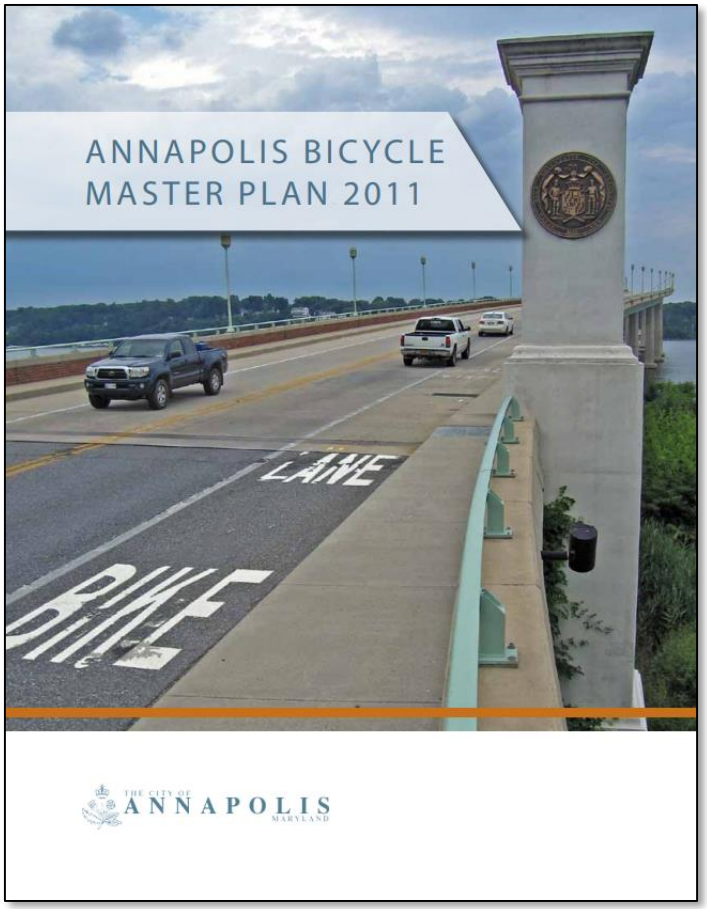
Transportation and Land Use Connections

- *Bicycle Facility Standards*
- *Bay Ridge Avenue Bikeway Feasibility*

CITY OF ANNAPOLIS

BALTIMORE METROPOLITAN COUNCIL



"… it shall be the policy of the City of Annapolis to invite, welcome and encourage more bicycling by planning, developing and continually improving safe and accessible streets through programs like Safe Routes to School and off-road networks and amenities such as bicycle storage, signage, education, enforcement, and maps."

TOOLE DESIGN

CITY OF ANNAPOLIS

BICYCLE FACILITY DESIGN GUIDANCE TECHNICAL MEMORANDUM

September 25, 2023 | DRAFT

CONTENTS

IDENTIFYING THE TYPE OF BIKE INFRASTRUCTURE TO DESIGN

DEFINING FACILITIES

The following section provides current bike facility definitions for purposes of this technical memo. Variations of select definitions can be found in the *Annapolis Bicycle Master Plan (2011)* and *MSHA Bicycle Policy & Design Guidelines (2015).*

Specific Types of Bicycle Facilities

Standard bicycle lane – An on-road facility intended for bicycle travel which designates space for bicyclists distinct from motor vehicle traffic. It does not include shared lanes, sidewalks, signed bicycle routes, or shared lanes with shared lane markings.

Separated bicycle lanes – A bicycle lane that is physically separated from motor vehicle traffic by vertical elements and a horizontal buffer. These are also sometimes referred to as protected bike lanes or cycle tracks.

Shared use paths – Multiuse path designed primarily for use by bicyclists, pedestrians, and/or micromobility device users for transportation and recreation purposes. Shared use paths are physically separated from motor vehicle traffic by an open space or barrier. Shared use paths are sometimes referred to as paths or trails.

Buffered bicycle lanes – A bicycle lane that is separated from motor vehicle traffic by a horizontal buffer.

Bicycle boulevards – Streets designed to prioritize bicycle traffic by minimizing motorized traffic volumes and lowering vehicular operating speeds. They are also referred to as neighborhood bikeways or greenways.

Standard Bike Lane	Buffered Bike Lane	Separated Bike Lane	Shared Use Path	Bicycle Boulevard
Melvin Ave / Tucker St	*Ann Arbor, MI*	*Jennifer Rd / Admiral Dr.*	*Forest Dr / Cherry Grove Av*	*Franklin St*

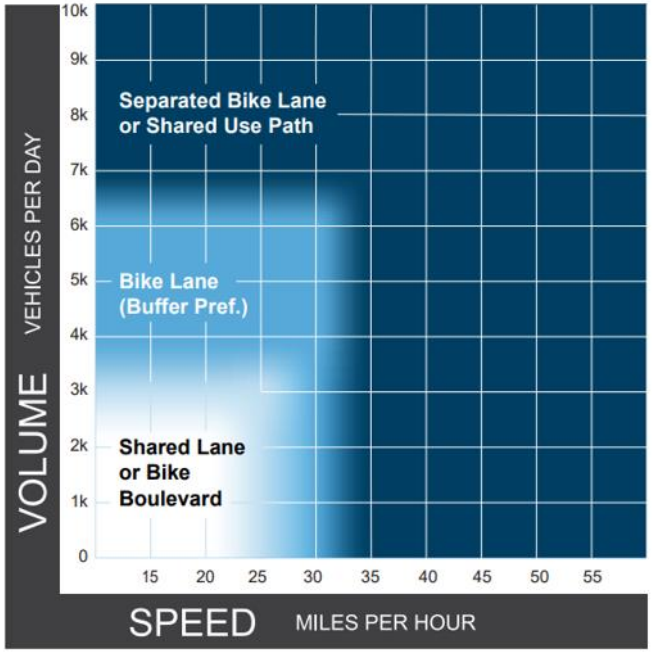
Figure 7 Bicycle Facility Types

ALIGNING BIKEWAYS FACILITIES AND USERS

The City of Annapolis intends to build a "low-stress bicycling network," which minimizes exposure of bicyclists to motorized traffic and conflicts with pedestrians while providing direct and convenient connections to destinations and other bike facilities. There are three elements and key principles of low-stress bicycle networks: safety, comfort, and connectivity. These, and additional factors detailed below, play a critical role in aligning bikeway facilities and users.

Consideration of Existing Infrastructure

In evaluating the alignment of users and infrastructure there are always existing conditions to consider. The 2019 FHWA Bikeway Selection Guide details several that are critical to consider beginning with speed and volume, as illustrated in the figure below.



