), DORCHESTER COUNTY OCEAN CITY COUNTY SALISBURY school coverage (20% weight), WICOMICO LEONARDTOWN COUNT • transit coverage (20% weight), and MARY COUNTY WORCESTER DISTRICT 1 • o car households (10% weight). DISTRICT 5 COUNTY SOMERSET COUNTY POCOMOKE CITY CRISFIELD





# **Priority** corridors



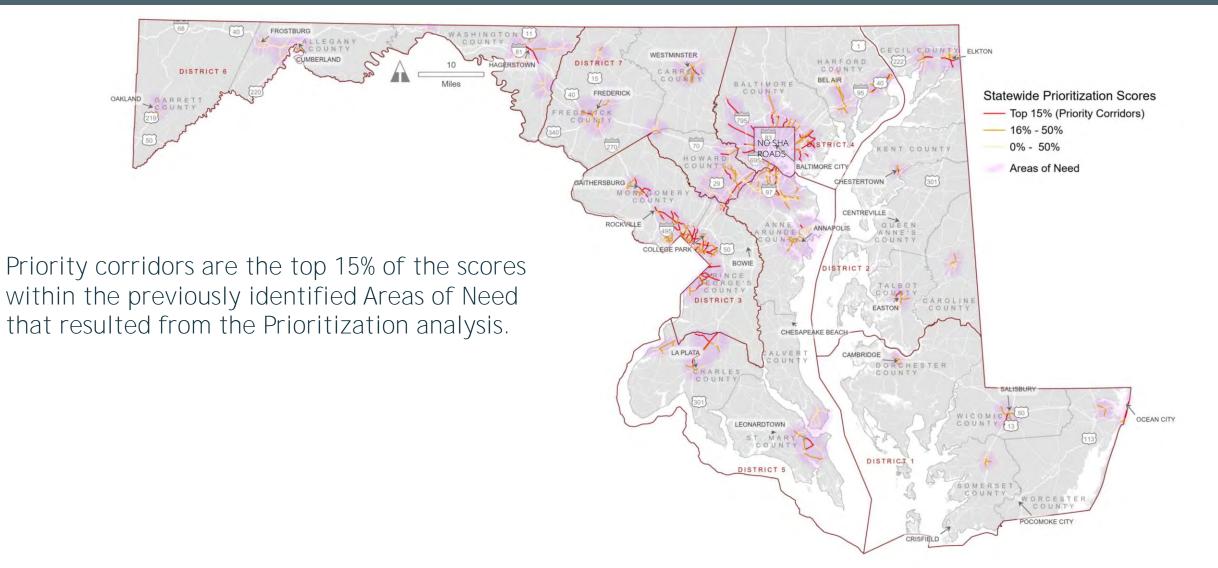
Priority corridors were selected within the Areas of Need through the prioritization analysis. This involved weighted scoring of each SHA roadway within each Area of Need using the following factors:

- fatal non-motorized crashes per mile (above average),
- serious non-motorized crashes per mile (above average),
- other non-motorized crashes per mile (above average),
- Equity Index score,
- Short Trip Opportunity Areas,
- Highway Safety Improvement Program (HSIP) data,
- one-half mile rail transit walksheds,
- bus stop density (above average),
- SHA Bike Spine, and
- schools.



# **Priority** corridors









#### COORDINATE with local agencies and jurisdictions

INVEST in communities

MEASURE outcomes to evaluate effectiveness of countermeasures

#### **RESEARCH and MONITOR**

new and evolving tools, standards, and technologies

#### UPDATE and REVIEW data methodologies and tools

TRAIN SHA and other staff

**INNOVATE** to stay at the forefront of industry best practices and technology

MAINTAIN infrastructure investments

REVIEW projects and policies for pedestrian safety

EDUCATE the public

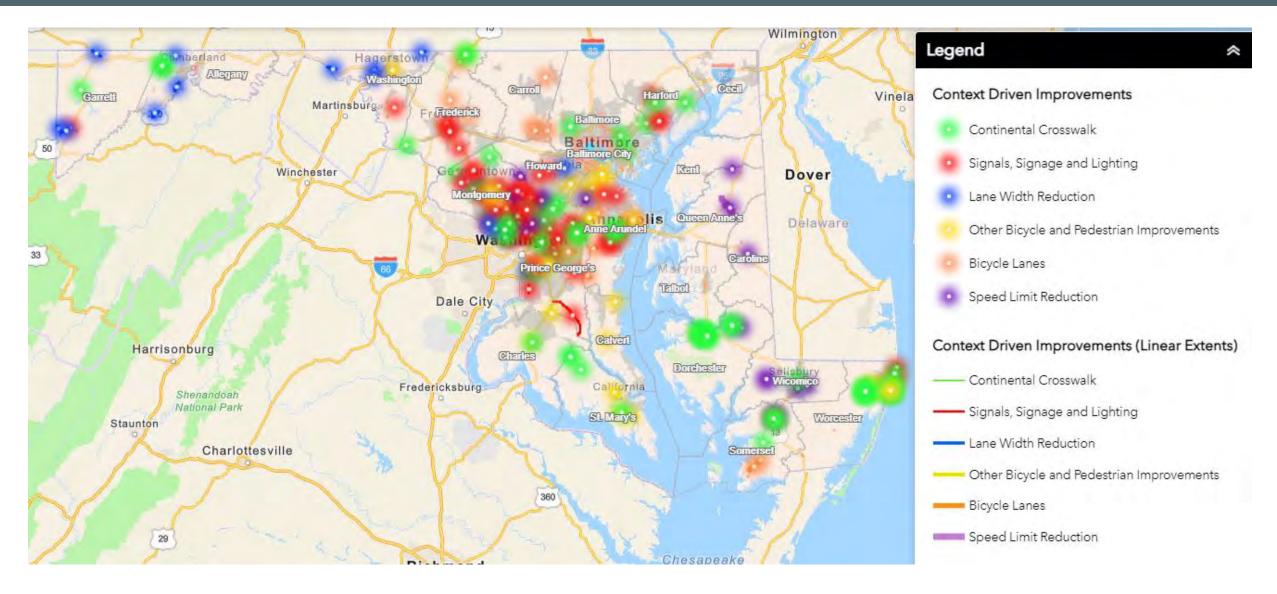


More than 300 context-driven bicycle and pedestrian safety projects throughout the state have been completed during the PSAP development process, beginning in 2019.

The PSAP will continue to help SHA district offices identify where the need for pedestrian and bicycle safety is greatest and provide them with the guidance to develop projects.









SHA has programmed \$75 million for pedestrian safety improvements and is actively developing projects to begin design activities for the top-scoring corridors.



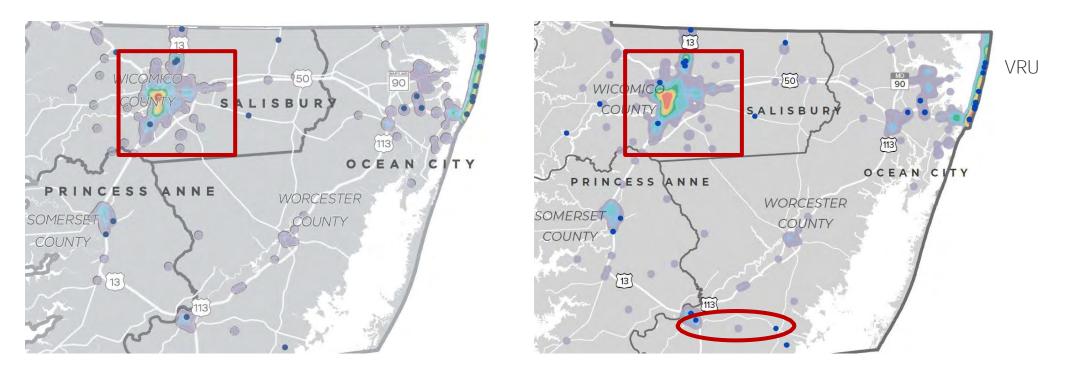
The Federal VRU guidance was released in October 2022, as SHA was completing the PSAP.

Although the PSAP contains most of the information needed for the VRU Safety Assessment, there are three key differences.

#### DCVD

Federal VRU guidance requires at least five years of data.

- The PSAP, developed before the Federal guidance was published, used four years of data (2016-2019).
- The VRU Safety Assessment uses six years of data (2016-2021).



PSAP

In the VRU Safety Assessment, **"high**-risk **areas"** (the equivalent of **"priority corridors"** in the PSAP) must include <u>local roads</u>.

- The PSAP included all crashes in the state in the initial analysis, however,
- PSAP priority corridors were limited to state roads.

SHA will provide information on high-risk areas on local roads to the counties or municipalities where those roads are located. Counties and municipalities may use that information when considering road safety projects.

To add to the comprehensive input received during development of the PSAP, **additional consultation** is being held with interested parties throughout the state. This consultation, consisting of virtual meetings and an online survey, would give us more insight into the high-risk areas identified by the assessment.

#### Five virtual meetings were held to cover all parts of Maryland:

- Eastern Shore (Districts 1 and 2): July 11.
- Montgomery and Prince George's counties (District 3): July 13.
- Baltimore and northern suburbs (District 4 and Baltimore City): July 18.
- Southern Maryland and Anne Arundel County (District 5): July 19.
- Western Maryland and Howard County (Districts 6 and 7): July 20.

## Two ways for consultations

#### Consultation meeting

3.

