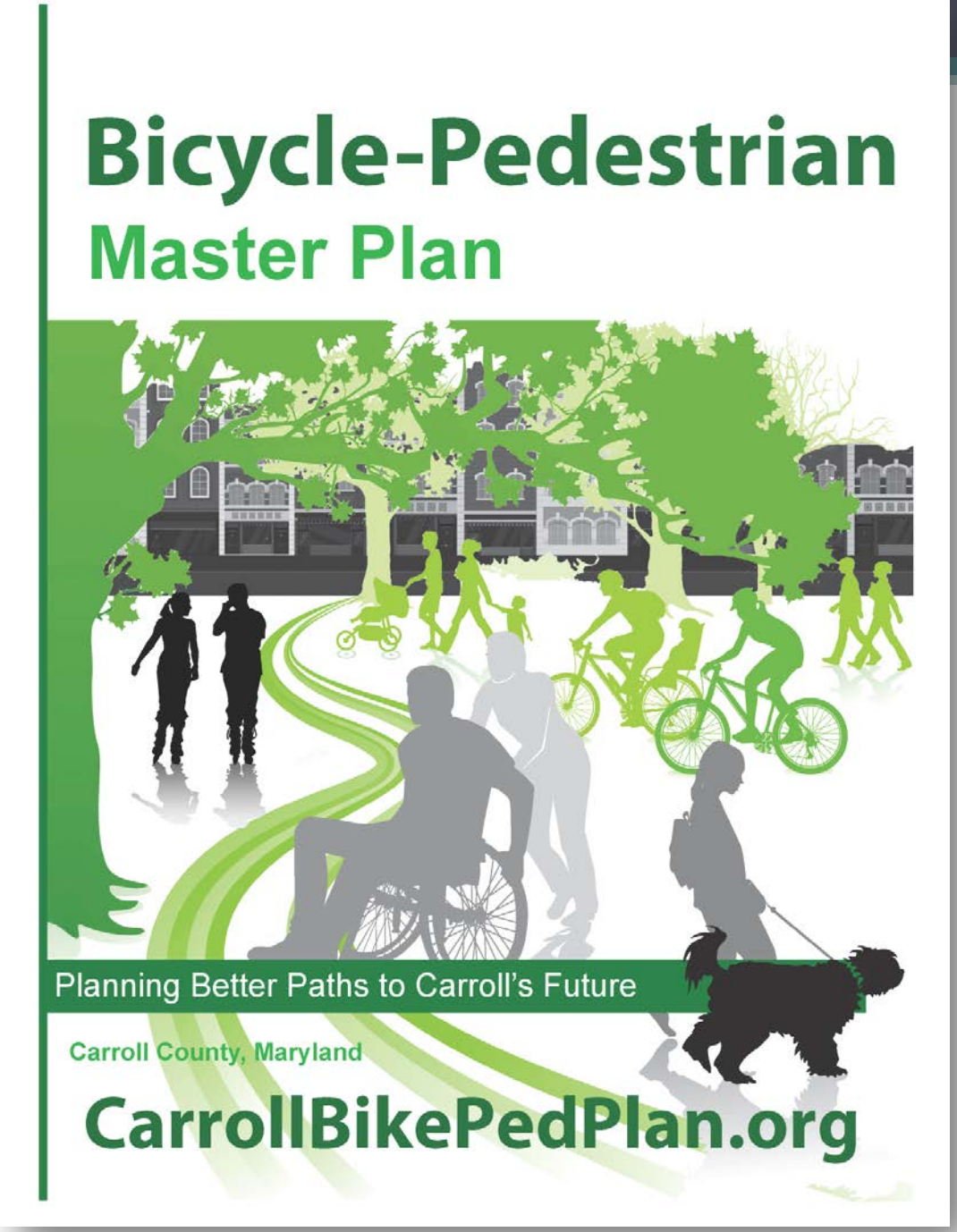


Bicycle-Pedestrian Master Plan: Chapter 7 Distribution

Planning & Zoning Commission
April 17, 2018

Overview

- Progress
- Sources
- Chapter 7: Design Alternatives and Safety
  - Goal
  - Findings
  - Recommendations
- Next Steps