1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed

2 Advisory bike lanes may be an option where traffic volume is < 3k ADT

Figure 9 Preferred Bikeway Type for Urban, Urban Core, Suburban and Rural Town Contexts
Source: 2019 FHWA Bikeway Selection Guide

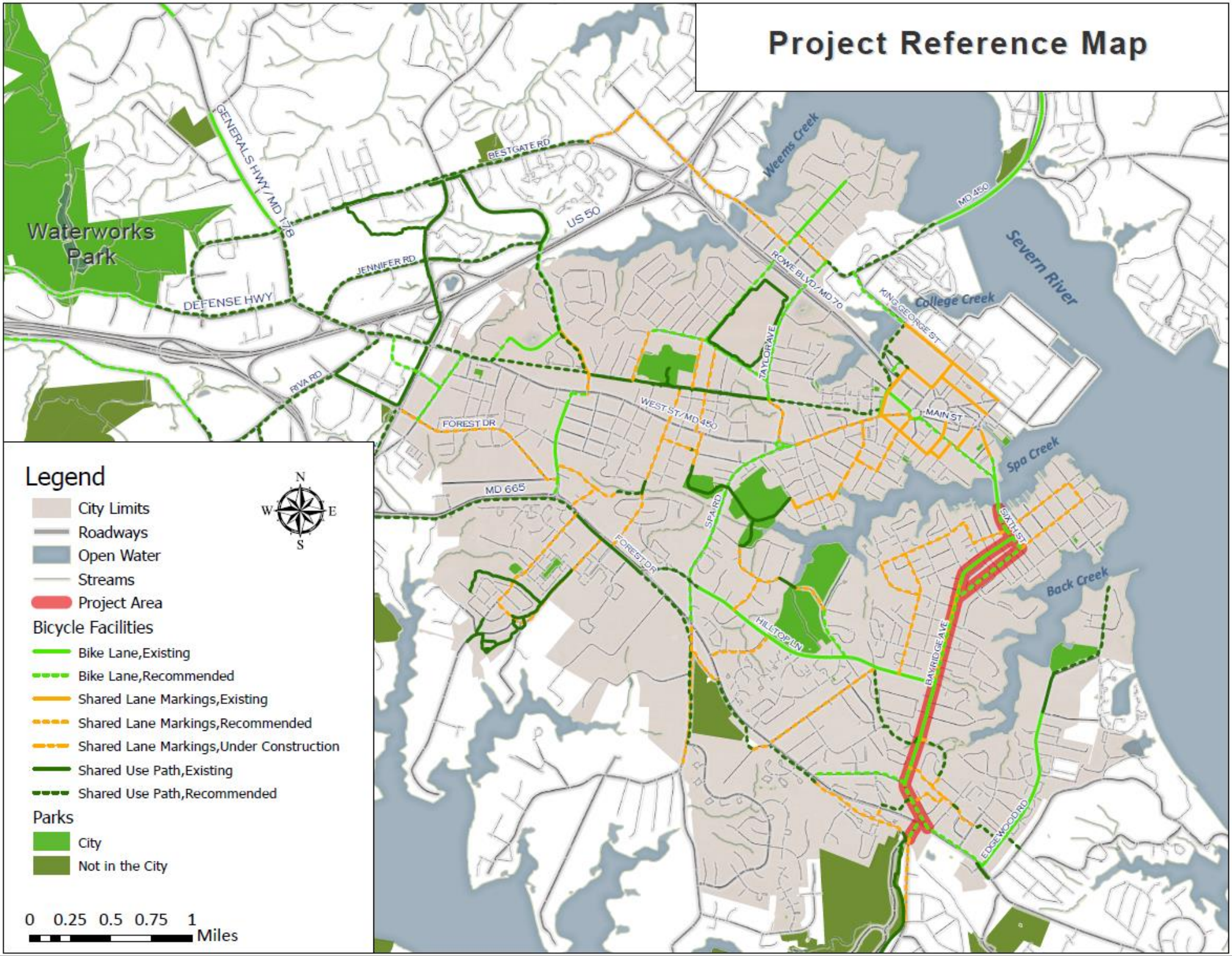
Street Design Concepts for Bay Ridge Avenue Corridor

FINAL

10/30/2023

TOOLE DESIGN

Project Reference Map




Bay Ridge Ave
Forest Dr
ONLY
ONLY
BRAKING NEWS:
STOP FOR PEDESTRIANS.
STOP
LOOK ALIVE
EYES ON THE ROAD.
NOT ON YOUR PHONE.
LOOK ALIVE
SLOW DOWN.
WATCH FOR PEDESTRIANS.
NOT SO FAST
LOOK ALIVE
LookAliveMD.org
READ THE HAND:
WAIT FOR THE SIGNAL.
LOOK ALIVE

Locations

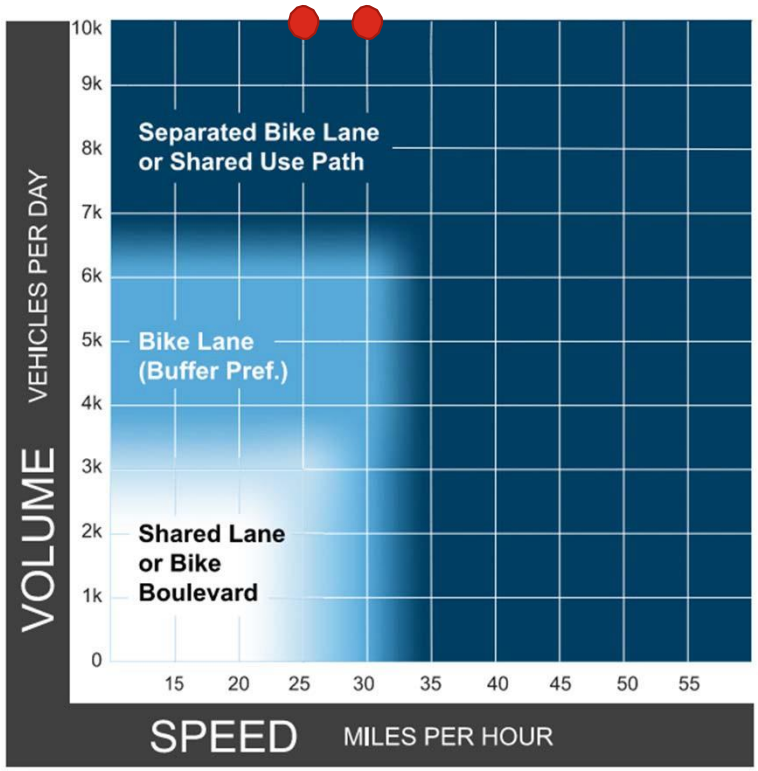
- Cross sections
  1. 6th Street
  2. Chesapeake Ave
  3. Bay Ridge Shopping Center
  4. Bay Ridge and Van Buren Street
  5. Bay Ridge and Timber Creek Dr
  6. Bay Ridge and Forest
  7. Hillsmere Dr