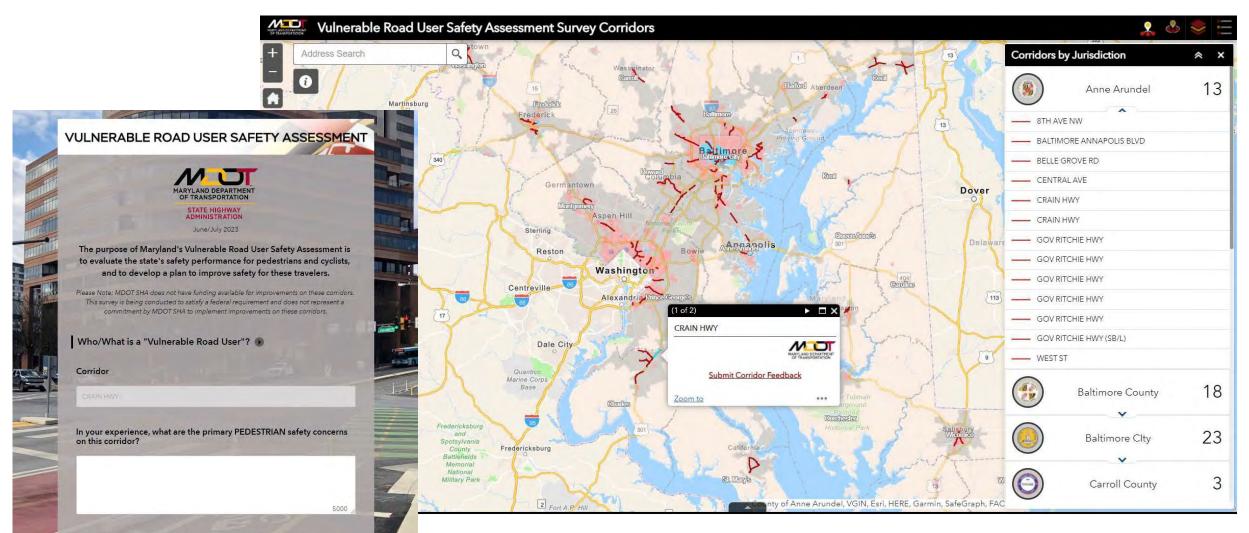
- The audience were asked about three questions:
  - 1. In your experience, what are the primary **pedestrian** safety concerns on this corridor?
  - 2. In your experience, what are the primary <u>cyclist</u> safety
    - concerns on this corridor?
    - What types of improvements would you like to see
    - along the corridor to enhance the safety of pedestrians and cyclists?

## Two ways for consultations

#### Online survey

- Interested parties can select the high-risk areas on which they would like to comment.
- The survey asks the same three questions about each area:
  - 1. In your experience, what are the primary **pedestrian** safety concerns on this corridor?
  - 2. In your experience, what are the primary <u>cyclist</u> safety
    - concerns on this corridor?
  - 3. What types of improvements would you like to see along the corridor to enhance the safety of pedestrians and cyclists?

## **Online Survey Interface**



In your experience, what are the primary CYCLIST safety concerns on this corridor?

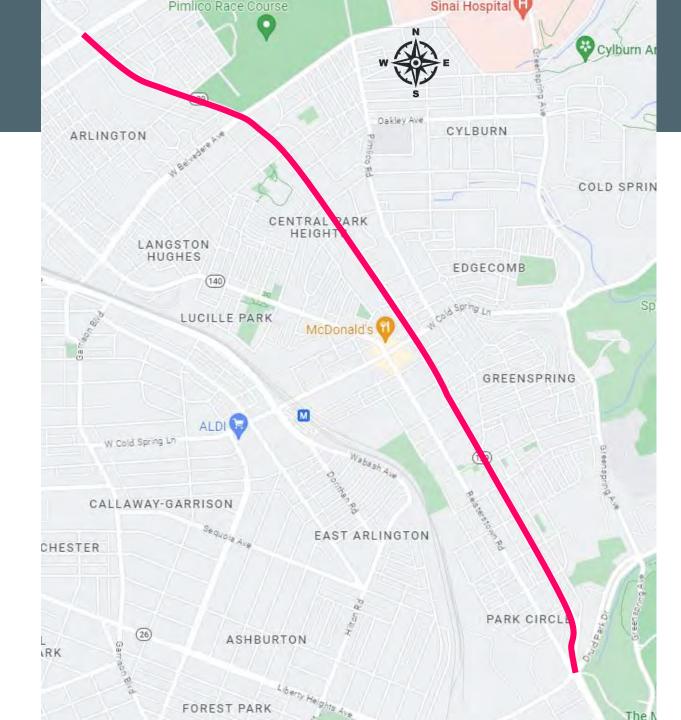
# Baltimore City

#### High-risk areas, Baltimore City

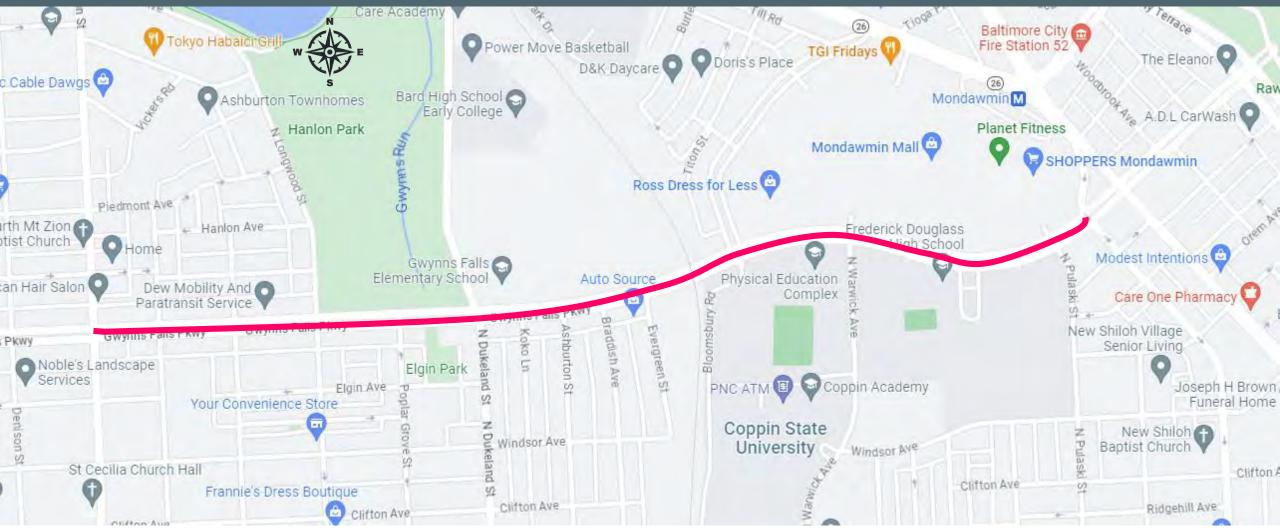
TABLE 4.9: BALTIMORE CITY					
Map ID	Prefix	Route	Name	From	То
1	US	1	North Ave	Falls Rd	St Paul St
2	MU	1370	E Monument St	N Washington St	Edison Hwy
3	US	1	Fulton Ave	Lombard St	US 40
4	MU	100	Patapsco Ave	Washington Blvd	Baltimore Washington Pkwy
5	MU	1281	Washington Blvd	S Monroe St	S MLK Jr Blvd
6	MU	1395	W Lombard St	S Fulton Ave	S MLK Jr Blvd
7	US	40	Franklin St	Poplar Grove St	N Pulaski St
8	MU	6020	MLK Jr Blvd	W Lombard St	N Mulberry St
9	MU	2210	W North Ave	N Hilton St	N Monroe St
10	MD	129	Druid Hill Ave	N MLK Jr Blvd	W North Ave
11	MU	4005	Pennsylvania Ave	N MLK Jr Blvd	W North Ave
12	MU	1900	W Lafayette Ave	N Franklintown Rd	N Monroe St
13	MU	1680	E Fayette St	N Washington St	N Highland Ave
14	MU	1680	E Fayette St	Fallsway	N Wolfe St
15	MU	1920	Edmondson Ave	Poplar Grove St	N Monroe St
16	MU	1920	Edmondson Ave	N Fulton Ave	N Fremont Ave
17	MU	129	Park Heights	Druid Park Dr	W Cold Spring Ln
18	MU	129	Park Heights	W Cold Spring Ln	W Northern Pkwy
19	MU	1023	Gwynns Falls Pkwy	N Hilton St	N Monroe St
20	MU	6020	Park Heights	W Franklin Ave	Druid Hill Ave
21	MD	173	Patapsco Ave	Potee Ave	Fairhaven Ave
22	MD	648	Annapolis Rd	Waterview Ave	Baltimore Washington Pkwy

All streets and highways in Baltimore are maintained by the City.