Progress

Chapter	Title	Action
1	Introduction, Background, & Plan Development	June/July
2	Plan Vision & Goals	June/July
3	**Existing Conditions**	**In Progress**
4	**Future Connections**	**In Progress**
5	**Making Connections Beyond the Path**	**Accepted January 16, 2018**
6	Transportation Alternative	May Distribution
7	**Design Alternatives & Safety**	**Distributed 4/17/18**
8	Implementation Strategies & Funding Mechanisms	June Distribution

Sources

- County Sheriff/Municipal Police Crash Data
  - From Jan 1, 2012 to Aug 7, 2015
  - Originally presented Dec 2015
- State Police Vehicle Crash Data
  - From Jan 1, 2015 to Dec 31, 2017
- Maryland Manual on Uniform Traffic Control Devices (MD MUTCD). 2011 Edition
- SHA Bicycle Policy & Design Guidelines

Sources

- NACTO Urban Bikeway Design Guide (NACTO Guide), April 2011 Edition
- Small Town and Rural Multimodal Networks, December 2016 (FHWA)
  - Small Town and Rural Design Guide: Facilities for Walking and Biking

Chapter 7 Goal

- Goal 5:
  - Develop and construct bicycle and pedestrian facilities to effectively balance the needs of all transportation users to promote travel choices, ensuring that bicyclist and pedestrian needs are prioritized in appropriate locations and with safety in mind.

Chapter 7: Findings

Where do you walk in Carroll County?

71.2%	Paths of trails (including parks)
67.9%	Sidewalks
51.2%	Paved roads with no shoulders

Where do you bike in Carroll County?

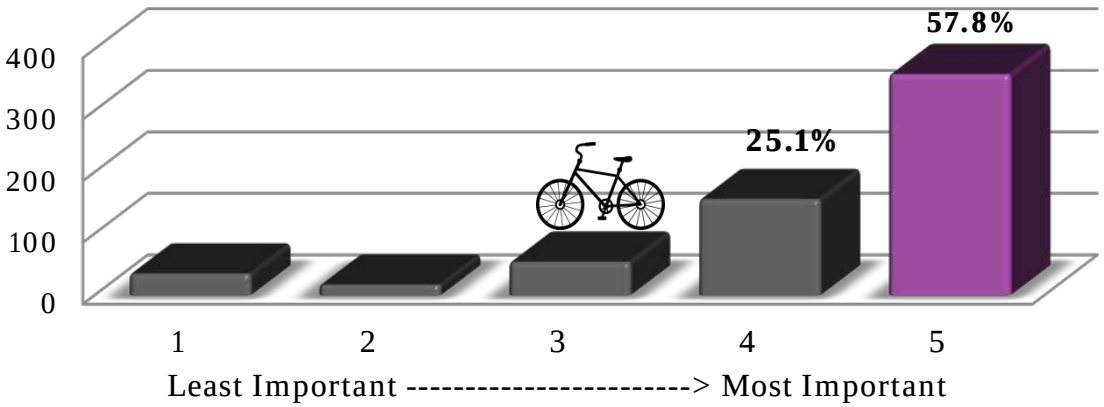
83.1%	Paved roads, low traffic, low speed streets areas
61.6%	Shoulders of paved roads
60.4%	Paths or trails

FACT: Bike-Ped Crashes

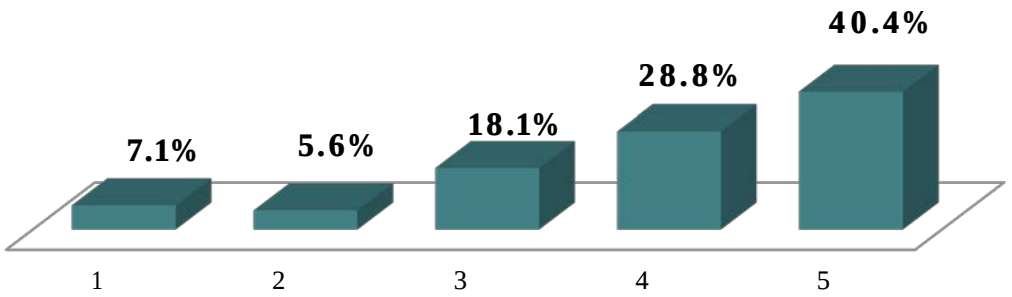
A crash involving a pedestrian is nearly six times as likely to produce a fatality as all traffic crashes statewide.