- Plan view sheets
  1. 6th Street and Chesapeake Avenue
  2. Bay Ridge Ave and Chesapeake Ave
  3. Bay Ridge Ave and Tyler Ave
  4. Bay Ridge Ave, Forest Dr and Hillsmere Dr
- Note: red boxes indicate approximate limits that will be shown on plan sheet

TOOLE DESIGN

FHWA Bikeway Selection Guide

- Preferred Bikeway Type for Urban Core, Suburban and Rural Town Contexts



Notes

1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.

2 Advisory bike lanes may be an option where traffic volume is <3K ADT.

3 See page 32 for a discussion of alternatives if the preferred bikeway type is not feasible.

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Traffic Volumes

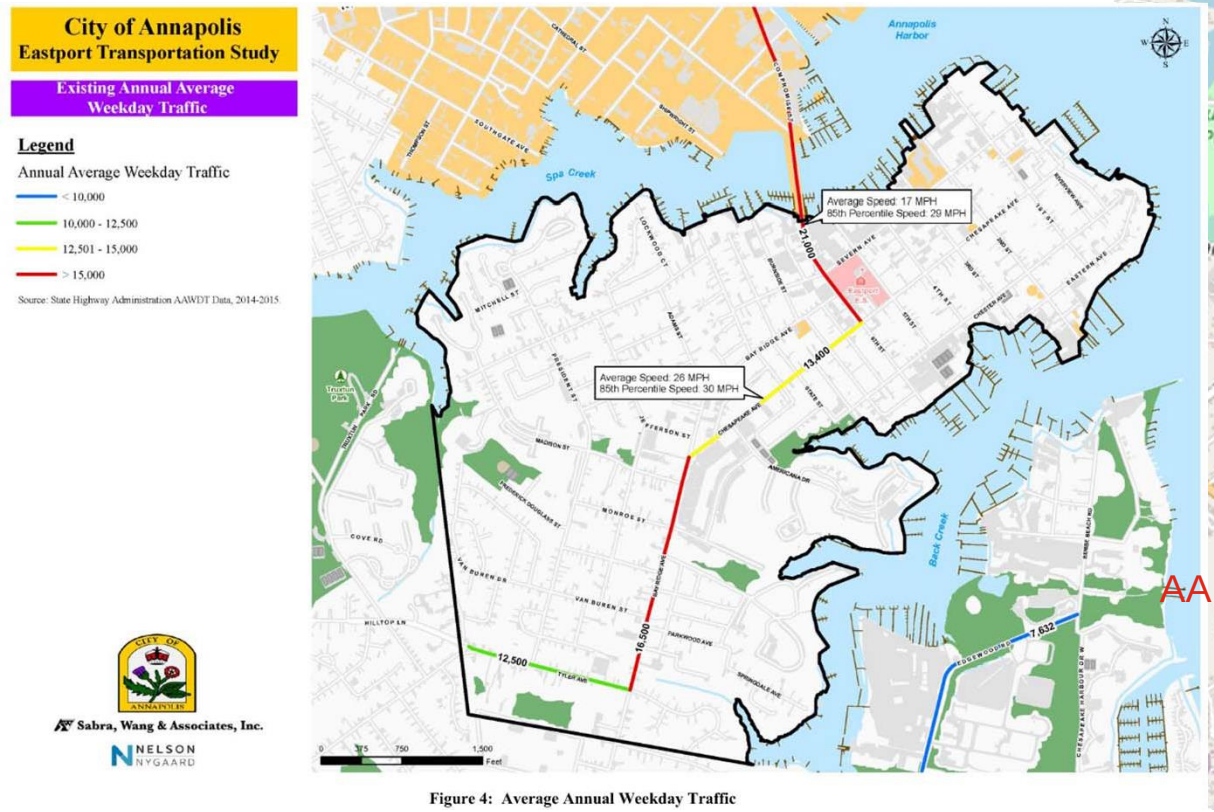
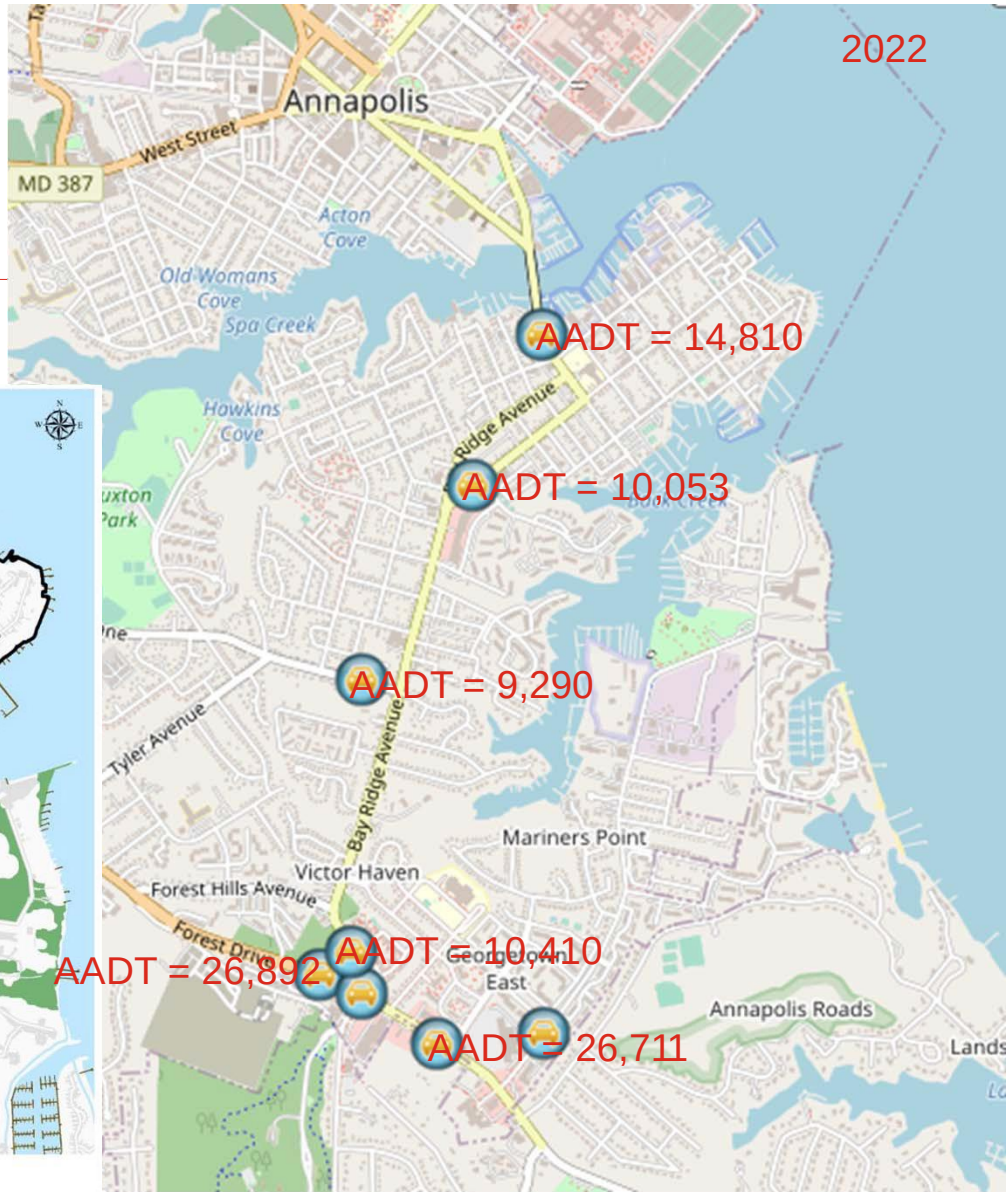


