



A Statewide Policy Plan

April 2018

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Acknowledgments

DELDOT STAFF TEAM

Anthony Aglio

Jeff Niezgoda

Ann Gravatt

John Fiori

Paul Moser

SUPPORTED BY

Development of this plan was supported by the generous involvement of members of the *Blueprint for a Bicycle-Friendly Delaware* Working Group. Organizations involved include:

Bike Delaware

City of Wilmington Planning

Delaware Bicycle Council

Delaware Department of Education

Delaware Department of Transportation

Delaware Division of Parks and Recreation

Delaware Division of Public Health

Delaware Greenways

Delaware Greenways and Trails Council

Delaware State Police

Delaware Transit Corporation (DART First State)

Dover/Kent County MPO

Kent County

New Castle County Department of Land Use

Office of Highway Safety

Office of State Planning Coordination

Sussex County Planning Department

Sussex Cyclists

White Clay Bicycle Club

Wilmington Area Planning Council

PREPARED BY

Whitman, Requardt & Associates, LLP

Toole Design Group

Cover photo: Participants in Urban Bike Project's Youth Shop pose in the sculpture garden of the Delaware Art Museum. Credit: Krista Fowler, Urban Bike Project.

Letter from Leadership

Letter from Secretary Cohan



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
 800 BAY ROAD
 P.O. BOX 778
 DOVER, DELAWARE 19903

JENNIFER COHAN
 SECRETARY

BLUEPRINT for a BICYCLE FRIENDLY DELAWARE LETTER OF SUPPORT FROM SECRETARY COHAN

On behalf of the Department of Transportation I would like to thank the Statewide Bicycle Blueprint Planning Working Group for their interest and commitment to making our state more bicycle friendly. Our non-motorized systems provide a key element in the creation of a livable and vibrant Delaware. Nationally bicycle commuting has increased by 60% in the last decade, it has never been more important to realize its potential as part of the transportation system. With the creation of the Bike Plan we are poised to take advantage of the rising interest in cycling by creating better and safer bicycle networks that can be used more often by those living near schools, transit, parks, community centers and places of employment.

The 2017 Statewide Bicycle Plan, A Blueprint for a Bicycle Friendly Delaware, will help inform policies and investment strategies for promoting bicycling as a safe mode of transportation. The plan defines the vision and goals for encouraging bicycle transportation, provides an assessment of bicycle travel potential and refines the prioritization process for projects. The plan's recommendations are consistent with DelDOT's Vision to provide safe choices and seek the best value for every dollar spent. In addition the plans project prioritization process provides transparent measured evaluation of potential projects.

The plan emphasizes utilization of the latest most innovative bicycle design standards and guidance to assist planners and engineers in creating safe bicycle networks. Improvements to address bus interaction by improving connectivity awareness and end of trip bicycle facilities and educational programs that promote responsible bicycle operation as well as motorist education and responsibility will help increase the safety for all users.

This plan provides the frame work for a multi-agency approach in helping all people to experience a bicycle friendly Delaware.

Secretary Jennifer Cohan
 Delaware Department of Transportation

Date



Contents

The *Blueprint for a Bicycle-Friendly Delaware* consists of several documents and resources. These resources may be used together or separately by various stakeholders based on their interests and needs.

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Part 1

Plan Summary

I. Introduction

Delaware is consistently ranked as one of the most bicycle-friendly states in the nation. Thanks to significant investments in bicycle infrastructure, as well as the adoption of supportive policies, programs and public information campaigns (Figure 1-A), Delaware has been among the top of the League of American Bicyclists' Bicycle Friendly States program since 2009, rising as high as #3 in 2015 and 2016. This is a successful foundation upon which to build.

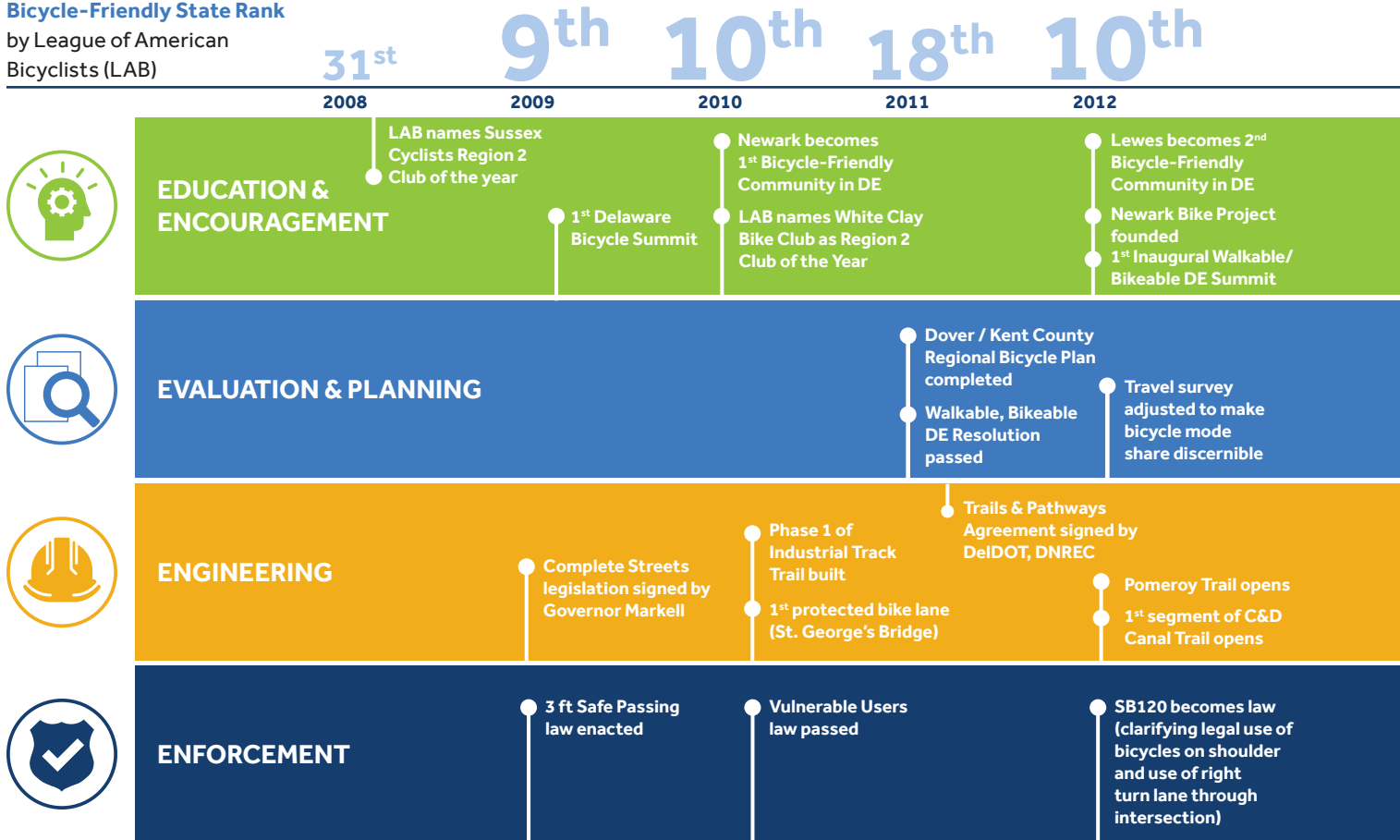
The *Blueprint for a Bicycle-Friendly Delaware* lays out a series of innovative strategies for planning, design, coordination and communication tools to continue this important work.