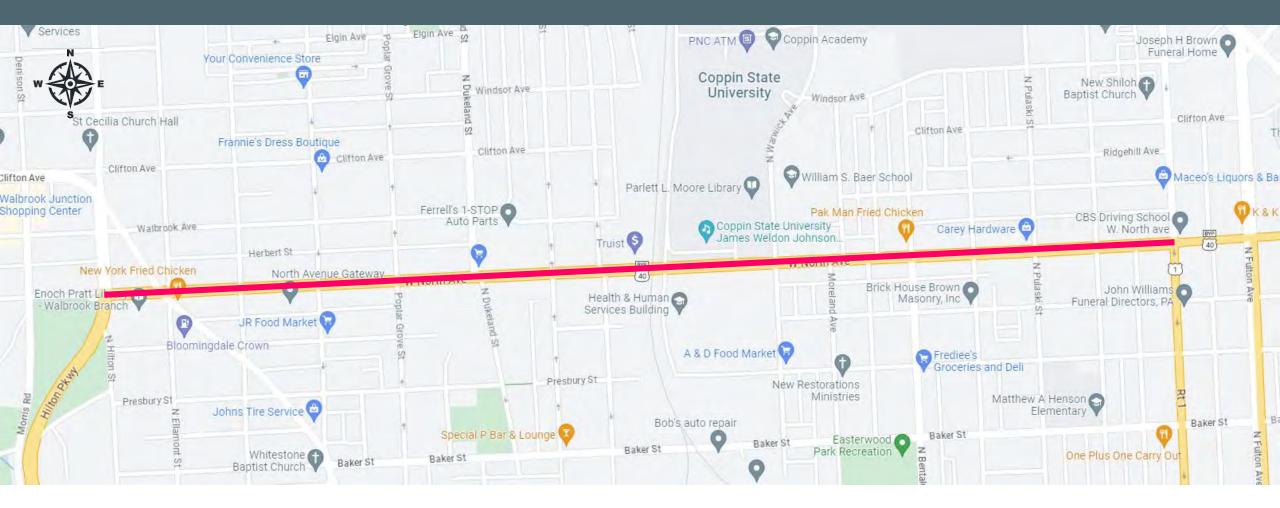


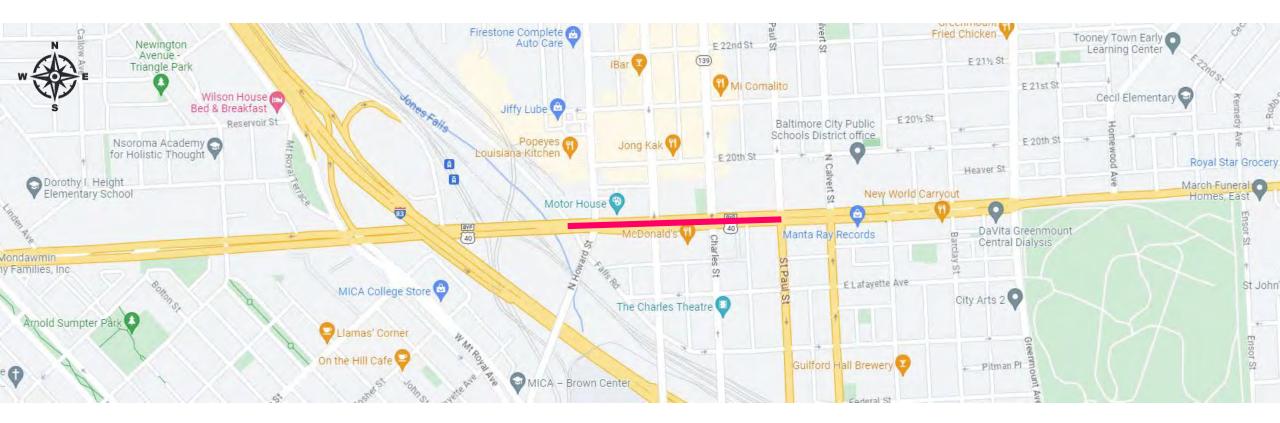


MD 129 Park Heights Avenue from Northern Parkway to Druid Park Drive

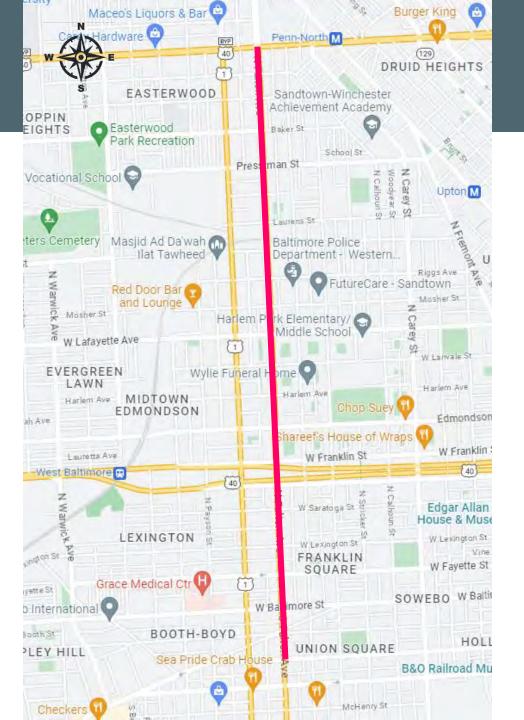


#### <u>Gwynns Falls Parkway</u> from Hilton Street to Monroe Street



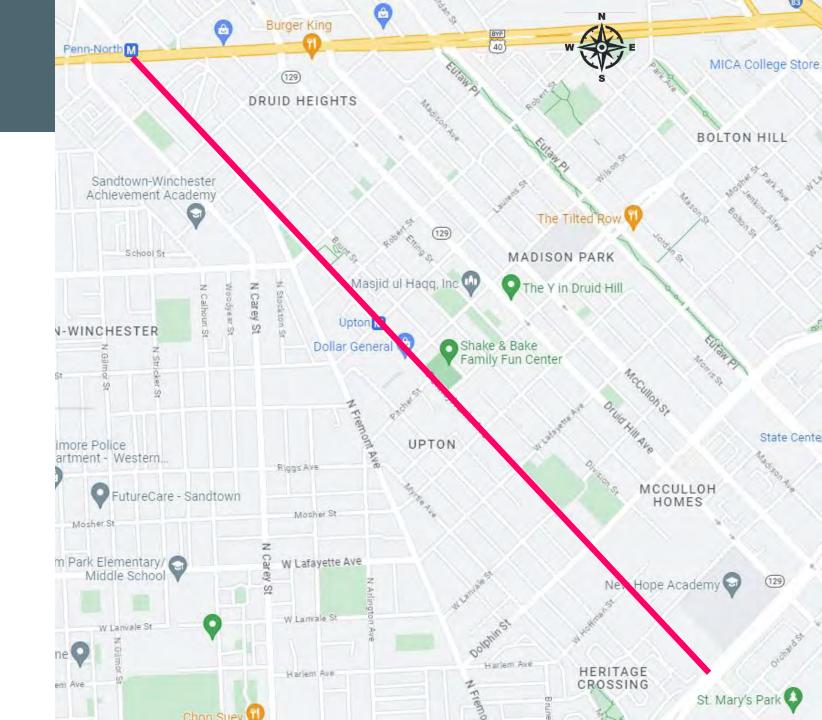


<u>US 1</u> Fulton Avenue from Lombard Street to North Avenue

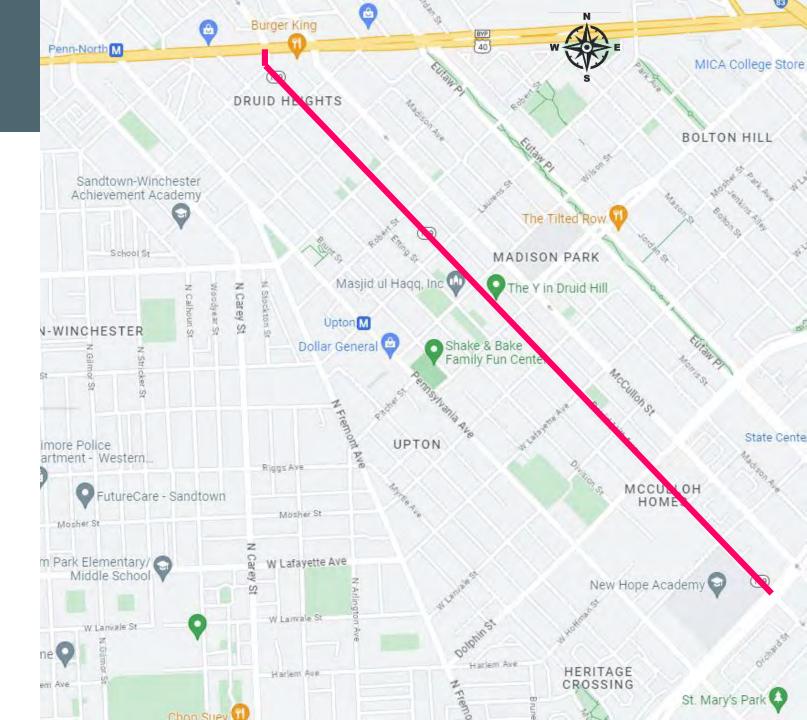


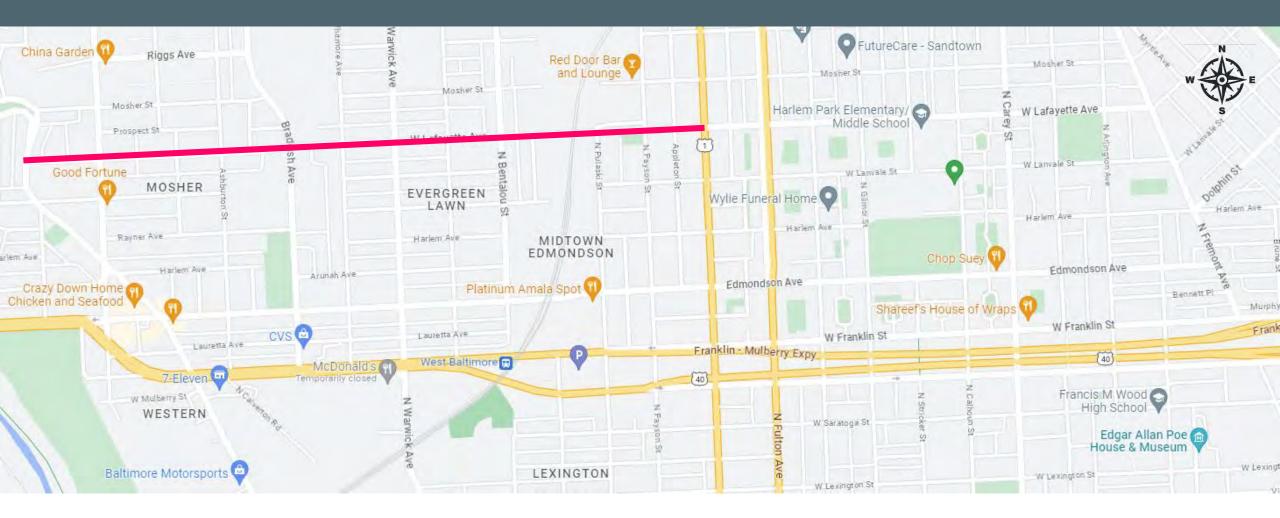
#### Pennsylvania Avenue

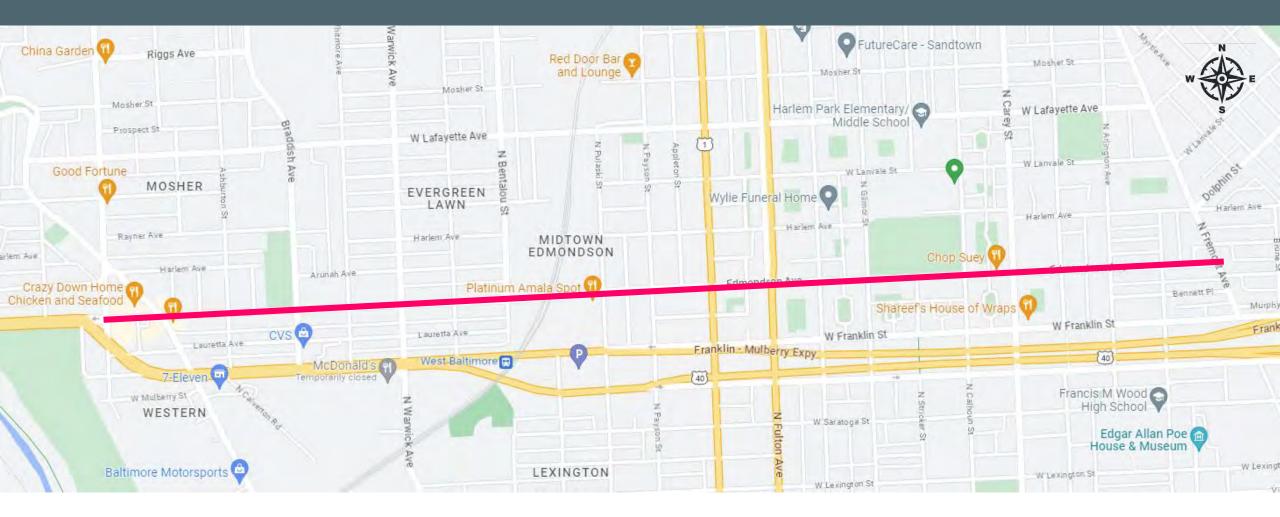
from North Avenue to Martin Luther King, Jr. Boulevard