Figure 4: Average Annual Weekday Traffic



Functional Classification

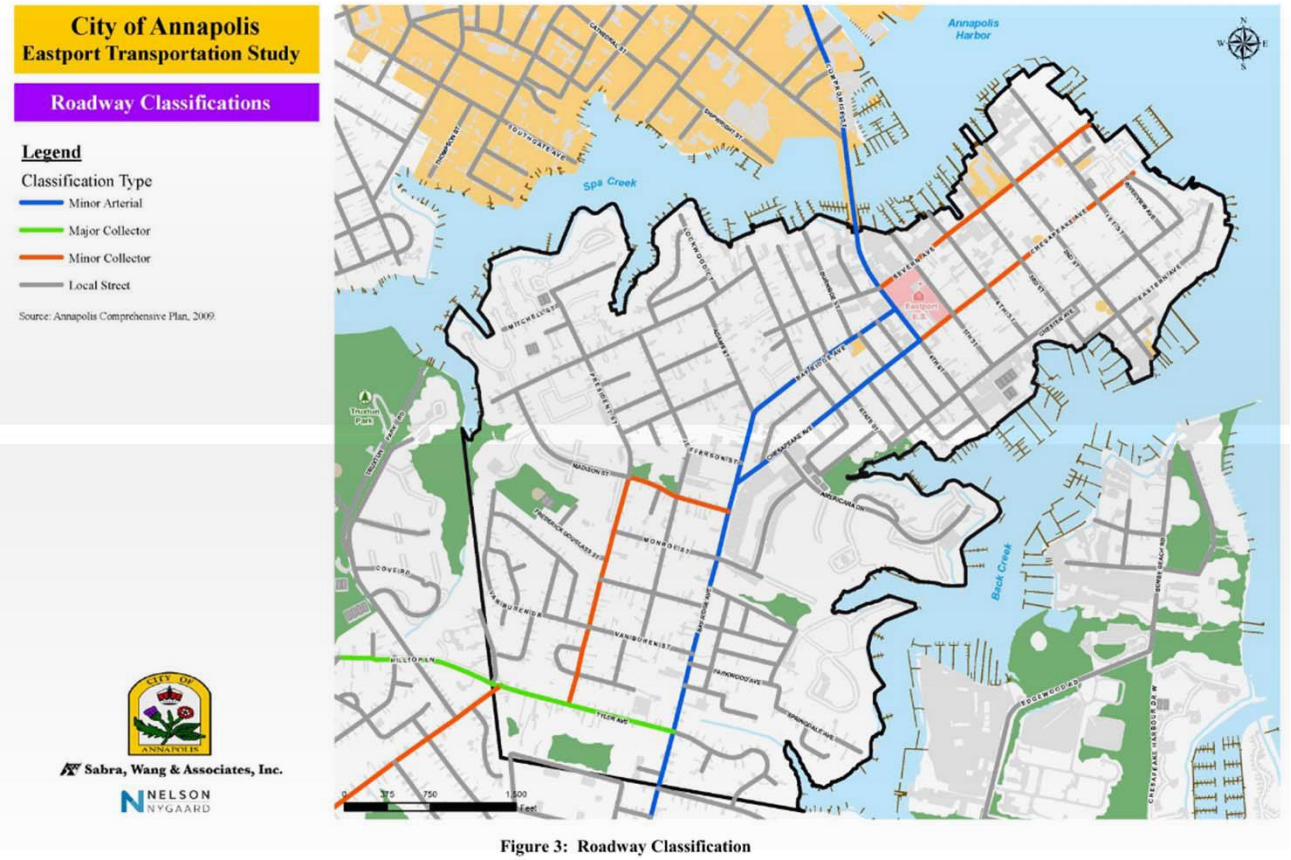


Figure 3: Roadway Classification

TOOLE DESIGN

Proposed Cross Section Assumptions and Options

Assumptions:

- Maintain utility pole locations
- 10.5’ minimum lane width, 11’ where space allows, curb to curb minimum 24’
- 10’ minimum shared-use path width, up to 13’ where space allows

Preliminary Options (submitted 3/07/2023):