Figure 1-A

Delaware's Bicycle-Friendly Accomplishments Timeline

Bicycle-Friendly State Rank
by League of American Bicyclists (LAB)



II. Plan Purpose

The purpose of the *Blueprint for a Bicycle-Friendly Delaware* is to:

- Identify Delaware specific goals and adopt new and best practices
- Integrate efforts of stakeholders into a focused implementation strategy
- Increase coordination and leveraging of resources
- Communicate the value of bicycling toward achieving broad societal goals

This plan seeks to build on accomplishments to date, fill in the gaps, and take advantage of opportunities for improvements identified during stakeholder interviews.

Those opportunities include borrowing from national best practices, increasing transparency and formalizing policies and coordination practices, refining data collection and sharing practices, enhancing staff trainings, improving mapping resources, and establishing uniform planning and prioritization systems, project development and design practices, and facility selection guidance.



Photo Credits:
Delaware Public Archives;
Delaware Department of Transportation



III. Planning Process

The *Blueprint* is the result of a planning process that engaged the public, agency staff, and a wide range of stakeholders. The process was designed to define a broad, publicly driven vision and goals for bicycling; comprehensively evaluate the current situation and opportunities to enhance policies, programs, and processes that relate to bicycling; and then create a clear action plan to implement the recommendations informed by key stakeholders.

A project working group was established to represent the wide range of stakeholders committed to improving bicycling the Delaware. The planning team conducted in-depth interviews with additional stakeholders to understand current processes and explore potential recommendations. (See list of working group members and stakeholder interviews on pg. 5) Four public workshops were held to solicit community input. This process began in January 2017 and continued through early 2018. It is summarized in Figure 1-B.

Public Engagement

The first major step in the planning process was to hear from the public regarding their vision, priorities, and preferences for bicycling. Four public workshops were held in late February and early March 2017 to hear ideas from bicyclists of all skill levels and prospective bicyclists, as well as non-bicyclists. Two workshops were held in New Castle County, one in Kent County, and one in Sussex County. Public input was also welcomed by email, the project website, a public survey available online and in paper form at public workshops and through some project partners, and through a Wikimap site. Figure 1-B outlines the stakeholder engagement process and timeline.

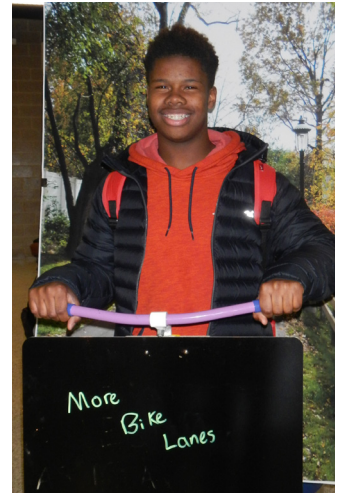
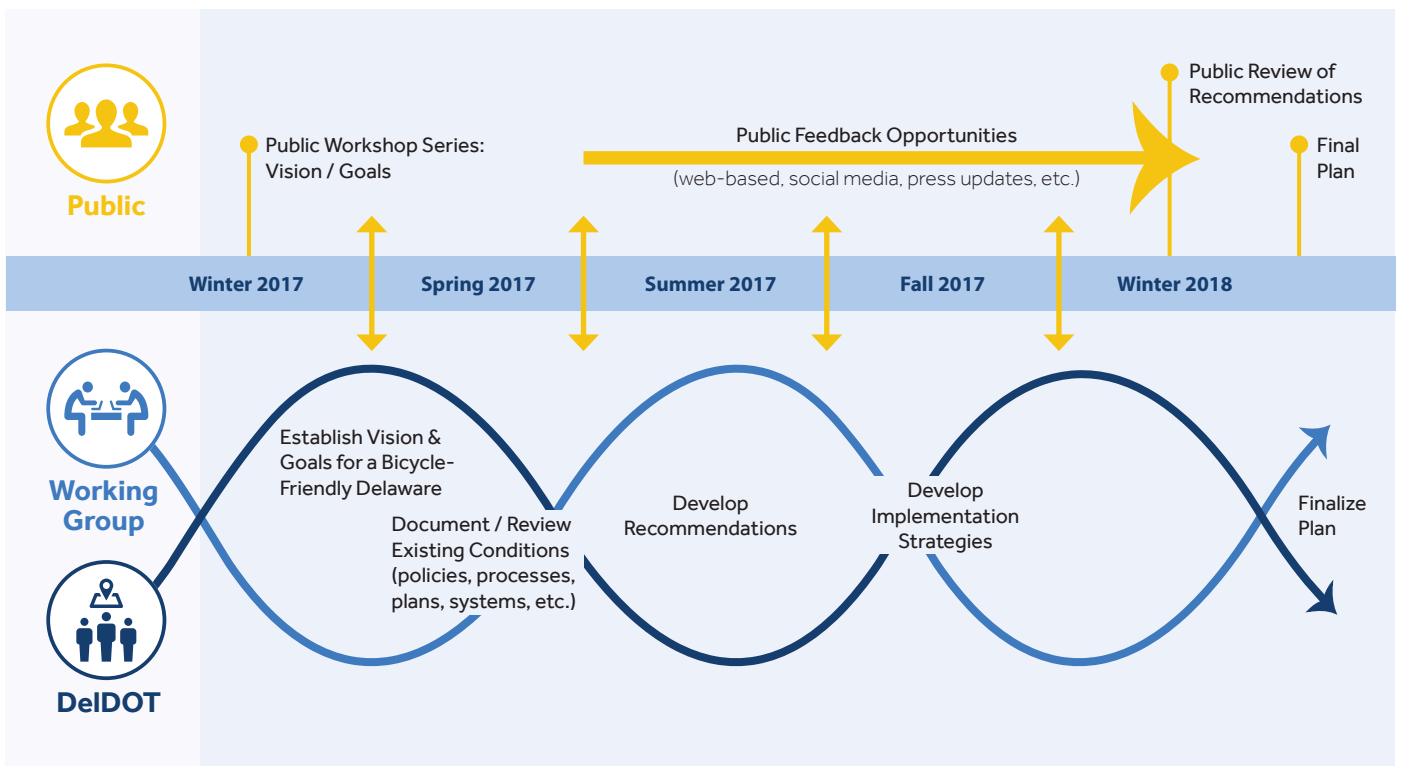


Figure 1-B



Working Group Members

Name / Affiliation	Blueprint Working Group	Delaware Bicycle Council	Key Stakeholder Interview
Alexis Walters, <i>Delaware Office of Small Business, Development, and Tourism</i>	X		
Alice Kirk, <i>City of Lewes</i>			X
Amy Anthony, <i>Delaware Division of Motor Vehicles</i>	X		
Ann Marie Townshend, <i>City of Lewes</i>			X
Anthony Aglio, <i>DeIDOT Planning</i>	X		X
Bob Ehemann, <i>Delaware Division of Parks and Recreation</i>			X
Brian Clarke, <i>DeIDOT Traffic</i>	X		
Brian Mitchell, <i>City of Wilmington Department of Public Works</i>			X
Bud Heberling, <i>Delaware State Police (former)</i>	X	X	X
D. Reed Macmillan, <i>Dover/Kent County MPO</i>	X		
Dave Curtis, <i>City of Wilmington Mayor's Office</i>			X
Derek Sapp, <i>DeIDOT Development Coordination</i>	X		
Drew Boyce, <i>DeIDOT Planning</i>			X
Fran Cardaci, <i>Public</i>	X	X	
Fred Breukelman, <i>Delaware Division of Public Health</i>	X	X	
Gregg Tulowitzky, <i>Delaware Department of Education (former)</i>	X	X	
Heather Dunigan, <i>WILMAPCO</i>	X		X
Herb Inden, <i>City of Wilmington Planning</i>			X
James Wilson, <i>Bike Delaware</i>	X	X	X
Janelle Cornwell, <i>Sussex County</i>	X		X
Jeff Greene, <i>Delaware Greenways</i>	X		X
Jeff Niezgoda, <i>DeIDOT Planning</i>	X		X
Jeff Whitmarsh, <i>Delaware State Police</i>	X	X	
John Fiori, <i>DeIDOT Planning</i>	X		X
Jon Husband, <i>New Castle County Dept of Special Services (former)</i>			X
Josh Thomas, <i>DeIDOT Planning</i>			X
JW Haupt, <i>White Clay Bicycle Club</i>			X
Karen Long, <i>Delaware Division of Public Health</i>	X		
Kate Layton, <i>Dover/Kent County MPO</i>	X		
Kayla Brennick, <i>Town of Delmar</i>			X
Krys Johnson, <i>City of Rehoboth Beach</i>			X
Leah Kacanda, <i>City of Wilmington Planning (former)</i>	X		X
Marcia Scott, <i>University of Delaware Institute for Public Administration</i>	X		
Marco Boyce, <i>New Castle County Department of Land Use</i>	X		X
Mark Luszczyk, <i>DeIDOT Traffic</i>	X		X
Mark Tudor, <i>DeIDOT Project Development</i>			X
Marty Lessner, <i>Council on Transportation</i>		X	
Mary Ellen Gray, <i>Kent County (former)</i>	X		
Matt Chesser, <i>Delaware Division of Parks and Recreation</i>			X