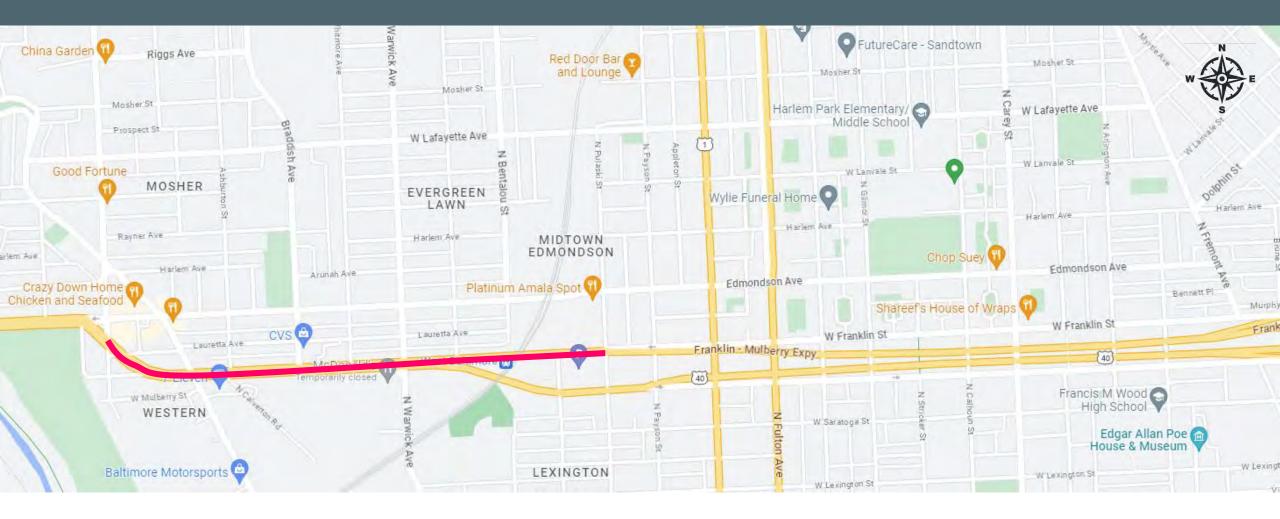


MD 129 Druid Hill Avenue from North Avenue to Martin Luther King, Jr. Boulevard

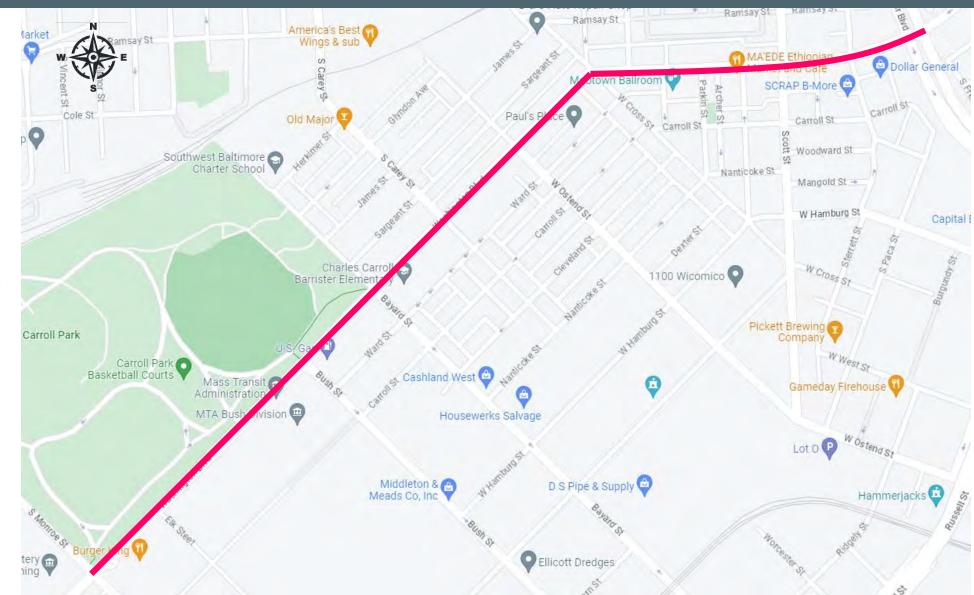


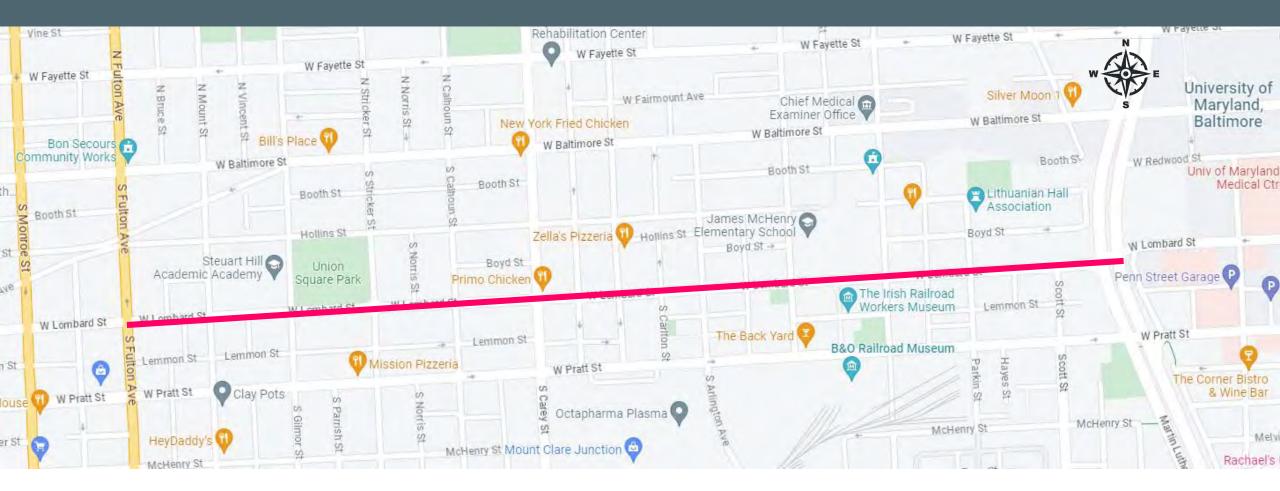




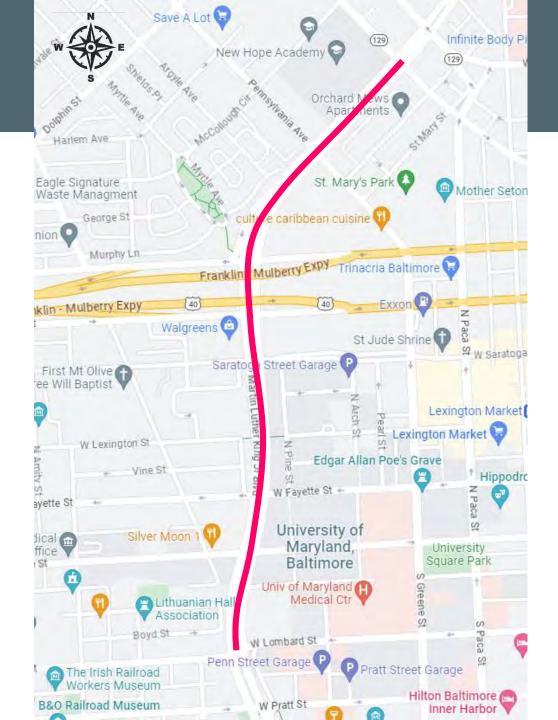


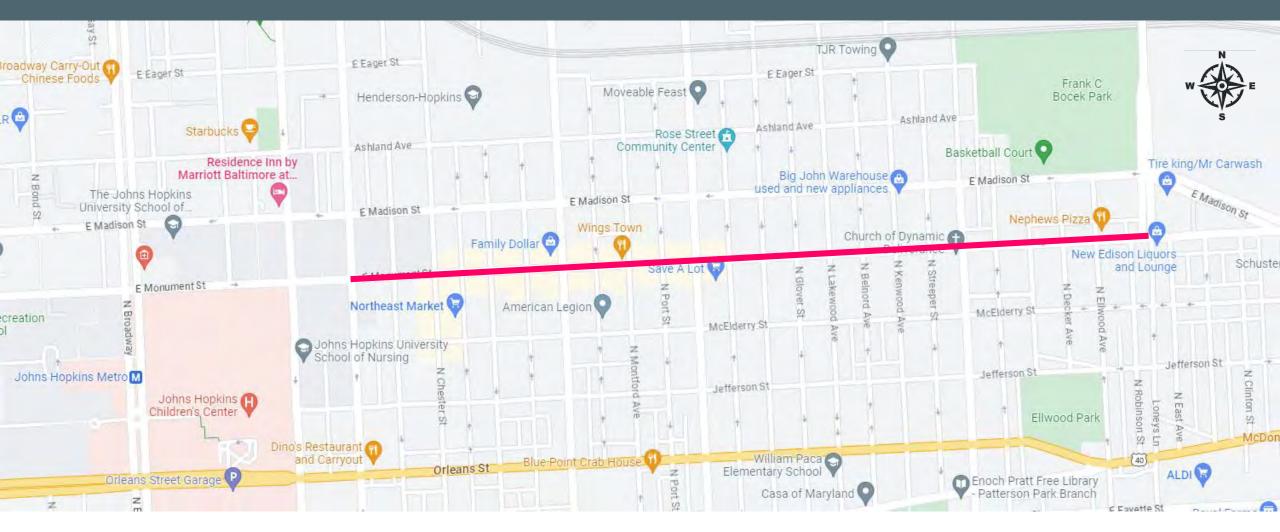
Washington Boulevard from South Monroe Street to Martin Luther King, Jr. Boulevard