Motor Vehicle Administration

How Important is it for
Motorists to Respect Bicyclists
When Biking?



How Important is it for
Motorists to Respect Pedestrians
When Walking?



Chapter 7: Findings

FACT: Bike-Ped Crashes

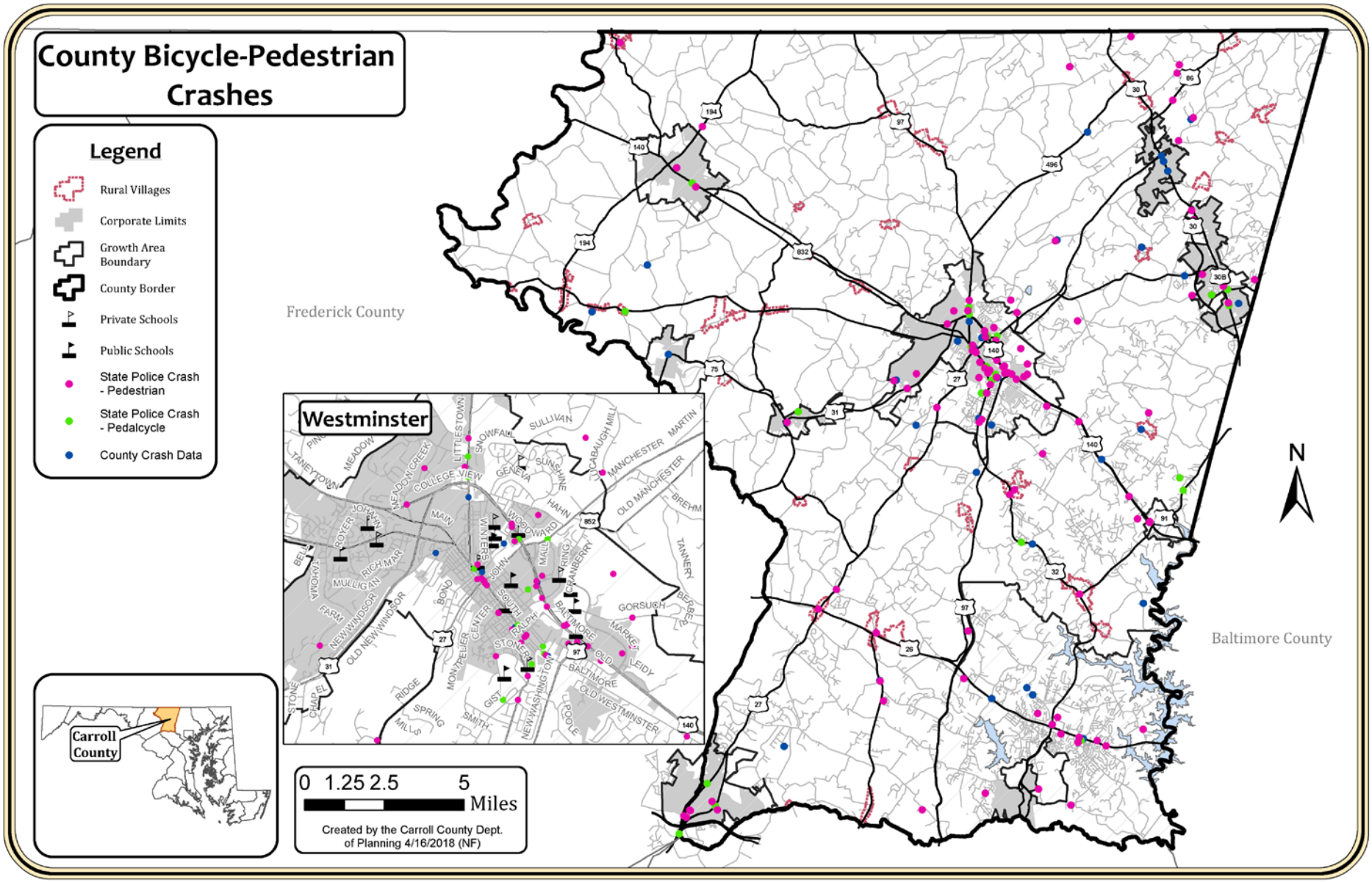
Rural crashes are more likely to occur at non-intersection locations.