Name / Affiliation	Blueprint Working Group	Delaware Bicycle Council	Key Stakeholder Interview
Matt Harris, <i>City of Wilmington Planning</i>	X		
Matt Meyer, <i>New Castle County Administration</i>			X
Michael Krumrine, <i>Delaware Division of Parks and Recreation</i>	X	X	
Michael Wagner, <i>Department of Education</i>	X	X	
Michele Williams, <i>Sussex Cyclists</i>			X
Mike Fortner, <i>City of Newark</i>			X
Mike Simmons, <i>DeIDOT Project Development</i>			X
Mike Tyler, <i>Sussex Cyclists</i>	X	X	
Paul Moser, <i>DeIDOT Planning</i>	X		X
Rich Hall, <i>New Castle County Department of Land Use</i>			X
Rich Vetter, <i>Dover/Kent County MPO (former)</i>	X		X
Richard Klepner, <i>Office of Highway Safety</i>	X	X	X
Rob McCleary, <i>DeIDOT Transportation Solutions</i>	X		X
Roger Roy, <i>Public</i>	X	X	
Sarah Coakley, <i>DeIDOT Planning</i>	X		
Sarah Keifer, <i>Kent County</i>	X		X
Steve Bayer, <i>Office of State Planning Coordination</i>	X		
Thad McIlvaine, <i>DeIDOT Project Development</i>	X		
Thomas West, <i>City of Lewes</i>			X
Tom Felice, <i>DeIDOT Development Coordination</i>	X	X	
Tom Hartley, <i>Public</i>	X	X	
Tom Lawless, <i>DeIDOT Project Development</i>	X		
Tremica Cherry, <i>Delaware Transit Corporation</i>	X		
Walter Bryan, <i>Public</i>	X	X	
William Hardin, <i>Town of Delmar</i>			X

IV. Vision, Key Principles, Goals and Objectives

Vision

Everyone in Delaware has front-door access to a bicycle network that is safe, comfortable, and conveniently connected to places people want to go. A seamlessly integrated transportation and land use decision-making process, with many partners working together, encourages a culture where people choose bicycling in their daily lives for transportation, recreation, and improved health.

-The Blueprint for a Bicycle-Friendly Delaware working group

Key Principles



Safety

Bicycling in Delaware should be safe and be perceived as safe by all. Fear should not be a barrier to bicycling.



Network

Throughout the state the high quality bicycle network should provide comfortable routes for all types of bicyclists, including those with low tolerance for bicycling with automobile traffic, through a connected system of low-speed local roads, off-street trails, and on-street bicycle facilities. The term “low-stress bicycle network” is used throughout the *Blueprint* to reflect this principle.



Culture

Through partnerships among a wide variety of agencies, organizations, and officials, Delaware should have a transportation and social culture that supports bicycling as an enjoyable and widely accepted form of transportation and recreation. Public education and awareness campaigns, law enforcement strategies, and encouragement programs should promote a road culture of safe driving and a broader culture that sees bicycling as normal and desirable.



Transparency

The processes related to planning, funding, building, and maintaining bicycle facilities should be well-known and understood within DeIDOT, other state and regional agencies, and public stakeholder organizations.



Coordination

Internally, DeIDOT policies, standards, and hiring and training practices should support the development of a safe, comfortable, and connected bicycle network. Active coordination within DeIDOT and with other agencies and organizations should support a positive culture of bicycling. This requires good communication.



Equity

Bicycling should be an activity and travel mode available to an increasingly broad population. Bicycling is an opportunity to improve life outcomes for all Delawareans, especially traditionally underserved populations.

Goals and Objectives

Goal 1: Develop a Complete, Comfortable, Connected Bicycle Network

- 1.1 Increase the number of homes and destinations connected entirely by the low-stress bicycle network.
- 1.2 Increase bicycling comfort—Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.
- 1.3 Improve maintenance of shoulders, trails, and on-street bicycle facilities.
- 1.4 Increase regional and long-distance travel possibilities for bicycles.
- 1.5 Increase funding options and strategic partnerships for network investment.

Goal 2: Improve Bicyclist Safety and Confidence

- 2.1 Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails.
- 2.2 Improve non-motorized crash and injury data collection, analysis, and report dissemination to guide system and program improvements.

- 2.3 Reduce risk and perceived risk associated with bicycling, creating a reputation that Delaware is serious about protecting non-motorized/vulnerable users.

Goal 3: Foster a Culture of Bicycling that Benefits All Delawareans

- 3.1 Increase bicycle use through encouragement of bicycling as safe, convenient, affordable, and fun.
- 3.2 Increase awareness/understanding/coordination of statewide bicycle resources.
- 3.3 Increase number and distribution of bicycle organizations and events statewide to encourage bicycling for fun, fitness, and transportation.
- 3.4 Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DeIDOT and beyond.
- 3.5 Establish consistent, uniform, coordinated data gathering and management across agencies that leverages existing data and provides value to all interested stakeholders in their efforts to improve processes, systems, and programs.
- 3.6 Increase appreciation for and leveraging of bicycling and its broad benefits throughout Delaware.



Wilmington Bike to Work Day Event 2017

V. Implementation Strategies Summary

The following is a summary of implementation strategies that will help achieve each goal. For more details on each strategy, please see the full strategy matrix and information sheets in Part 2, beginning on page 19.

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

1.1 Increase the number of homes and destinations connected entirely by the low-stress bicycle network

- A-1. Level of traffic stress data integration
- A-2. Level of traffic stress analysis & planning
 - B. Land use strategy for bike/ped priority areas
 - C. Bicycle and transit integration policy
 - D. Statewide planning process that encourages local planning
 - E. Local project development and prioritization
 - F. Low-stress network connections through parks
 - G. Road diet corridor assessment
 - H. Neighborhood connectivity policy
 - I. DeIDOT ROW/Paper streets assessment

1.2 Increase the amount of the bicycle network (streets & paths) that is safe and comfortable for all ages and abilities

- A. Streamlined process for straightforward projects
 - B-1. Context-specific bicycle facility design guidance
 - B-2. Complete streets implementation strategy
 - B-3. Design guidance revisions for capital projects
 - B-4. Developer design guidance revisions
 - B-5. Developer design guidance revisions
 - B-6. Developer design guidance revisions
 - C-1. Bicycle route signage
 - C-2. Guide for local wayfinding
 - D. Roadway lighting guidance for bicycling
 - E. Sidepath access management policy and guidance

1.3 Improve maintenance of shoulders, trails, and on-street bicycle facilities

- A. Statewide maintenance plan and policies
- B. Online maintenance request map
- C. Work zone accommodations

1.4 Increase regional and long-distance travel possibilities for bicyclists

- A. Bicycle trip-planning app
- B. Transit/bicycle routes & coordination

1.5 Increase funding options and strategic partnerships for network investment

- A. Resources for local planning
- B. Private-public funding processes
- C. Strategic partnerships for using easements



Castle Trail at St. Georges Bridge.