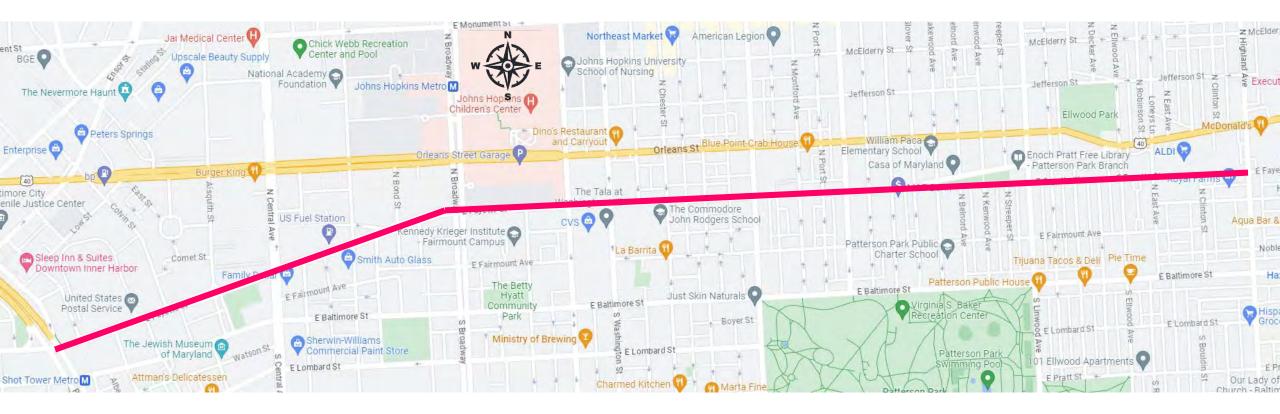


Martin Luther King, Jr. Boulevard From West Lombard Street to Druid Hill Avenue

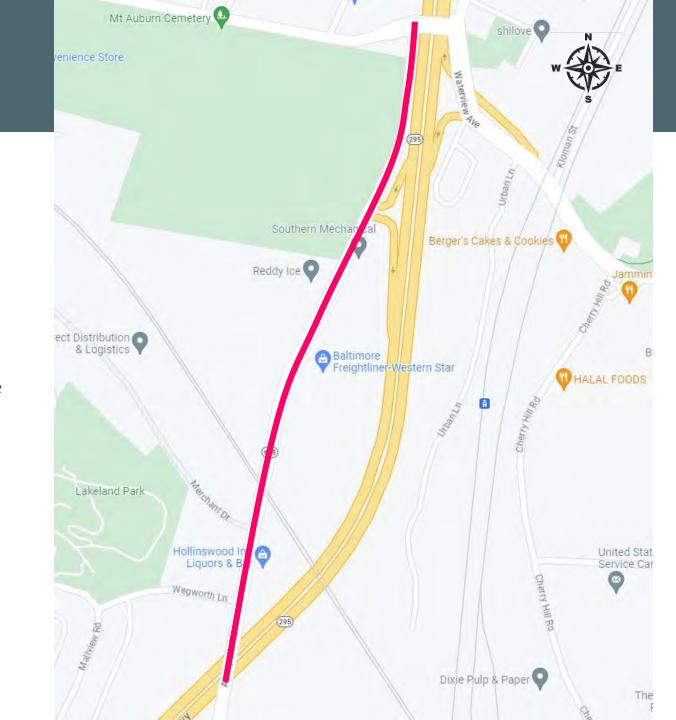




Monument Street from Washington Street to Edison Highway

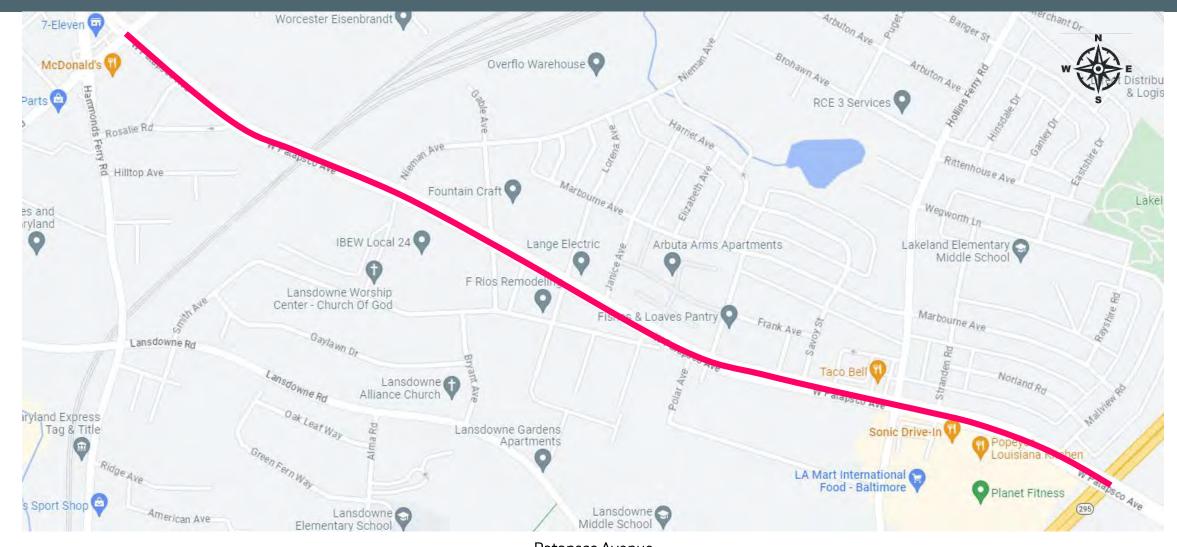


East Fayette Street from Fallsway to Highland Avenue

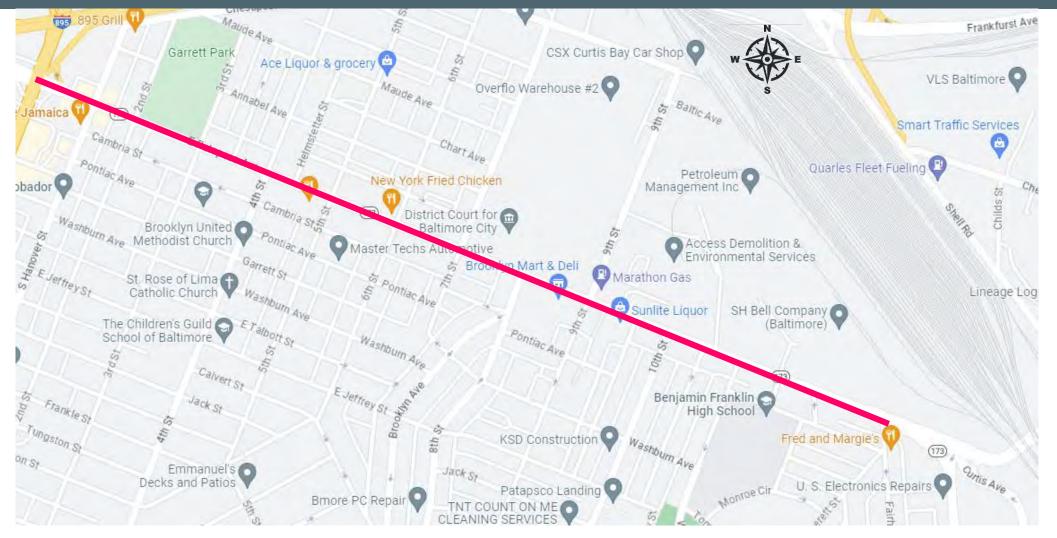


MD 648 Baltimore Washington Parkway

Annapolis Road from Baltimore Washington Parkway to Waterview Avenue



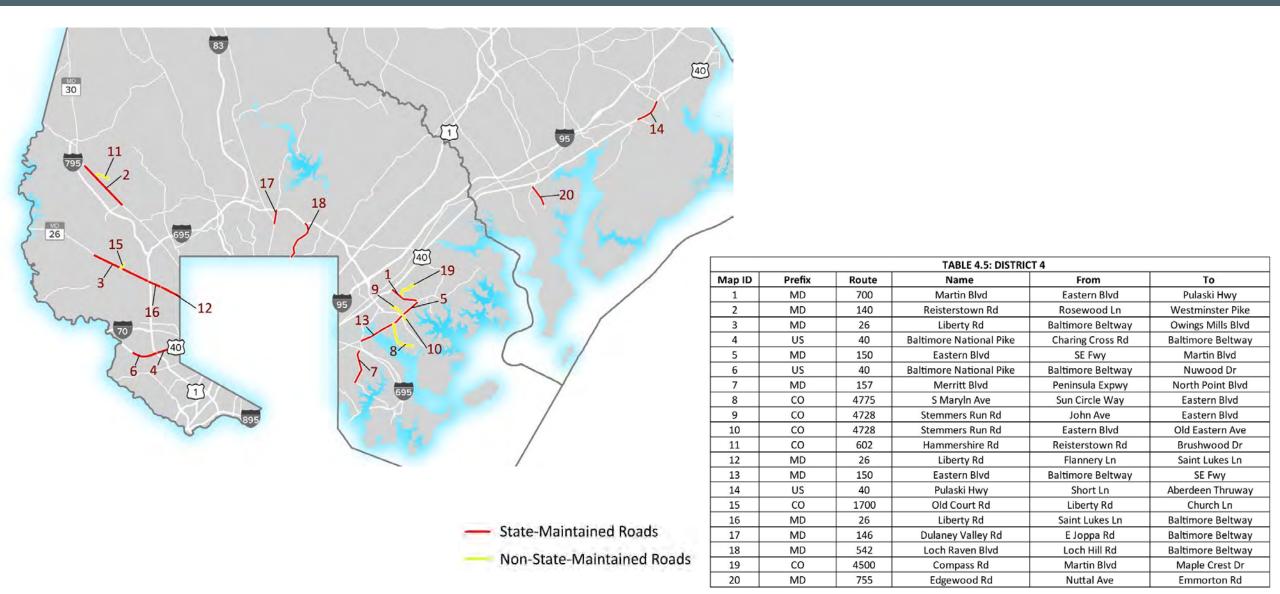
Patapsco Avenue from Washington Boulevard to Baltimore Washington Parkway