FHWA

- Rural Crashes more likely to:
  - Have higher bicycle and pedestrian fatality rates
  - Have higher vehicle speeds
  - Have less roadway lighting
  - Have unpaved shoulders
  - More incidents at non-intersection locations
- Top rural pedestrian crash type:
  - walking along the roadway
- The top rural bicycle crash type:
  - turning/merging into the path of the driver
  - drivers overtaking the bicyclist
- Rural crashes are more likely to occur at midblock

Chapter 7: Findings

State Police Crash Data - Total	134	100.0%
Pedestrian Crashes	**109**	**81.3%**
Pedalcycle Crashes	25	18.7%
County Growth Area Total	98	73.1%
County Total Outside Growth Area	36	26.9%
% Crashes in Westminster MGA	60	44.8%
Baltimore Blvd (MD 140) in Westminster	13	9.7%
% of MD 140 crashes within MGA	**13**	**21.7%**
% Crashes in Freedom DGA	14	10.4%
Liberty Rd (MD 26)	4	3.0%


County Bicycle-Pedestrian Crashes
Legend
Rural Villages
Corporate Limits
Growth Area Boundary
County Border
Private Schools
Public Schools
State Police Crash - Pedestrian
State Police Crash - Pedalcycle
County Crash Data
Frederick County
Baltimore County
Westminster
Carroll County
0 1.25 2.5 5 Miles
Created by the Carroll County Dept. of Planning 4/16/2018 (NF)
N

Chapter 7: Findings

	Crash type	Solutions
Pedestrian:	**Pedestrians walking along the roadway**	Add sidewalks (targeted) Add paved shoulders Add roadway lighting (targeted)
	Pedestrians failing to yield midblock.	Educate pedestrians
	Pedestrians darting/dashing midblock	Improve signing (targeted) Educate pedestrians Utilize traffic-calming measures (targeted)
	Pedestrians failing to yield at the intersection	Educate pedestrians Install pedestrian signal (targeted) Improve roadway lighting (targeted)
	Pedestrians crossing the expressway	Improve roadway lighting (targeted) Install fence or barrier (targeted)

Chapter 7: Findings

	Crash type	Solutions
Bicycle:	**Bicyclists turning/merging into the path of the driver midblock**	Provide marked pavement space for bicyclists (locations with suitable pavement width) Add paved shoulder
	Drivers overtaking midblock	Provide marked pavement space for bicyclists (locations with suitable pavement width) Improve roadway lighting (targeted)
	Bicyclists failing to yield midblock	Reduce lane width to minimize crossing distance and slow vehicles (targeted)
	Bicyclists failing to yield at the intersection	Improve sight distance. Improve school zones

Chapter 7: Findings - Design

- Bicycle Lane
  - a portion of a roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs

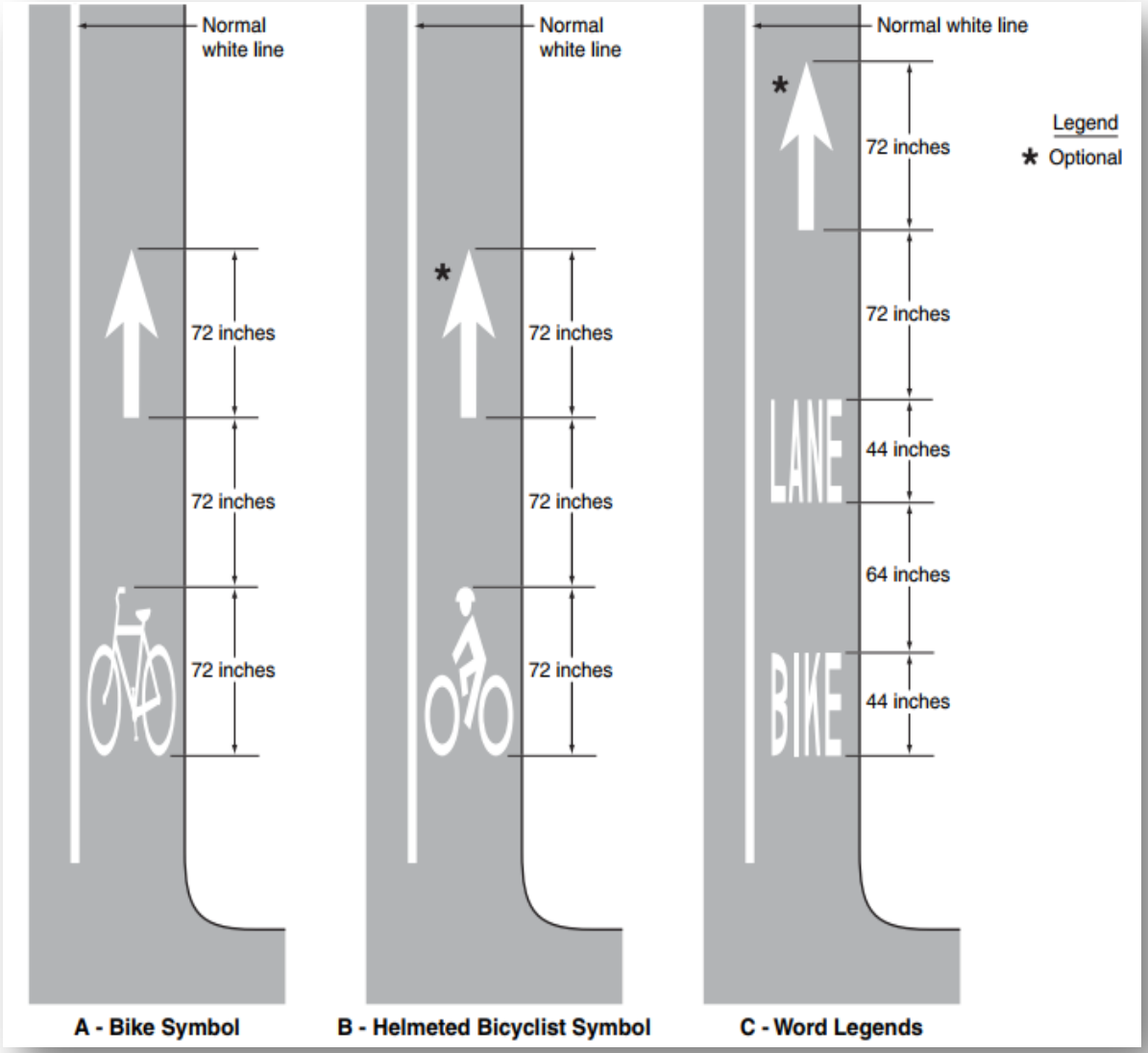


Figure 7-7: Examples of Bike Lanes, MD MUTCD p. 939

Chapter 7: Findings

Bicycle lanes over paved shoulder and wide outside lanes (design):	Bicycle Lanes can:
• **Provide dedicated space for bicyclists** • **Reduce wrong way bicycle riding** • **Encourage increased bicycle use** • **Increase motorist awareness of bicyclists** • **Encourage bicyclists to ride farther away from parked vehicles** • **Reduce motorist lane changes when passing bicyclists** • **Provide visual guidance to bicyclists navigating intersections**	• Increase bicyclist comfort and confidence on busy streets. Create separation between bicyclists and automobiles • Increase the predictability of bicyclist and motorist positioning and interaction • Increases total capacities of streets carrying mixed bicycle and motor vehicle traffic. Visually reminds motorists of bicyclists' right to the street.