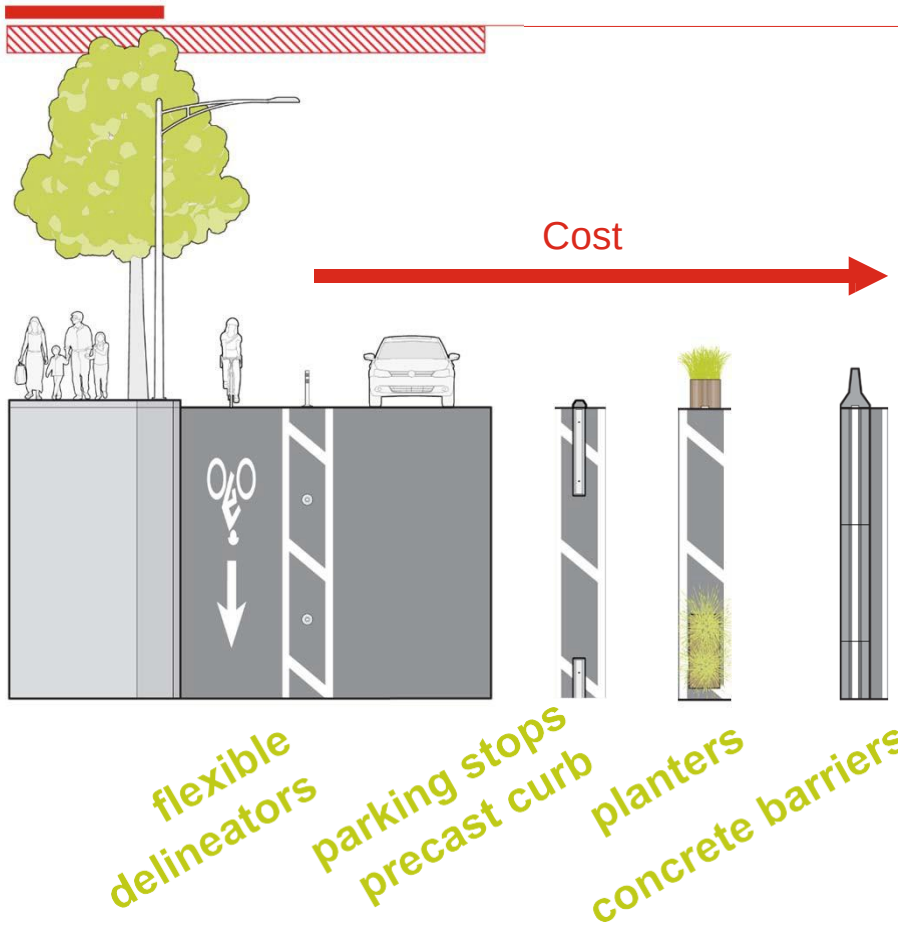
A. Maintain curbs – shown as two-way cycle track

B. Shift curbs – shown as shared-use path (wide sidewalk)

Generally, Option B selected as preferred option. Preferred option shown throughout this document.

TOOLE DESIGN

Types of Separated Bike Lane (SBL) Buffer Treatments



- Parking Supplements Street Buffer
- Considerations:
  - Bicyclist shy distance
  - Spacing
  - Durability
  - Clear zone
  - Door zone

Flexible Delineators

- Must meet MUTCD requirements for color and retroreflectivity
- Spaced frequently to prevent vehicle encroachment
- Supplemented with pavement markings
- Standard, high-performance, K-71/K-72
- Manufacturers include:
  - RubberForm, Street Smart Solutions, TreeTop, Tuff Curb, and US Reflector

TOOLE DESIGN

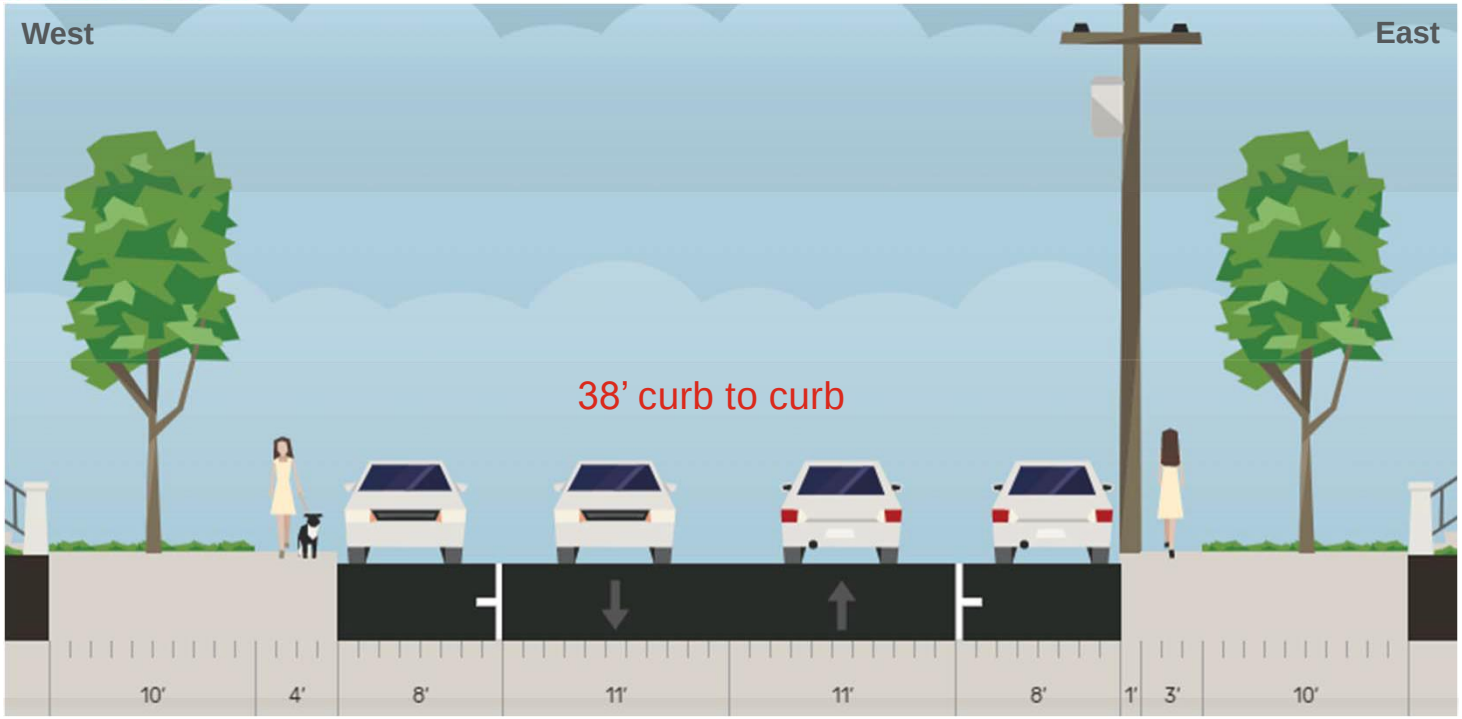
Parking Stops & Raised Lane Separators

- Precast concrete, granite, plastic, recycled rubber
- Spaced frequently to prevent vehicle encroachment
- Supplemented with pavement markings
- Manufacturers include:
  - RubberForm, Street Smart Solutions, TreeTop, Tuff Curb, and ZICLA
- Can add vertical markers at driveway/intersections for snow visiblity