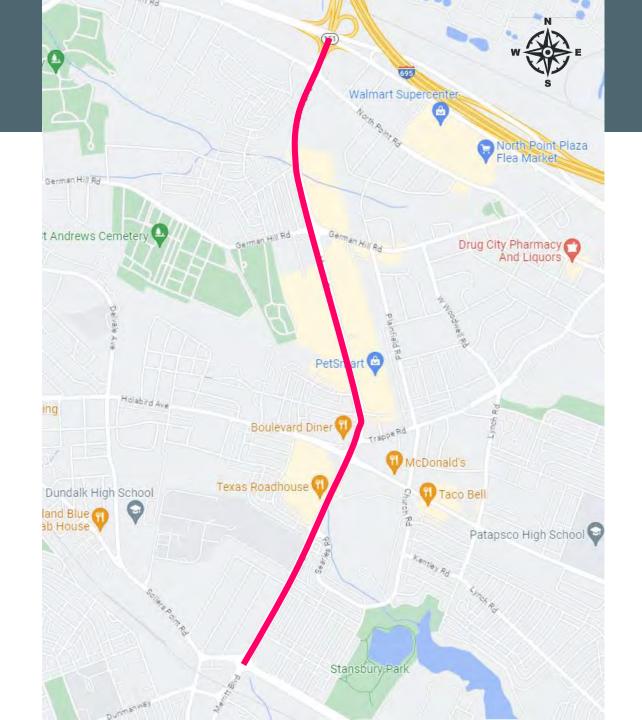


MD 173 Patapsco Avenue from Potee Street to Fairhaven Avenue

# Batimore and Harford County

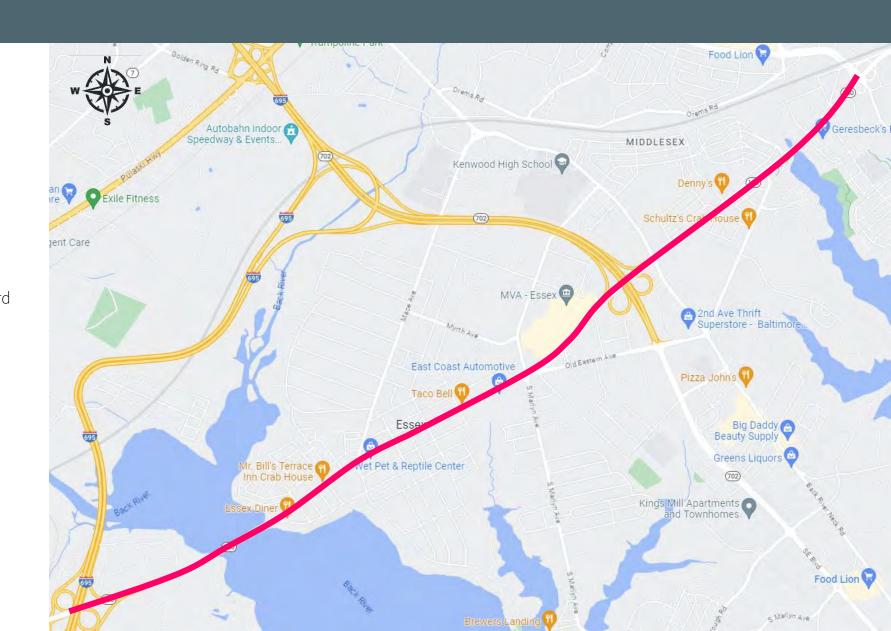
#### High-risk areas, District 4





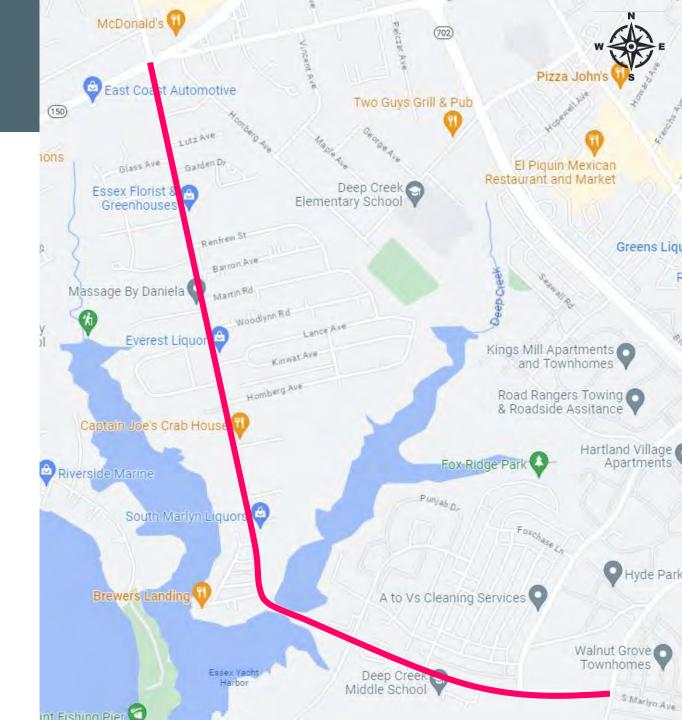
<u>MD 157</u> Merritt Boulevard from Peninsula Expressway to North Point Boulevard

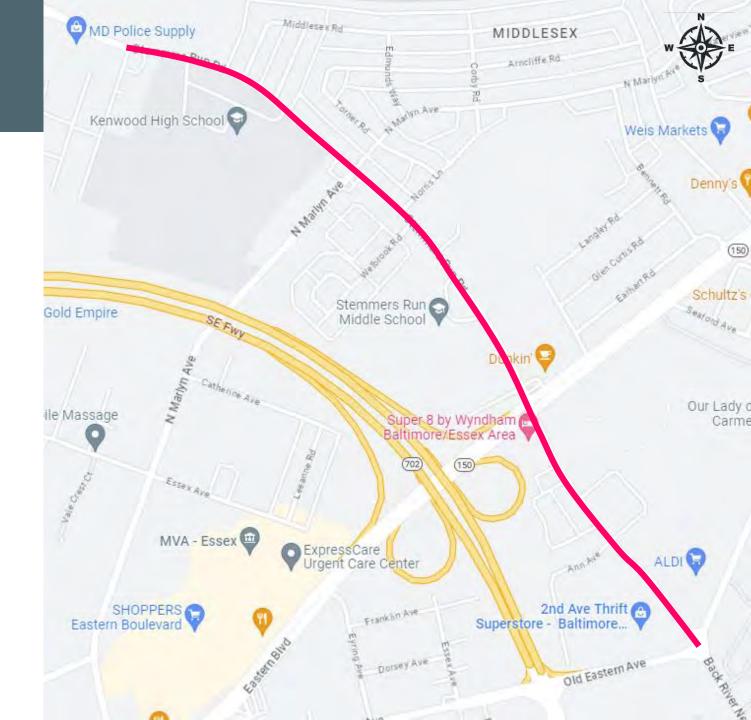
<u>MD 150</u> Eastern Boulevard from I-695 to Martin Boulevard



#### <u>Marlyn Avenue</u>

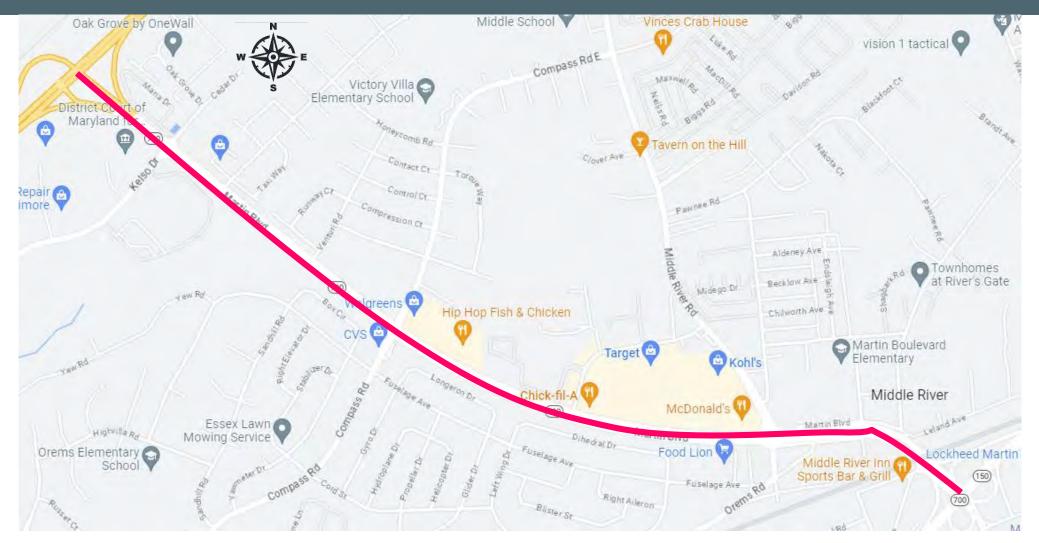
from Eastern Boulevard to Sun Circle Way