Chapter 7: Findings

- Buffer-Separated Lane
  - A preferential lane or other special purpose lane that is separated from the adjacent general-purpose lane(s) by a pattern of standard longitudinal pavement markings that is wider than a normal or wide lane line marking.
  - The buffer area might include rumble strips, textured pavement, or channelizing devices such as tubular markers or traversable curbs, but does not include a physical barrier

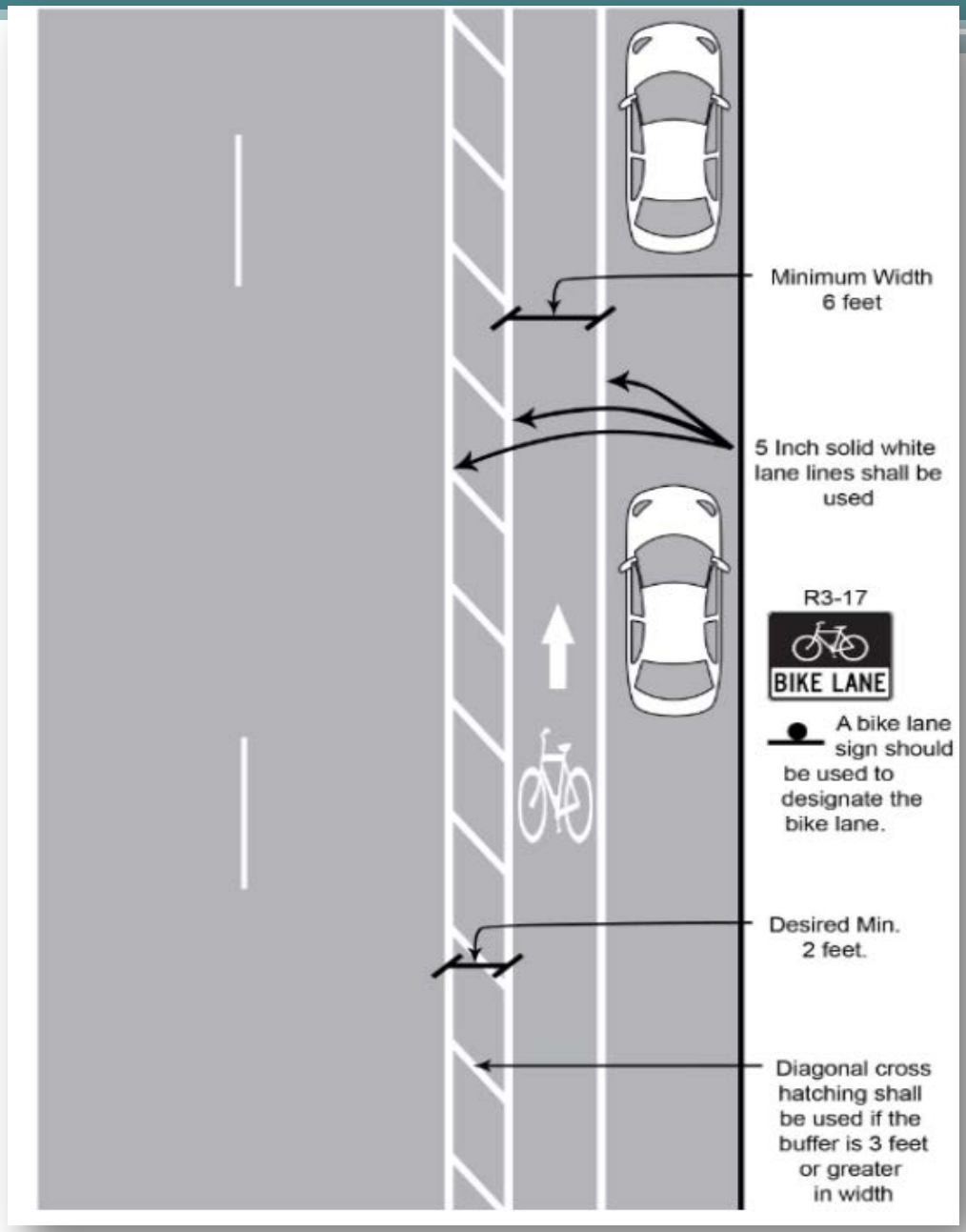


Figure 7-8: SHA Bicycle Policy & Design Guidelines, section 10.4

Chapter 7: Findings

- Advantages of Buffer-Separated Lanes

Buffer-Separated Lanes over Bicycle lanes (design):	Buffer-Separated Lanes can:
• **Provides greater shy distance between motor vehicles and bicyclists** • **Provides space for bicyclists to pass another bicyclist without encroaching into the adjacent motor vehicle travel lane** • **Encourages bicyclists to ride outside of the door zone when buffer is between parked cars and bike lane** • **Provides a greater space for bicycling without making the bike lane appear so wide that it might be mistaken for a travel lane or a parking lane**	• Appeal to a wider cross-section of bicycle users • Encourage bicycling by contributing to the perception of safety among users of the bicycle network.

Chapter 7: Findings

- Barrier-Separated Lane
  - A preferential lane or other special purpose lane that is separated from the adjacent general-purpose lane(s) by a physical barrier.
  - Common protected bike lane barriers include: jersey walls, parked cars, oblong low bumps, planters, delineated posts, raised curbs, bollards, vertical posts, fencing with gates, large rocks or boulders, and tree trunks.