Goal 2. Improve Bicyclist Safety and Confidence

2.1 Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails

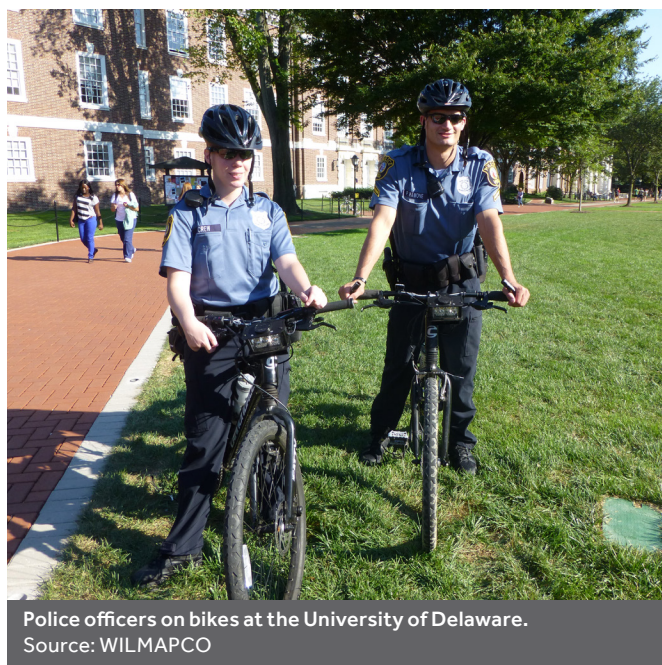
- A. Comprehensive education strategy & program
- B. Expand targeted education/enforcement strategy
- C. Driver's education content on bicycle safety and safe driver training
- D. Bicycle content in professional driver's training
- E. Public safety campaigns
- F. Police training update

2.2 Improve non-motorized crash and injury data collection, analysis, and report dissemination to guide system and program improvements

- A. Annual analysis of crash reports
- B. Crash data accuracy analysis and improvements

2.3 Reduce risk and perceived risk associated with bicycling, creating a reputation that Delaware is serious about protecting non-motorized/vulnerable users

- A. Strategic highway safety plan update
- B. Safety focused policy and processes in priority areas
- C. Bicycle safety statistics report
- D. Bicycle safety laws review



Police officers on bikes at the University of Delaware.
Source: WILMAPCO

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

3.1 Increase bicycle use through encouragement of bicycling as safe, convenient, affordable, and fun

- A. Bicycle-friendly communities and businesses
- B. Community programs to increase bicycle access
- C. Individualized marketing and targeted outreach
- D. End-of-trip facilities (fix-it stations, showers, bike parking)

3.2 Increase awareness, understanding, and coordination of statewide bicycle resources

- A. Website for bicycling resources
- B. *Blueprint* toolkit distribution
- C. Local maps distribution
- D. Plan for new technologies and automated vehicles
- E. Bicycle/pedestrian count program
- F. Monitoring and encouragement of *Blueprint* implementation
- G. Diversity of Delaware Bicycle Council

3.3 Increase number and distribution of bicycling organizations and events statewide to encourage bicycling for fun, fitness, and transportation

- A. Event coordination and promotion
- B. Resources & incentives for bicycle-supportive groups
- C. Expand mobile bike repair and safety programs

3.4 Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DeIDOT and beyond

- A. Formal training opportunities
- B. Count program partnerships
- C. *Blueprint* incorporation in state and local plans
- D. Living laboratory research program

3.5 Establish consistent, uniform, coordinated data gathering and management practices across agencies

- A. Data collection consistency
- B. Bicycle-on-transit data collection
- C. Bicycle/Ped data collection in project development
- D. Bicycle performance measures

3.6 Increase appreciation for and leveraging of bicycling and its broad benefits throughout Delaware

- A. Return on investment report
- B. Incorporation of bicycle goals in other plans and policies



Trailhead facilities at St. Georges.

VI. Performance Measures

Bicycle-Friendly Delaware Performance Measures

What gets measured is what gets done. The purpose of performance measures is to establish baseline data and targets to measure what matters for improving bicycling in Delaware. To fully understand progress and to serve as important feedback to stakeholders, measures should be used that reflect progress toward the plan vision as well as its individual objectives. Performance measures must be based on available information, measure what is important, and be comprehensible to a broad audience. Important considerations for performance measures include:

- Availability of data
- Quality of data
- Consistency in methodology/data over time

- Robustness of measure
- Ease of understanding by non-technical experts
- Ability to regularly collect and report data¹

DeIDOT currently uses miles of bike lanes and trails added per year along with crash data as primary benchmarks to measure progress. While these are important figures, they only reflect some of the progress toward the overall vision, goals, and objectives of the *Blueprint*.

Overall performance measures

The *Blueprint's* performance measures, summarized in Table 1, aim to broadly reflect progress toward the plan's desired outcomes. Additional measures specific to individual plan objectives have been examined and should be considered for inclusion. (As plan recommendations are implemented over time, measurement will increase.)

Table 1: Performance Measures Summary

Measure	Source(s) of data	Data Manager	Data consistently /regularly collected?	Data Collection		
				Baseline Measure	Baseline Year	Baseline Source
Fatalities	DelJIS, CARS database, FARS database	DeIDOT Safety, OHS	Yes	3 people	2016	DSP 2016 Traffic Statistical Report
Personal injuries	DelJIS--CARS database	DeIDOT Safety, OHS	Yes	108 people	2016	DSP 2016 Traffic Statistical Report
Percent of population or households participating in bicycling of all types	Statewide Comprehensive Outdoor Recreation Plan (SCORP) Survey (might also consider BRFS)	DNREC, Parks	Yes	53% of households	2016	DNREC State Parks
Mode share	DTMS, American Community Survey	DeIDOT, OSPC	Yes	1.2% of commuters	2016	ACS, 2012-2016 (5 year estimates), Table B08134
Trail user volumes (average annual weekly) at specified count locations	Permanent counters; Castle Trail (Lift Bridge); Capital City (Archives Building); J & B Trail (Shofield Development)	DeIDOT	Yes	4,924 Trail users per week	2016	Eco-Visio data site

¹ Adapted from FHWA's Guidebook for Developing Pedestrian and Bicycle Performance Measures, March 2016



Part 2

Implementation Plan

I. Introduction and Plan Framework

Providing a safe, comfortable, connected bicycle network, supportive facilities, and links to popular destinations is central to achieving the vision established in the *Blueprint for a Bicycle-Friendly Delaware*.

With that in mind, the recommendations in this strategic implementation plan prioritize:

- ★ **Network Development:** Creating local plans that identify the desired bicycle network.
- ★ **Project Prioritization and Funding:** Identifying and prioritizing projects that expand the low-stress bicycle network.
- ★ **Project Development and Design Guidance:** Designing and constructing facilities that extend the bicycle network and produce a safer, more comfortable experience for bicyclists and other users.

The following components support the three priorities above:

- **Data and Evaluation:** Providing relevant performance measures to all components of the plan help identify where further improvements can be made.
- **Land Use and Transportation Integration:** Land use and development patterns influence the desirability of bicycling as a mode of transportation both by influencing how transportation systems are designed and the extent to which destinations are accessible by bicycle.
- **Education and Training:** Building awareness of rules, procedures, and resources helps create a context where bicycling is easier, safer, and more enjoyable.
- **Enforcement:** Enforcing laws helps improve safety, perceptions of safety, and comfort of bicyclists and other travelers, making bicycling more appealing.
- **Encouragement:** Programs, events, and other incentives inspire more bicycling.