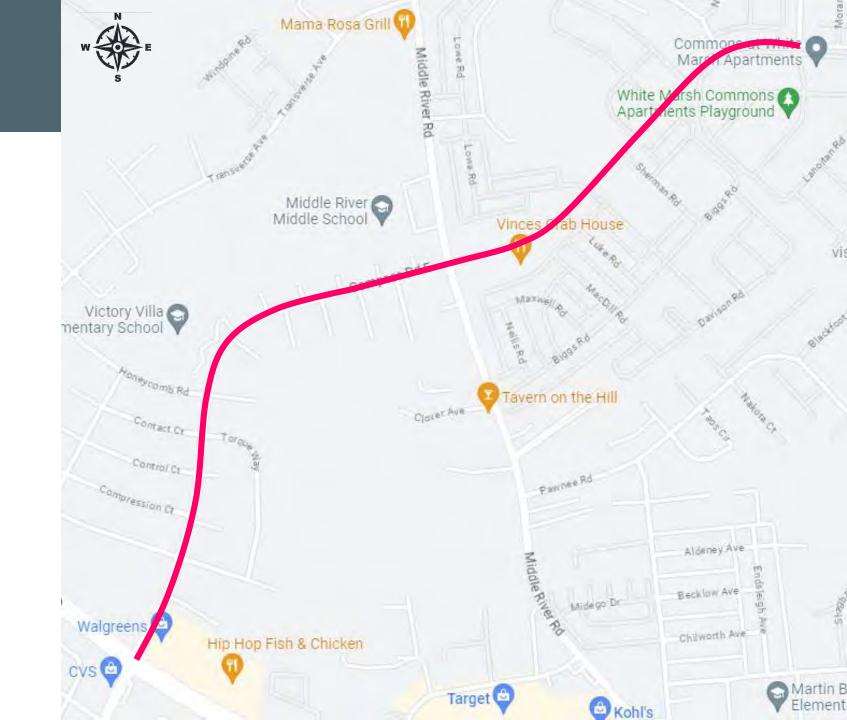
Stemmers Run Road

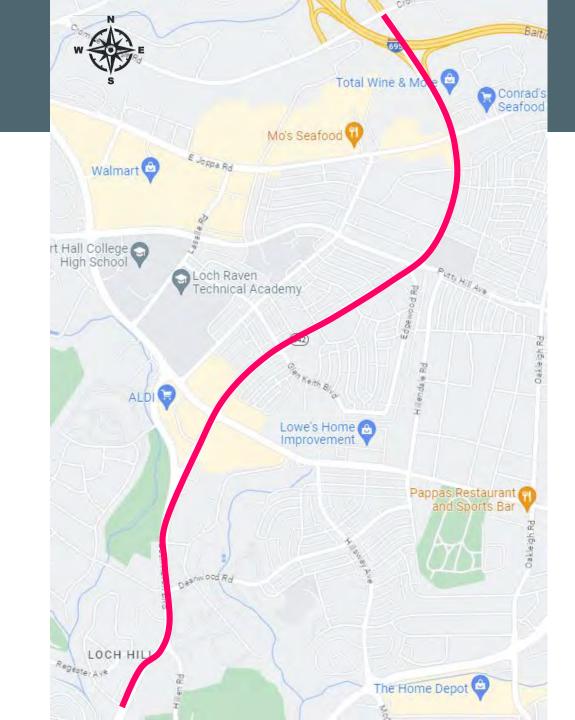
from Theresa Avenue to Old Eastern Avenue



MD 700 Martin Boulevard from Pulaski Highway to Eastern Boulevard

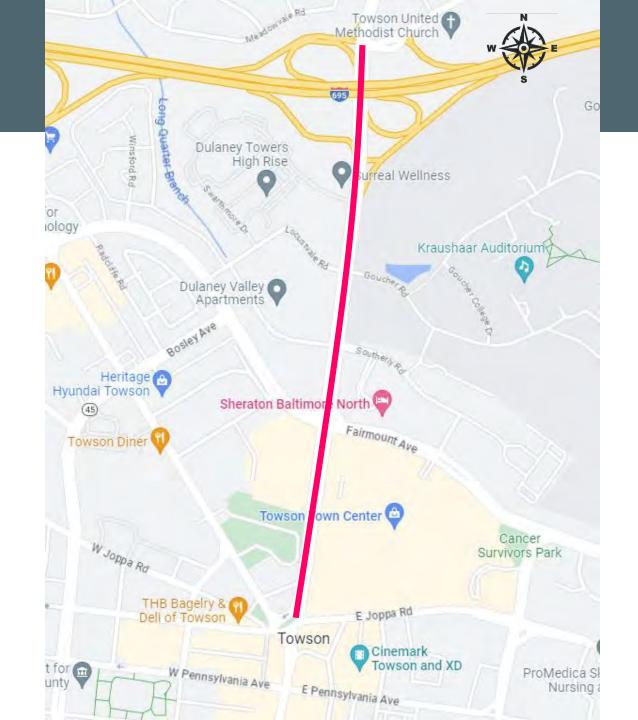
<u>Compass Road</u> from Martin Boulevard to Maple Crest Drive

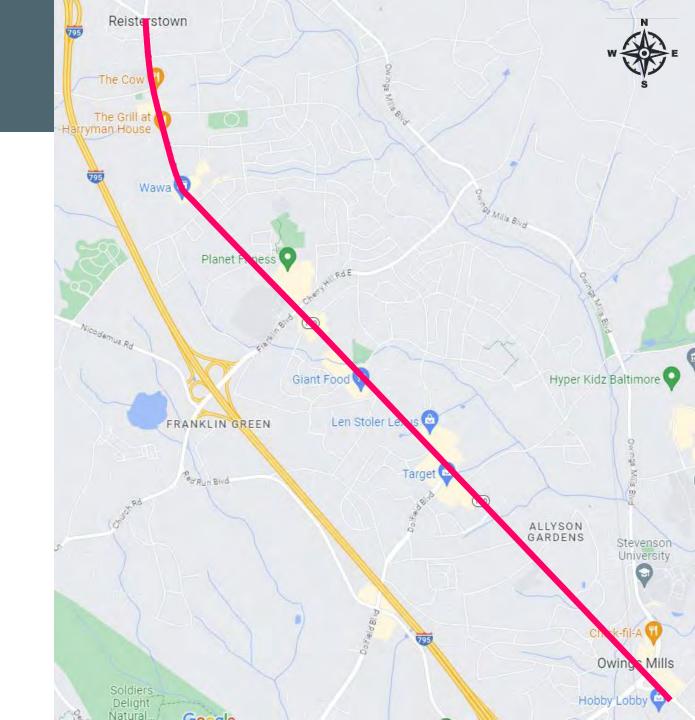




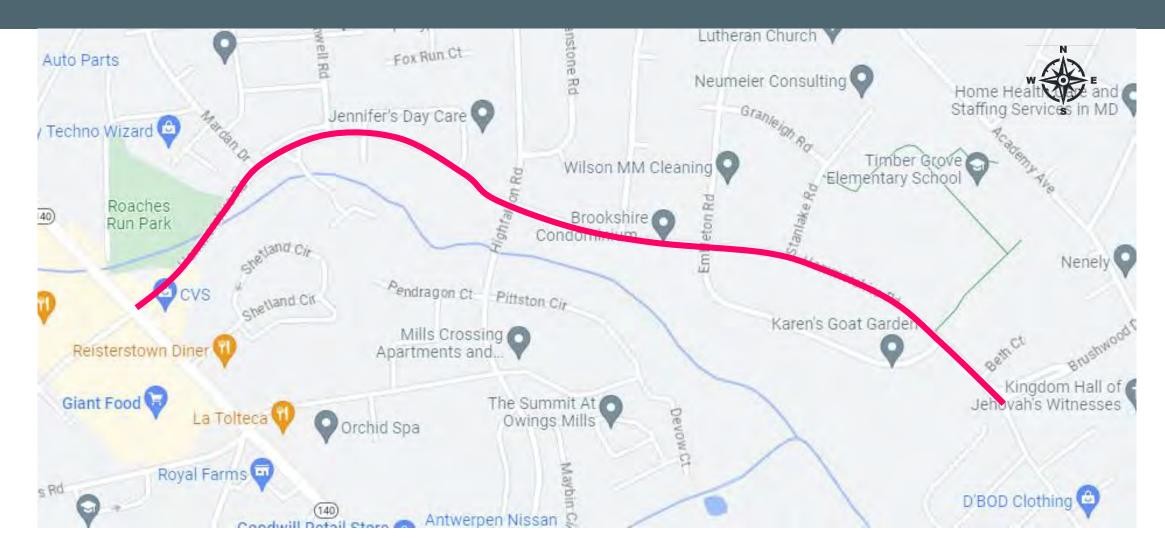
MD 542 Loch Raven Boulevard from Loch Hill Road to I-695

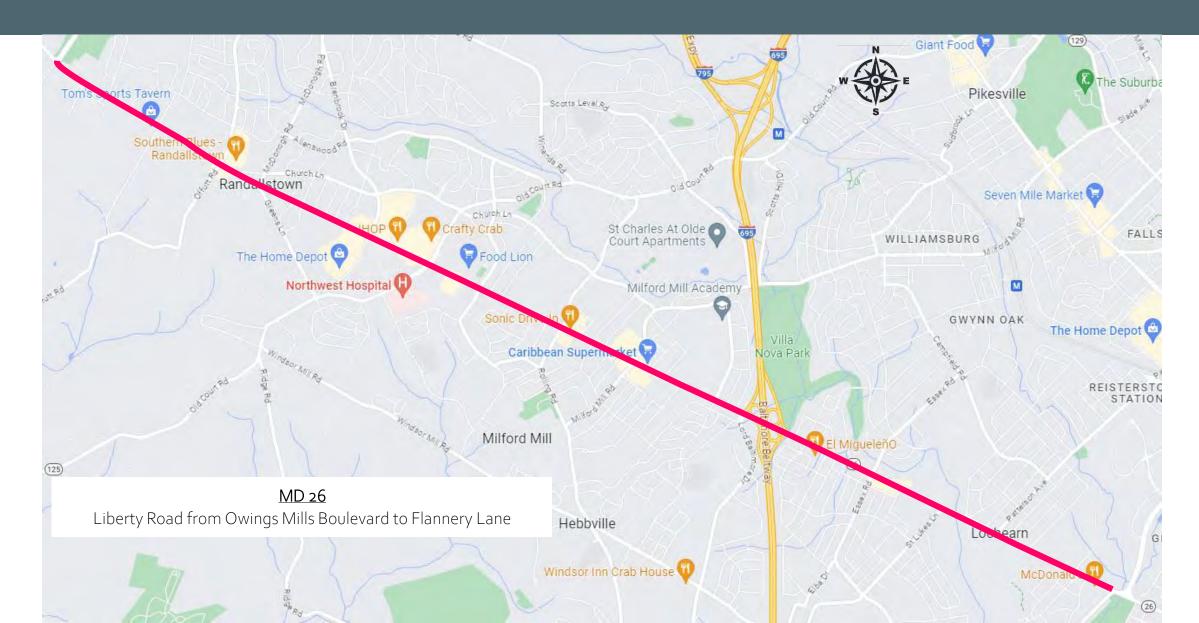
MD 146 Dulaney Valley Road from East Joppa Road to I-695