TOOLE DESIGN

Chesapeake Avenue

2 – Chesapeake Avenue – Existing



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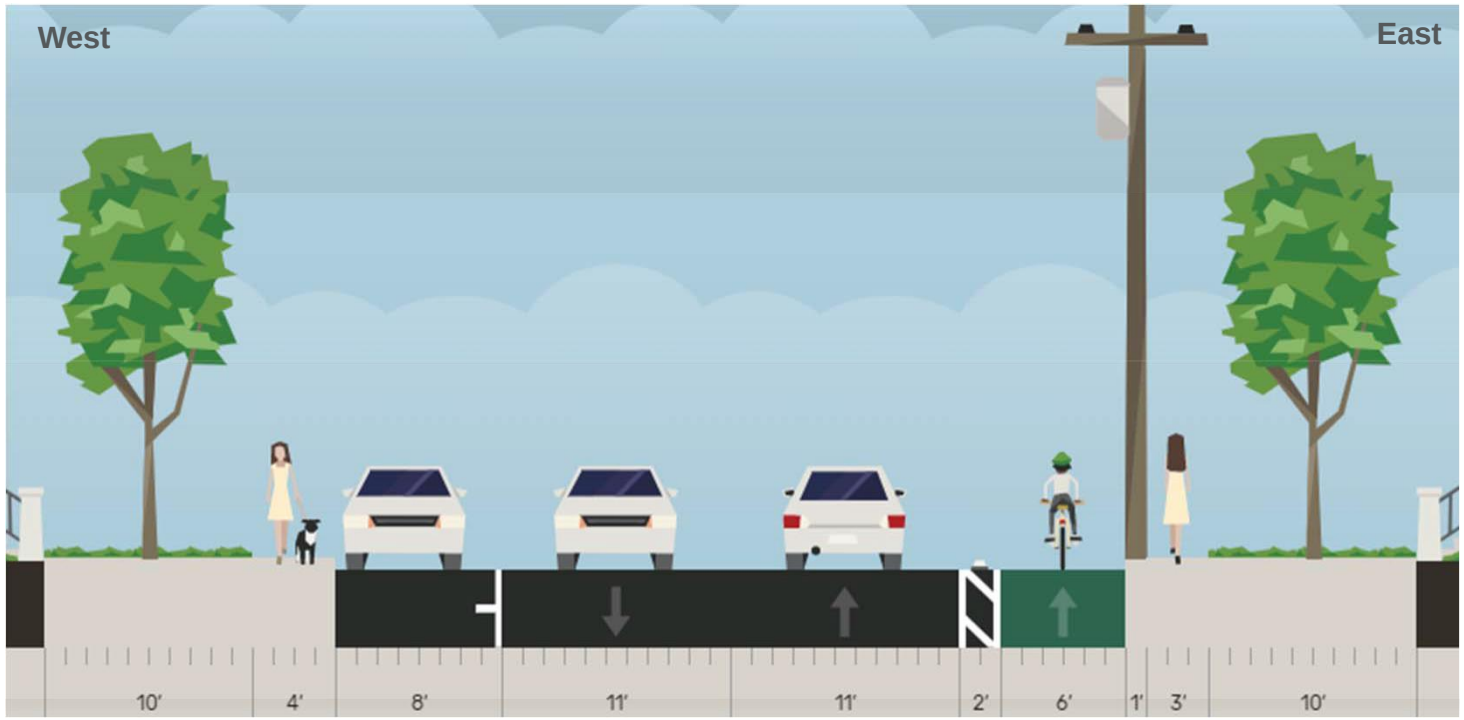
2 – Chesapeake Avenue – Proposed



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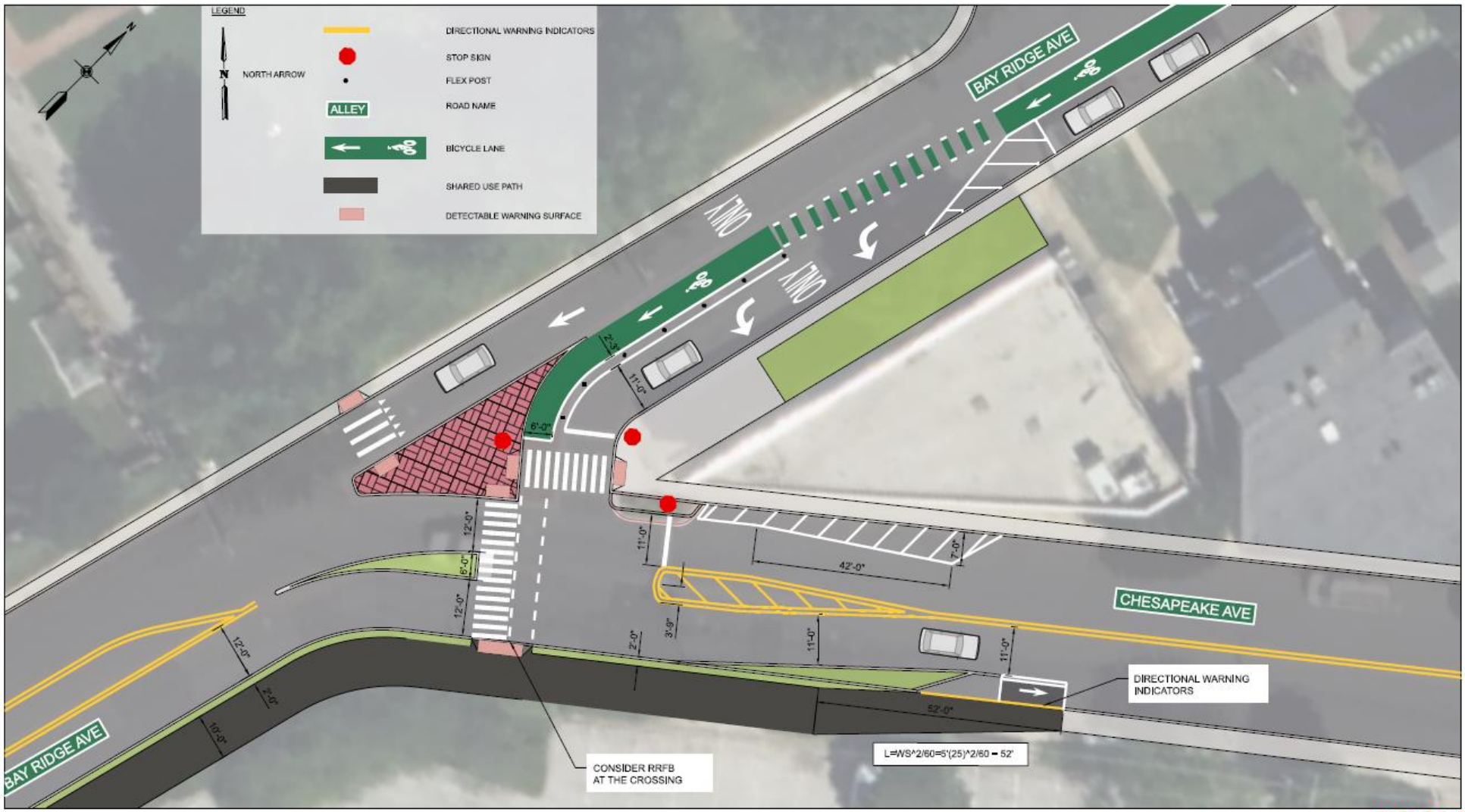
Bay Ridge Avenue and Chesapeake Avenue