An additional theme that runs throughout the *Blueprint* strategies is communication and coordination. One of the most important tactics for achieving the goals of the plan is broadening the coalition of agencies, organizations, stakeholders, and other entities that are invested and actively participating in supporting and

improving bicycling in Delaware. This is accomplished, in large part, through active communication and information sharing with existing and potential partners. Strategies related to communication and coordination are woven throughout the recommendations.

The priorities and framework for strategic implementation, described above, is depicted on page 15 (Figure 2-A).

6 Framework Categories

The recommended strategies are organized based on their corresponding *Blueprint* Goal and Objective. They are listed on page 19. Each one also falls into one or more of the following framework categories, useful for organizations to identify strategies associated with their work:

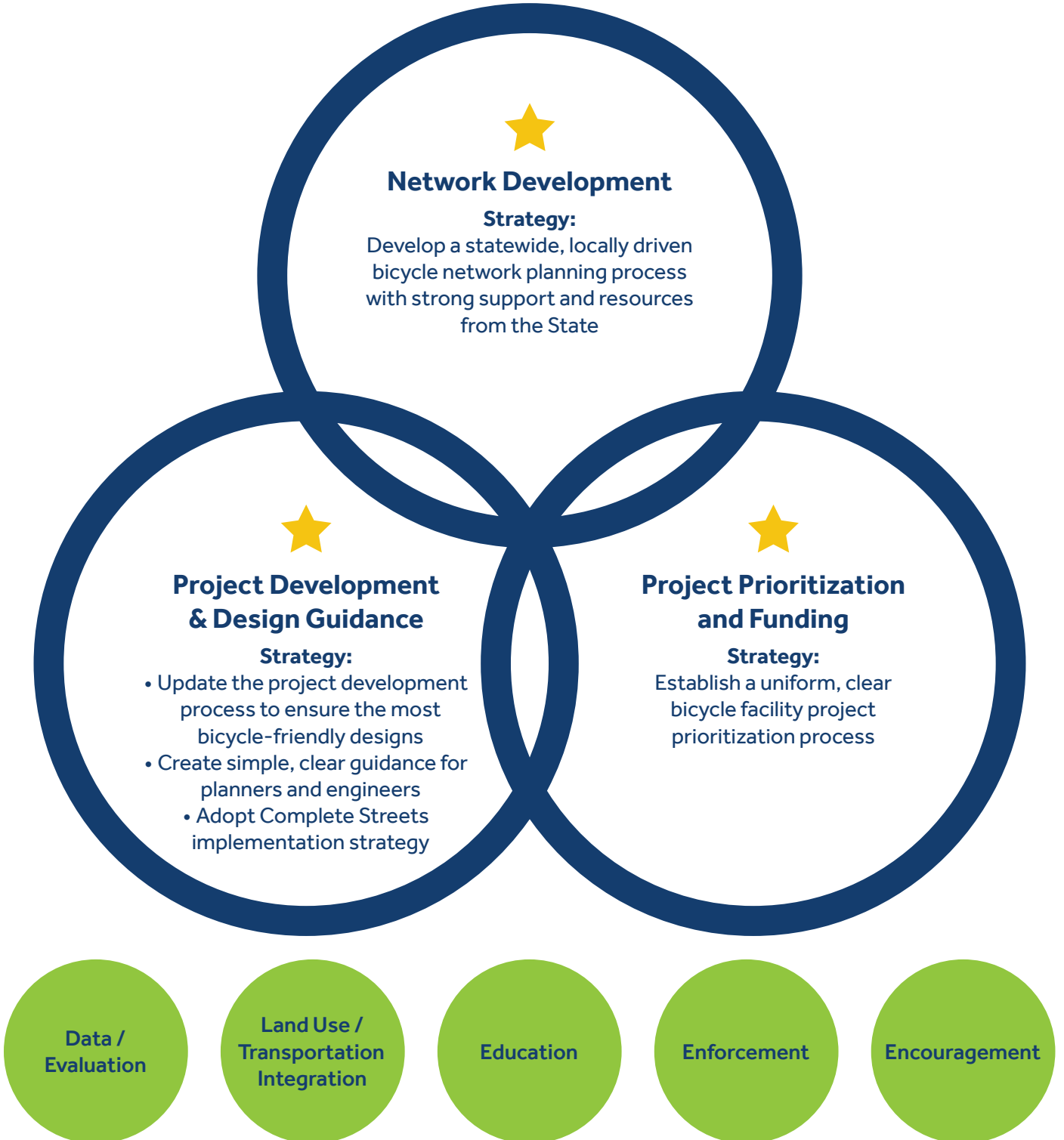
1. **Network Development**
2. **Prioritization and Funding**
3. **Project Development and Design**
4. **Data and Evaluation**
5. **Land Use and Transportation Integration**
6. **E3 - Education / Training, Enforcement, and Encouragement**

A spreadsheet of the Blueprint recommendations is available for sorting by these framework categories as well as other characteristics.

Figure 2-A

Strategic Implementation Plan Framework

★ Core Recommendation



II. Strategic Approach

As described above, the core of the Blueprint is built around network development, project prioritization, and project development and design guidance. This is supported by data and evaluation, land use and transportation integration, education and training, enforcement, and encouragement. It is all tied together through communication and coordination. The Blueprint recommends several dozen specific strategies within that framework to achieve the plan’s goals.

The strategies are intended to be implemented by a range of partners in various organizations at the state, regional, and local levels. They can be undertaken over the next several years and can build upon one another. Because work is shared across many agencies, each organization should be able to undertake their responsibilities with a reasonable level of time and resources.

The *Blueprint* strategies are interconnected and support one another, and as such, should be implemented in a coordinated fashion. Initial strategies to pursue should be selected based on the *Blueprint*’s critical priorities and immediate opportunities (see “timeframe and priority” information in the strategy matrix and info sheets below). A spreadsheet of recommendations is available through the DeIDOT website; it contains characteristics for each recommendation including implementation timeframe, priority, and framework category, which can be used by

stakeholders to quickly identify highest priorities and most relevant recommendations to their organization.

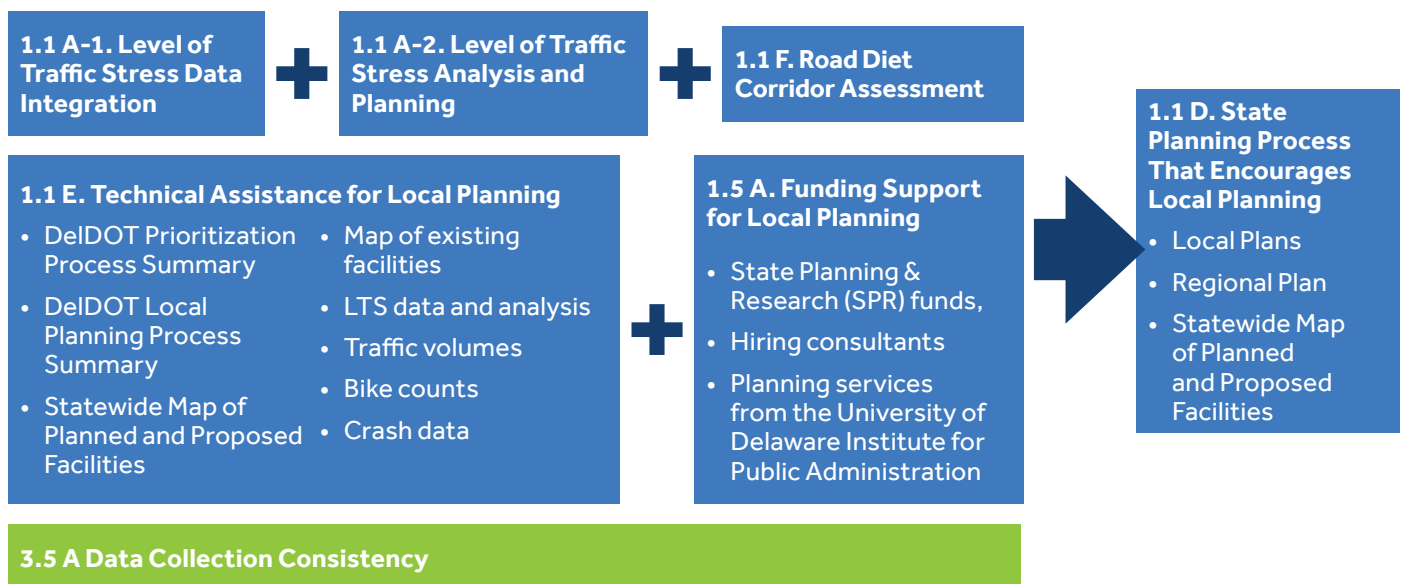
The following four examples illustrate how the recommended strategies interrelate.