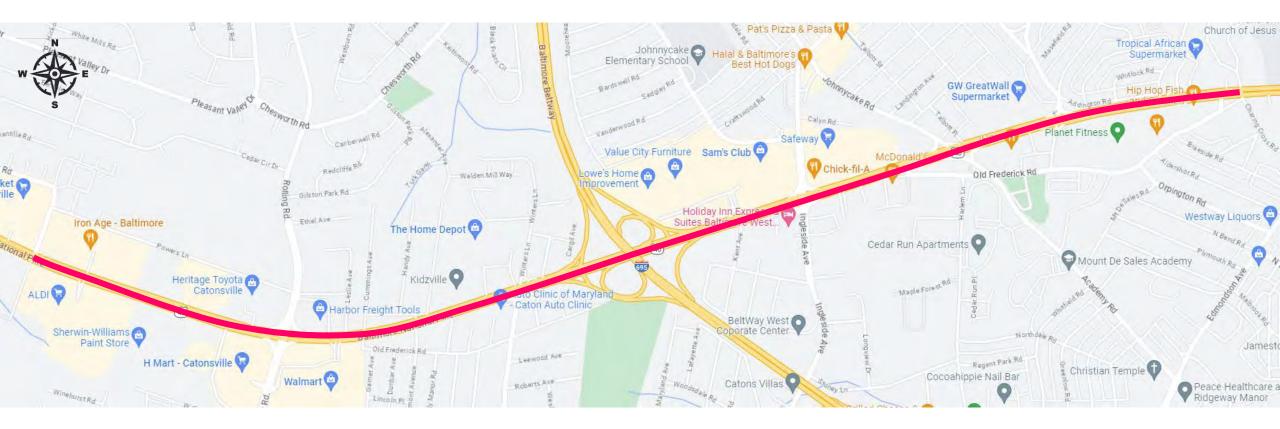




MD 140 Reisterstown Road from Westminster Pike to Rosewood Lane







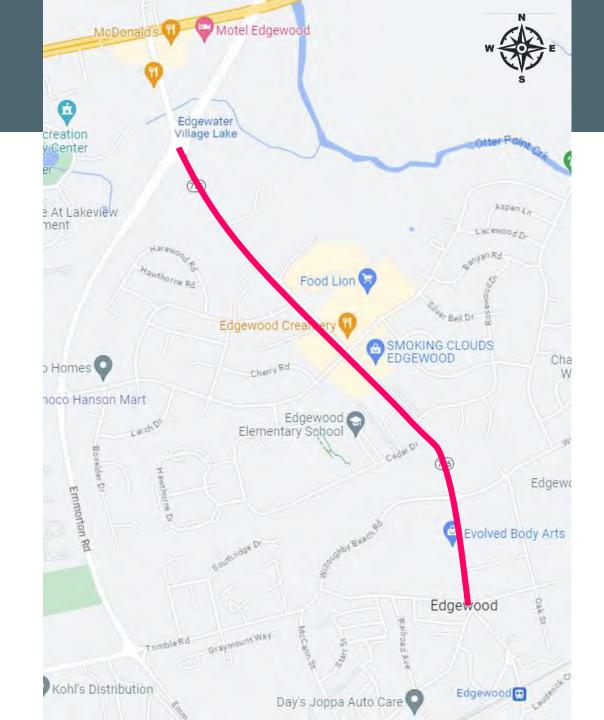
#### Target 🙆 (22) **District 4** (462) Aberdeen High School 🜍 Prost German Restaurant Aberdeen, MD (132) Aberdeen Ascend Dispensary C - Aberdeen <u>US 40</u> Pulaski Highway from Short Lane to Aberdeen Thruway Aberdeen Diner er Chicken Rico Golden Corral Walmart Sup nonLa OldPhiladelphia MTN2 - Amazon Sort Center

(715)

(40)

(22)

MD 755 Edgewood Road from Nuttal Avenue to Emmorton Road



# Anne Arundel County

#### High-risk areas, District 5

TABLE 4.6: DISTRICT 5					
Map ID	Aap ID Prefix Route		Name	From	То
1	MD	2	Governor Ritchie Hwy	Baltimore Annapolis Rd	Mountain Rd
2	MD	2	Governor Ritchie Hwy	Belle Grove Rd	Church St
3	MD	3	Crain Hwy	Paul T. Pitcher Memorial Hwy	I-97
4	MD	170	Belle Grove Rd	I-895	Baltimore Annapolis Blvd
5	MD	235	Three Notch Rd	Great Mills Rd	Chancellors Run Rd
6	MD	228	Berry Rd	Crain Hwy	Bunker Hill Rd
7	MD	450	West St	Taylor Ave	Old Solomons Island Rd
8	US	301	Crain Hwy	Billingsley Rd	Berry Rd
9	US	301	Crain Hwy	Berry Rd	Mattawoman Beantown Rd
10	MD	2	Governor Ritchie Hwy	E Ordnance Rd	Baltimore Beltway
11	CO	345	Smallwood Dr	Middletown Rd	Crain Hwy
12	MD	237	Chancellors Run Rd	Three Notch Rd	Great Mills Rd
13	MD	2	Governor Ritchie Hwy	E Furnace Branch Rd	Baltimore Annapolis Blvd
14	CO	3616	8th Ave NW	Crain Hwy	Baltimore Annapolis Blvd
15	MD	3	Crain Hwy	Baltimore Annapolis Blvd	Quarterfield Rd
16	MD	648	Baltimore Annapolis Blvd	Baltimore Beltway Inner Loop	I-97
17	MD	2	Governor Ritchie Hwy	West St	Baltimore Annapolis Blvd
18	MD	2	Governor Ritchie Hwy	Baltimore Annapolis Blvd	Rt 10
19	US	301	Crain Hwy	Hawthorne Rd	Marshall Corner Rd
20	MD	246	Great Mills Rd	Chancellors Run Rd	FDR Blvd
21	CO	634	Central Ave	Crain Hwy	Dorsey Rd
22	MD	246	Great Mills Rd	Old Great Mills Rd	Chancellors Run Rd

— State-Maintained Roads

Non-State-Maintained Roads



# Carrol and Howard County

#### High-risk areas, District 7

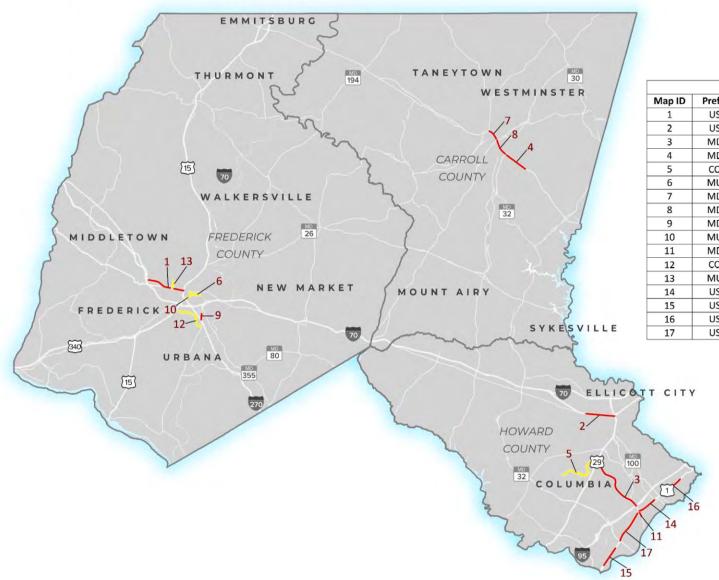


TABLE 4.8: DISTRICT 7					
Map ID Prefix Route		Route	Name	From	То
1	US	40	W Patrick St	Kehne Rd	Frederick Fwy
2	US	40	Baltimore National Pike	Centennial Ln	Columbia Pike
3	MD	175	Rouse Pkwy	Columbia Pike	I-95
4	MD	140	Baltimore Blvd	Malcolm Dr	Carroll County Northern Landfill
5	CO	794	Little Patuxent Pkwy	Hickory Ridge Rd	Columbia Pike
6	MU	1400	W South St	W Patrick St	S Market St
7	MD	140	Baltimore Blvd	Manchester Rd	Littlestown Pk
8	MD	140	Baltimore Blvd	Malcolm Dr	Manchester Rd
9	MD	85	Buckeystown Pike	Eisenhower Memorial Hwy	Julia Ln
10	MU	761	S Jefferson St	Prospect Blvd	W Patrick St
11	MD	175	Waterloo Rd	Washington Blvd	Patuxent Institution Driveway
12	CO	1179	Crestwood Blvd	Hannover Dr	Buckeystown Pike
13	MU	925	McCain Dr	Butterfly Ln	W Patrick St
14	US	1	Washington Blvd	Waterloo Rd	MD 103
15	US	1	Washington Blvd	Freestate Dr	Patuxent River
16	US	1	Washington Blvd	MD 100	Montgomery Rd
17	US	1	Washington Blvd	Patuxent Fwy	Waterloo Rd

State-Maintained Roads

Non-State-Maintained Roads

## Queen Anne's County

#### High-risk areas, District 2

TABLE 4.3: DISTRICT 2						
		Route	Name	From	То	
1	MD	322	Easton Pkwy	Ocean Gateway	Bay St	
2	US	40	Pulaski Hwy	Marley Rd	North East Rd	
3	MD	272	Northeast Rd	Pulaski Hwy	John F Kennedy Memorial Hwy	
4	US	40	W Pulaski Hwy	S Bridge St	Elkton Rd	
5	US	40	E Pulaski Hwy	Delaware Ave	S Bridge St	
6	MD	213	Augustine Herman Hwy	E Lewis Shore Rd	E Pulaski Hwy	
7	US	40	E Pulaski Hwy	Delancy Rd	Delaware Ave	
8	US	40	Pulaski Hwy	Charlestown Crossing Blvd	North East Rd	
9	US	40	W Pulaski Hwy	Elkton Rd	Thiokol Rd	
10	MD	213	Bridge St	E Pulaski Hwy	Elkton Blvd	
11	MD	213	Washington Ave	N Cross St	Morgnec Rd	
12	MU	1091	Washington St	Glebe Rd	Easton Byp	
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TABLE 4.3. DICTOLOT A

State-Maintained Roads

Non-State-Maintained Roads



## Current Status and Next steps for the

Current Status:

- More than 130 people attended consultation meetings and more than 150 individual online survey responses were received.
- The Draft Assessment is completed and is currently under SHA internal review.

Next Steps:

- October: Comment compilation and draft report for review and approval by the Governor's Office and FHWA.
- By November 15: Publication of final document.

## Thank you!

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