TOOLE DESIGN



TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

0 20' 40' 60'

SCALE IN FEET

Exhibit 2

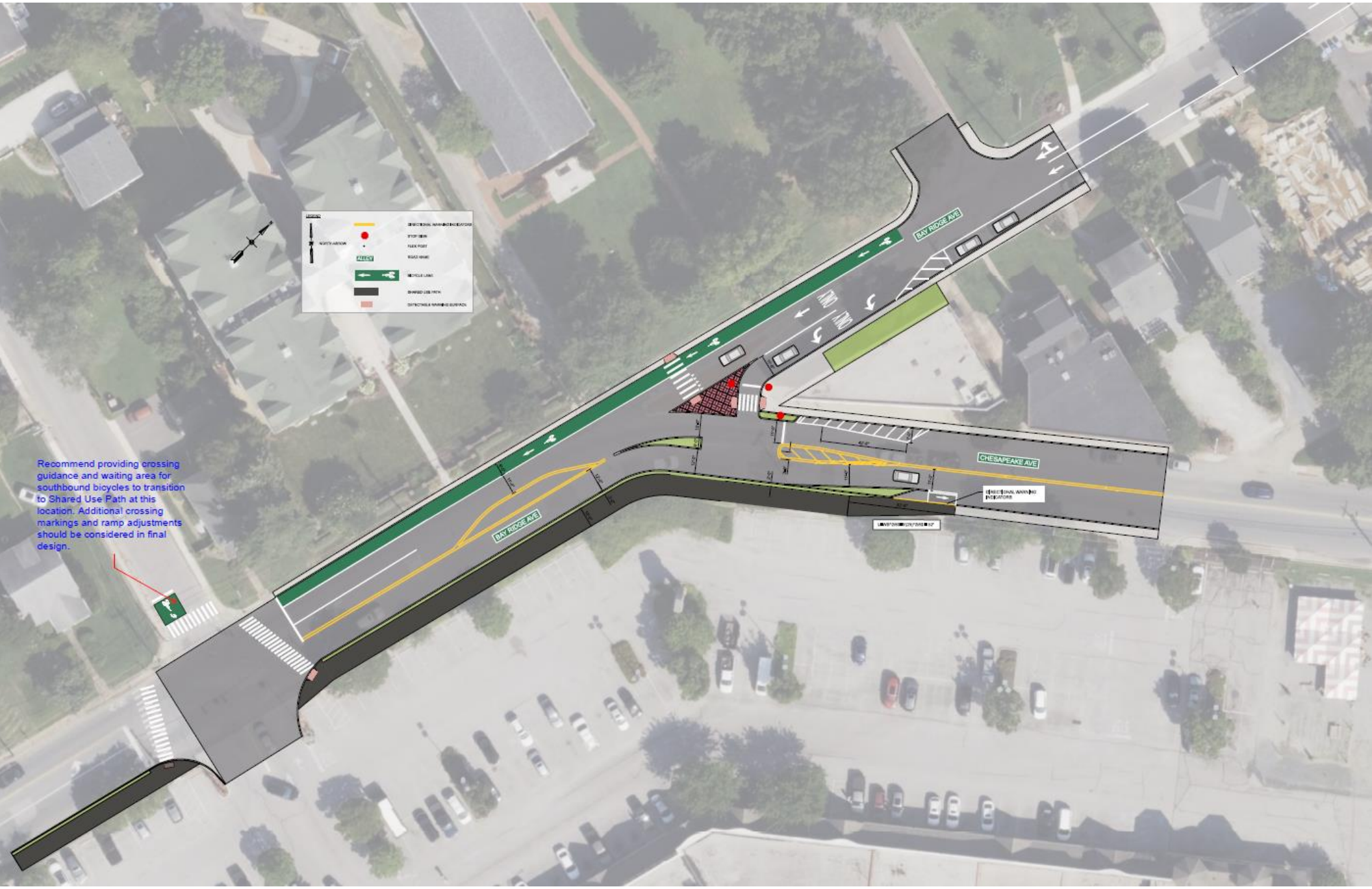
INTERSECTION 2 - BAY RIDGE AVENUE & CHESAPEAKE AVENUE

ANNAPOLIS TLC - BAY RIDGE AVE

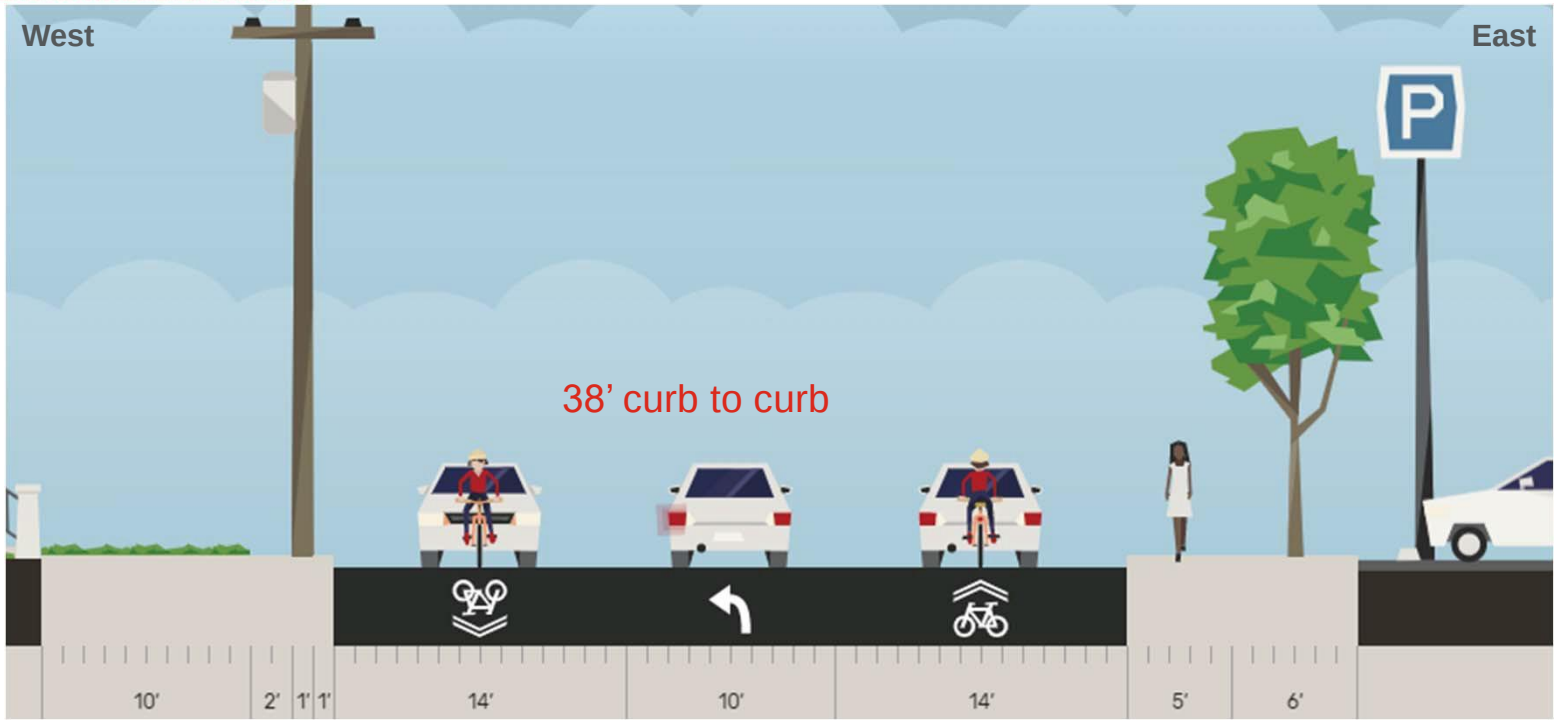
06/27/2023

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

H:\N3000\00\WL00104.01_P_Annapolis TLC - Bay Ridge Ave\PRODUCTION\CAD_REF\TDG 11x17 Exhibit.dgn
9/7/2005