Example 1: Network Development

Planning, Analysis, and Funding

As one of the central planning framework elements, low-stress bicycle network planning includes several strategies that work together. DeIDOT is currently refining its Level of Traffic Stress analysis (1.1 A-1). This will be applied to bicycle system planning and evaluation throughout the state (1.1 A-2). Other assessments may be conducted. For example, DeIDOT will complete an analysis of potential road diet corridors where space could be made available for on-street bicycle facilities (1.1 F). These steps feed into the information that DeIDOT will provide to local governments (1.1 E) – along with planning capacity resources (1.5 A) – to support local planning efforts. All of this comes together to result in a locally-driven planning process where projects filter up from the local level to the regional level. They are then included in a statewide map of planned and proposed bicycle facilities (1.1 D).

Example 1: Network Development



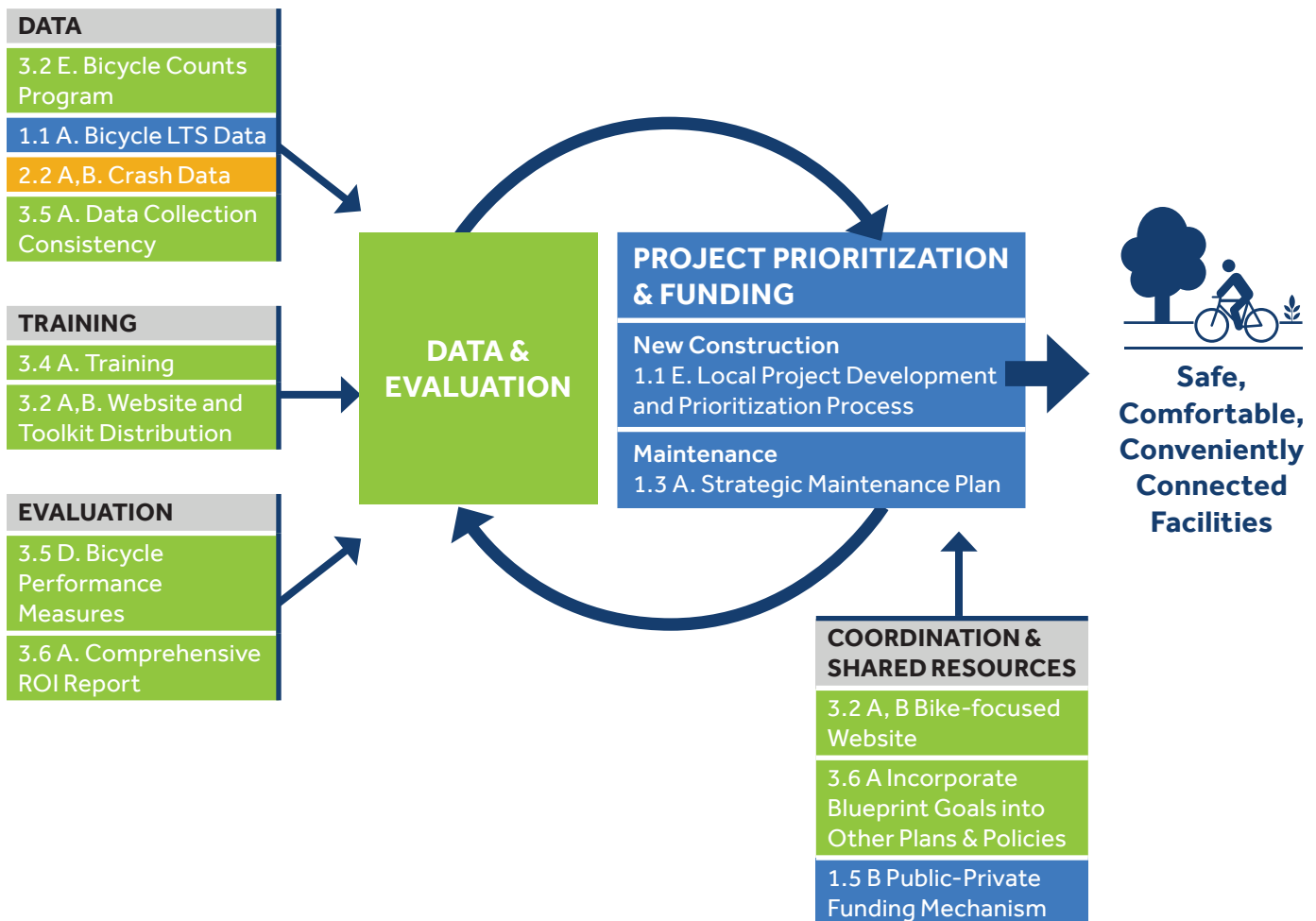
Example 2: Prioritization and Funding

With limited funding for bicycle infrastructure, it is important to leverage resources toward building facilities that will provide maximum value for the public.

Included in this *Blueprint* is a prioritization process specific to Delaware’s Statewide Bicycle and Pedestrian Program funding pool that will maximize progress toward the Plan’s vision of “a bicycle network that is safe, comfortable, and conveniently connected to places people want to go.” The specifics of that prioritization process are explained in detail in Part 3: Toolkit, starting on page 91.

The prioritization for the Statewide Bicycle and Pedestrian Program (and for many other funding sources that can be used toward construction of bicycle facilities) is based on data and evaluation. The effectiveness of the prioritization and outcomes relies greatly on the quality of data and evaluation. Example 2, below, illustrates how the integration of recommended strategies will support the aforementioned goal of maximizing the extent of a safe, comfortable, conveniently connected bicycle network.