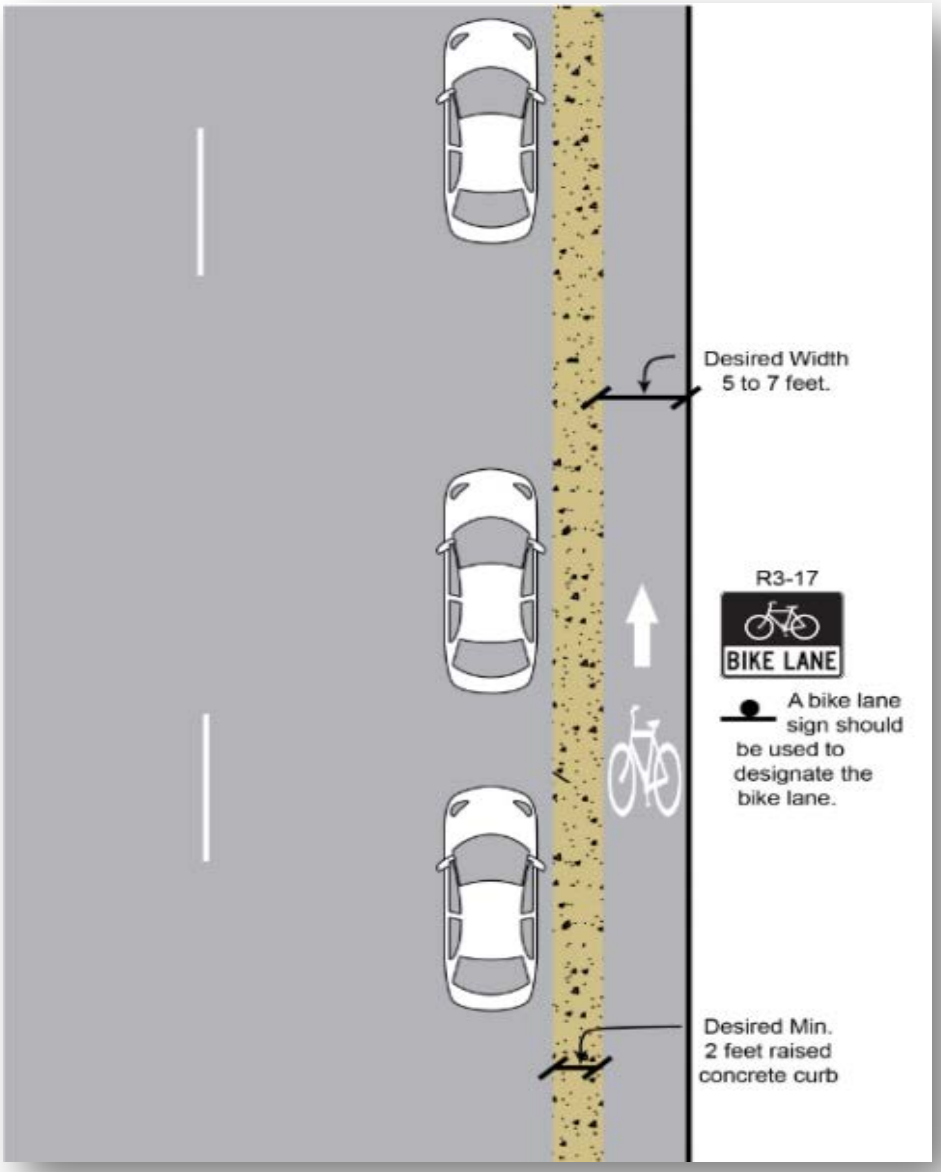


Figure 7-9: Barrier-Separated Bike Lane, SHA BP&DG section 10.2

Chapter 7: Findings

- Advantages of Barrier-Separated Lanes

Barrier-Separated Lanes over Buffer-Separated Lanes (design):	Buffer-Separated Lanes can:
• **"Provides a more comfortable experience on high-speed and high-volume roadways than on-road shoulders** • **Separated bike lanes offer bicyclists a similar riding experience to side paths but with fewer operational and safety concerns over bidirectional side path facilities** • **Offers an increased level of service over side paths in areas with high volumes of pedestrians, when paired with sidewalks.** • **Increases the degree of connectivity over a side path, when configured as a one-way directional facility on both sides of the street"**	• Appeal to a wider cross-section of bicycle users • Encourage bicycling by contributing to the perception of safety among users of the bicycle network. • Can reduce the incidence of sidewalk riding and potential user conflicts.

Chapter 7: Findings

- Refuge Island
  - are protected space placed in the center of the street to facilitate bicycle and pedestrian crossings.

Chapter 7: Findings

- Advantages of Refuge Island

Pedestrian Median Refuge Islands can:	
• **Allow pedestrians to more comfortably cross streets** • **Provide a protected space for pedestrians to wait for an acceptable gap in traffic**	• Reduce the overall crossing length and exposure to vehicle traffic for a pedestrian • Provide a protected space for pedestrians to wait for an acceptable gap in traffic


CHEVROLET
QUALITY FOODS
HANOVER, PA
belk
DICK'S


ONE WAY

Chapter 7: Recommendations

- Safety