Recommend providing crossing guidance and waiting area for southbound bicycles to transition to Shared Use Path at this location. Additional crossing markings and ramp adjustments should be considered in final design.
BAY RIDGE AVE
CHESAPEAKE AVE
BAY RIDGE AVE
ONE WAY

3 – Bay Ridge Shopping Center – Existing



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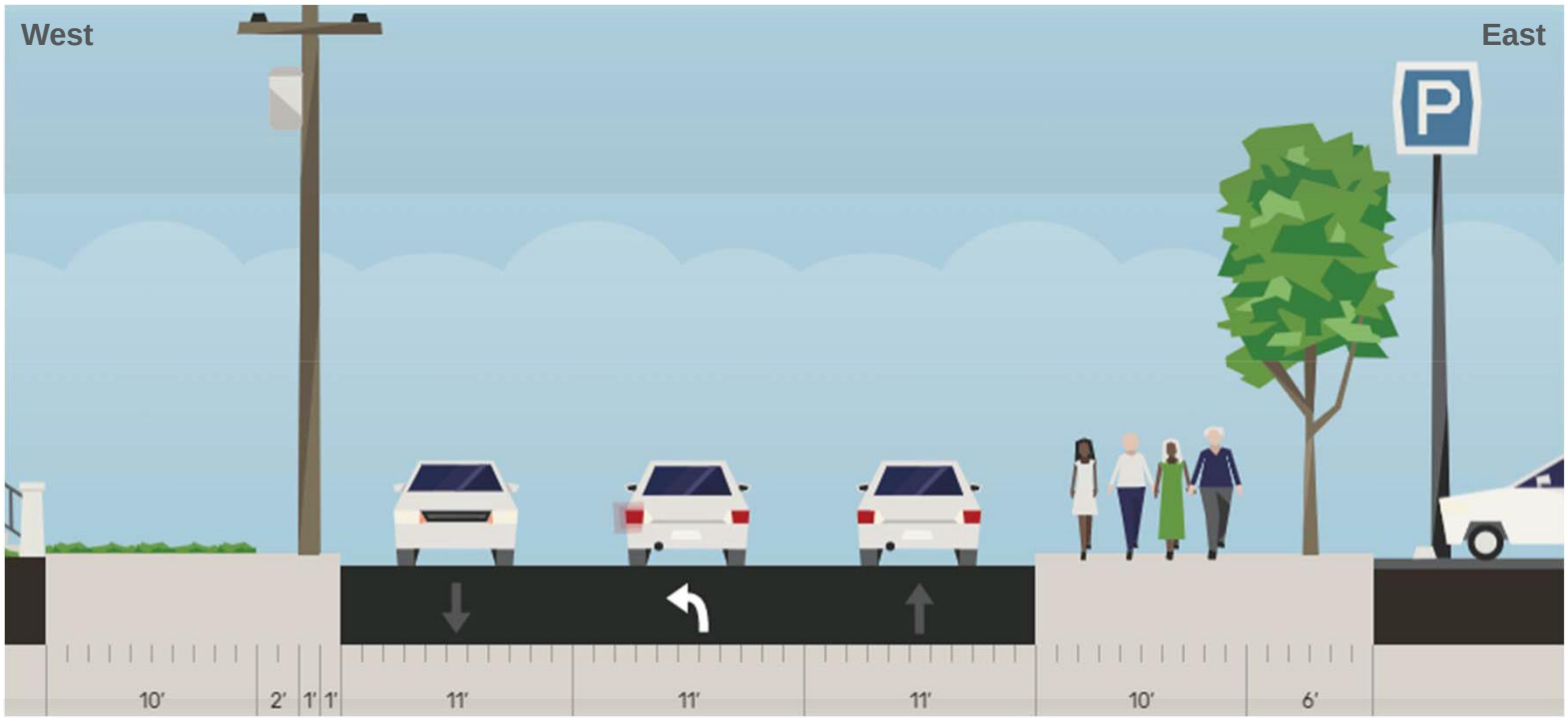
3 – Bay Ridge Shopping Center – Proposed



TOOLE DESIGN


THANK YOU
CITY OF
ANNAPOLIS
BALTIMORE
METROPOLITAN
COUNCIL