Example 2: Prioritization and Funding



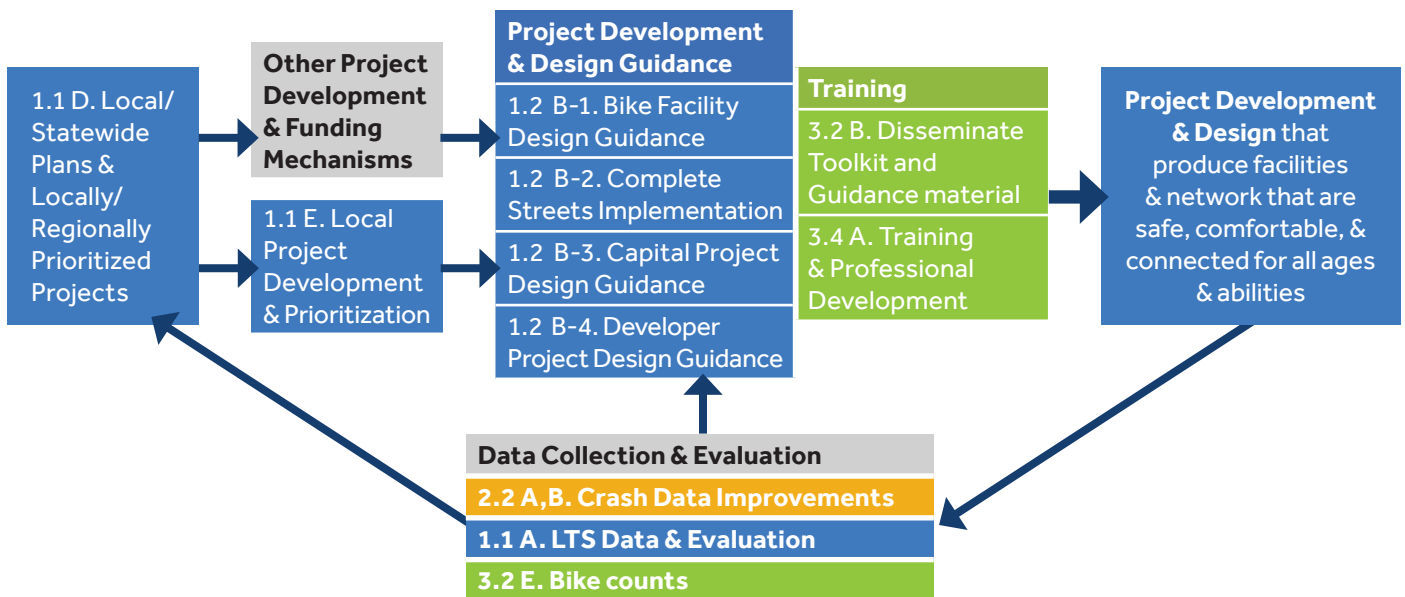
Example 3: Project Development and Design

The *Blueprint* contains strategies related to project development. Projects that are generated through the local planning process are prioritized by DeIDOT Planning (1.1 E) and implemented by DeIDOT Planning and Transportation Solutions (DOTS) (1.2 B). Bicycle components are incorporated into larger road projects as part of the Complete Streets implementation strategy (1.2 B-2). Bicycle facilities are selected based on context-specific guidance to create low-stress bicycle conditions (1.2 B-1). The design of the facility will be made using the most current design guidance (1.2 B-3). Projects in private developments will follow the revised developer design guidance (1.2 B-4).



Crew installing shared lane markings in Newark. Source: WILMAPCO

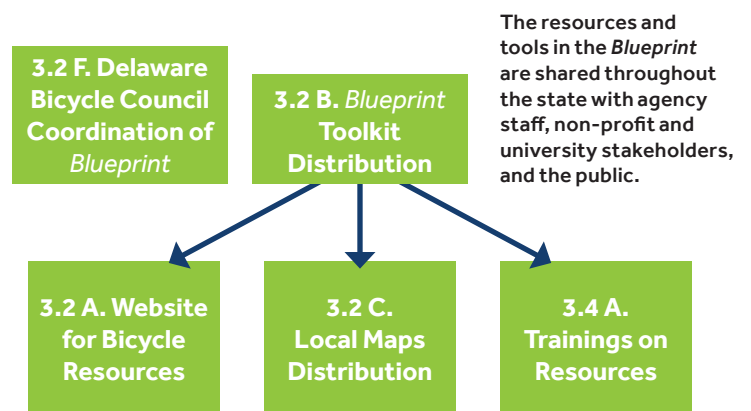
Example 3: Project Development & Design



Example 4: Communication and Coordination

Communication and coordination are critical elements in the successful implementation for the *Blueprint*. The Delaware Bicycle Council plays a key role in coordinating partners, tracking process, and maintaining ongoing support for the plan (3.2 F). The resources and tools in the *Blueprint* should be shared throughout the state with the agency staff, non-profit and university stakeholders, and the public through a statewide website (3.2 A), maps (3.2 C), and trainings (3.4 A).

Example 4: Communication and Coordination



III. Strategic Implementation Plan

“Timeframe” indicates the time needed to complete the task once initiated. Initiation of the recommendation will be based on staff resources and the Priority. The ★ identifies a core recommendation.

Goal 1: Develop a Complete, Comfortable, Connected Bicycle Network

Recommendation	Timeframe	Priority
1.1 Increase the number of homes and destinations connected entirely by the low-stress bicycle network		
A-1. Complete bicycle LTS data collection/refinement and integrate into GIS and bicycle travel model	1–2 years	High
A-2. Integrate the low traffic stress approach and data in network and system planning and evaluation	1–2 years	High
B. Establish/implement an integrated and targeted land use and transportation development and re-development strategy that improves safety for non-motorized and transit users (coordinated between DeIDOT and local jurisdictions, with emphasis on low-stress connectivity for bicyclists)	3–5 years	High
C. Establish policies and processes to ensure transit and bicycle networks complement each other	1–2 years	Moderate
D. ★ Establish a statewide bicycle network planning process that encourages local plan development with support and resources from the State, and includes development of routes of Statewide Significance	<1 year	High
E. ★ Provide technical assistance/guidance to local and county-level governments for the development of local project prioritization. Establish a statewide system to solicit local and regional priorities and select projects for state funding. Vet locally and regionally identified projects for implementation feasibility.	<1 year	High
F. Evaluate and identify opportunities to create critical low-stress connections through existing park land	1–2 years	High
G. Conduct a comprehensive road diet assessment to proactively identify opportunities for bicycle facility expansion/improvement	<1 year	High
H. Explore strengthening neighborhood connectivity policy, including offering incentives for local street connectivity	3–5 years	Moderate
I. Assess DeIDOT Rights of Way (paper streets) to identify connection opportunities	<1 year	Moderate
1.2 Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities		
A. Establish a streamlined process for simpler projects that have minimal impacts	1–2 years	Moderate
B-1. ★ Create simple and clear guidance for planners and engineers, oriented toward expanding the low-stress, connected network (bicycle facility design guide with typical section details and guidance that reflects Delaware’s unique contexts—rural, suburban, urban—and preferences)	<1 year	High

B-2. ★ Adopt a Complete Streets implementation strategy that includes full integration of policies into design manuals	<1 year	High
B-3. Review and revise, as necessary, design guidance for DelDOT capital projects to ensure bicycle-friendly design elements, such as street trees and narrower roadway widths, are achievable (especially on priority bicycle routes). This includes, but is not limited to, the Road Design Manual and Plan Development Checklist.	1–3 years	High
B-4. Review and revise, as necessary, design guidance for developer projects subject to DelDOT review to ensure bicycle-friendly design elements, such as street trees and narrower roadway widths, are achievable (especially on priority bicycle routes). This includes, but is not limited to, the Development Coordination Manual.	1–3 years	High
B-5. Aggregating local and regional plans, create a bicycle network master plan. Identify top priority segments in the plan. Report regularly to the Delaware Bicycle Council on significant changes to the plan.	1–2 years, ongoing	High
B-6. Provide regular updates to the Delaware Bicycle Council on significant bicycle network project development milestones.	1–2 years, ongoing	High
C-1. Establish common bicycle route signage	1–2 years	High
C-2. Establish a guide for local entities to facilitate safe, easy navigation	1–2 years	Low
D. Add bicycling considerations to roadway lighting guidelines (emphasis on high-priority routes and crossing locations)	<1 year	High
E. Establish and apply access management policies and design guidance for dealing with sidepath and motor vehicle interactions	3–5 years	Moderate
1.3 Improve maintenance of shoulders, trails, and on-street bicycle facilities		
A. Develop a statewide strategic maintenance plan and policies specific to bicycling	2–3 years	Low
B. Establish a streamlined, online, map-based maintenance request process to hasten repairs and improve coordination	3–5 years	Low
C. Ensure work zone accommodations continue to be sufficient for bicyclists	<1 year, ongoing	High
1.4 Increase regional and long-distance travel possibilities for bicyclists		
A. Improve bicycle trip-planning app (to include recreation/tourism oriented component, like gophillygo.com) that emphasizes longer distances and regional travel possibilities	1–2 years	Moderate
B. Coordinate bicycle network development with transit planning for regional and long-distance travel	3–5 years	Moderate
1.5 Increase funding options and strategic partnerships for network investment		
A. Direct resources and assistance to local and county governments to support local network planning	1–2 years	High
B. Define processes for leveraging/applying private funds for bicycle infrastructure	2–3 years	High
C. Develop strategic partnerships for using easements	1–3 years	High