  - Create a Strategic County Road Safety Plan based on 2016 – 2020 Maryland Strategic Highway Safety Plan.
    - This plan should include a Safety Awareness Campaign that targets driver awareness, bicycle and pedestrian safety, and road safety education, encouraging the appropriate safety practices when biking and walking

Chapter 7: Recommendations

- Safety
  - Working with the Carroll County Health Department to expand the SafeKids Program
  - Partnering with businesses to provide street lights
  - Create a way to gather input from users identifying hazards or facility repair needs (e.g. a crowdsourcing app)
  - Include safety guidelines as a part of a countywide Complete Streets policy

Chapter 7: Recommendations

- Design
  - Utilize best practices for safe crossings of state highways to destinations frequented by cyclists and pedestrians
  - Utilize best practices for bike-ped infrastructure along high speed roads (50+)
  - Incorporation bicycle and pedestrian accommodations into the County ADA Self-Evaluation and/or ADA Transition Plan

Chapter 7: Recommendations

- Design
  - Create a Complete Streets policy that designs for the safety of all County transportation modes
  - Update the *Design Manual for Roads and Storm Drains* and any other County transportation or road policy to include bike-ped accommodations
  - Include design guidelines as a part of a countywide Complete Streets policy

Next Steps

- Bike-Ped Picture Contest
  - people active on trails in Carroll County
- Chapter 6 – Transportation Alternative
- Chapter 8 – Implementation
- Chapters 1 & 2 – Introduction & Vision/Goals
- Final Draft (8 chapters)

Questions?

CarrollBikePedPlan.org

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