Goal 2: Improve Bicyclist Safety and Confidence

Recommendation	Timeframe	Priority
2.1 Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails		
A. Develop and implement a phased public education/training strategy that includes a comprehensive educational program to address travel and safety through all life phases and needs (all ages, all modes)	1–10 years	Moderate
B. Expand the targeted education and enforcement strategy currently used in some Delaware communities	1–2 years	Moderate
C. Include bicycle safety in driver's education and testing and use incentives for bicycle-focused safety in safe driver training	1–3 years	High
D. Improve education and training of professional drivers (e.g. bus drivers, truck drivers, emergency responders, law enforcement) regarding bicycle interactions	3–5 years	Low
E. Implement targeted, evidence based public safety campaigns toward safety for bicyclists, including communicating laws and expectations through various media (e.g. VMS, yard signage, PSAs, social media)	1–2 years	Moderate
F. Review and update police training and enforcement statewide and across jurisdictions to result in safer bicycling and driving, but not reduced bicycling; include distracted driving/riding	3–5 years	Moderate
2.2 Improve non-motorized crash and injury data collection, analysis, and report dissemination to guide system and program improvements		
A. Annually analyze all police reports for serious and fatal bicycle crashes and integrate with past annual crash reports. Highlight patterns and make recommendations regarding countermeasures	1–3 years	High
B. Identify errors that might be introduced into non-motorized crash data and analysis (collection, querying, application, reporting steps); establish and implement processes / best practices for data accuracy and its application	1–2 years	Moderate
2.3 Reduce risk and perceived risk associated with bicycling, creating a reputation that Delaware is serious about protecting non-motorized/vulnerable users		
A. Update the Strategic Highway Safety Plan (next update: 2020) to more fully incorporate a proactive safety approach for bicycling. For the SHSP, expand the Emphasis Area: Making Walking and Street Crossing Safer to more generally include "active transportation"	2–3 years	High
B. Establish a process whereby priority bicycle (and pedestrian) areas are identified and used to inform development and application of policy and processes that can best enhance bicycle (and pedestrian) safety and comfort	2–3 years	Moderate
C. Regularly publish statistics on bicyclist safety	<1 year	Moderate
D. Annually review and update laws and enforcement practices to protect vulnerable users	3–5 years	Low

Goal 3: Foster a Culture of Bicycling that Broadly Benefits Delawareans

Recommendation	Timeframe	Priority
3.1 Increase bicycle use through encouragement of bicycling as safe, convenient, affordable, and fun		
A. Increase the number of bicycle-friendly communities and businesses	1–2 years	Moderate
B. Expand programs/relationships with community organizations to get bicycles to people (e.g. Establish fleet of bikes for State workers / legislators, Bike Share programs, Build-A-Bike Program, etc.)	1–2 years	Moderate
C. Build awareness of bicycling, active transportation, and related resources among the public through targeted information dissemination and outreach	1–2 years	Moderate
D. Increase end-of-trip facilities (public and private) along routes and at destinations, including: showers, fix-it stations, camping, conveniently located and safe bicycle parking, etc.	1–2 years, ongoing	Moderate
3.2 Increase awareness/understanding/coordination of statewide bicycle resources		
A. Develop a centralized, easy-to-use bicycle-focused website to serve all stakeholders	<1 year	High
B. Create and disseminate <i>Blueprint</i> toolkit materials and hold trainings and educational opportunities for stakeholders to learn about the latest resources, processes, and activities	<1 year, ongoing	High
C. Provide local maps (print and online) that guide bicyclists to destinations along comfortable routes	1–3 years	High
D. Ensure bicycling is included in planning for autonomous vehicles	ongoing	Low
E. Implement the bicycle count program and publish the data	1–2 years	High
F. Monitor and encourage implementation of the <i>Blueprint</i>	<1 year	High
G. Increase diversity of the Delaware Bicycle Council	<1 year	High
3.3 Increase number and distribution of bicycle organizations and events statewide to encourage bicycling for fun, fitness, and transportation		
A. Expand and increase events that promote bicycling	1–2 years, ongoing	High
B. Offer resources and incentives for bicycle-supportive community organizations, including: hosting networking events and sharing best practices, local grant funding opportunities	1–2 years	High
C. Increase number of mobile bike repair and safety clinics, bike rodeos, Safe Routes to School programs, and other events in communities throughout the state	1–2 years, ongoing	High

3.4 Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DeIDOT and beyond

<p>A. Establish a variety of formal training opportunities for staff, including:</p> <ul style="list-style-type: none"> • training rides that offer professional development credits • technical training on policies, design guidance, etc. • technical training for special/high priority facilities (e.g. protected bike lanes) • field trips 	<p>1–2 years</p>	<p>Moderate</p>
<p>B. Develop partnerships to engage students and the public in implementation of non-motorized count programs and surveying</p>	<p>1–2 years</p>	<p>Moderate</p>
<p>C. Integrate <i>Blueprint for a Bicycle-Friendly Delaware</i> in state and local planning documents and reference in online planning tools and resources</p>	<p><1 year, ongoing</p>	<p>Moderate</p>
<p>D. Fund and promote a Living Laboratory research program to support testing and implementing new treatments, techniques, materials and creative solutions</p>	<p>2–3 years</p>	<p>High</p>

3.5 Establish consistent, uniform, coordinated data gathering and management across agencies that leverages existing data and provides value to all interested stakeholders in their efforts to improve processes, systems, and programs

<p>A. Formalize data coordination efforts across and within agencies, including:</p> <ul style="list-style-type: none"> • Comprehensive listing of data collected (by which entity) • Scheduled updates and regular sharing, if not real-time updates • Performance measures • Crash, GIS, Bike/Ped counts data, etc. 	<p>1–2 years</p>	<p>Moderate</p>
<p>B. Collect bicycles-on-transit data</p>	<p>1–2 years</p>	<p>Moderate</p>
<p>C. Make pedestrian and bicycle data collection part of the project development process, both at project scoping and after construction to assess impacts and benefits.</p>	<p>1–2 years</p>	<p>Low</p>
<p>D. Establish and update bicycle performance metrics and targets over time</p>	<p><1 year</p>	<p>High</p>

3.6 Increase appreciation for and leveraging of bicycling and its broad benefits throughout Delaware

<p>A. Produce a comprehensive Return on Investment Report that quantifies the broad benefits of bicycling to the public, including:</p> <ul style="list-style-type: none"> • economic impact study • health impact study • environmental impact study 	<p>2–3 years</p>	<p>Moderate</p>
<p>B. Incorporate bicycle goals and other elements of this plan into related plans and policies, including Agency/Organizational Work Plans and Strategic Plans</p>	<p>Ongoing</p>	<p>Moderate</p>

IV. Individual Recommendations

The Blueprint for a Bicycle-Friendly Delaware is likely to be implemented over a decade or more. This comprehensive and far-reaching policy plan is intended to establish a shared vision for bicycling among a wide range of stakeholders and then initiate, coordinate, and guide action through its implementation strategies.

Successful implementation of a plan depends greatly on the commitment of stakeholders to work together and follow through. The recommended strategies for implementation, presented in the following pages, include details that are intended to foster coordination and commitment, including identification of stakeholders and roles.

Each recommended strategy includes:

- Further description of the issue being addressed and details that may help with subsequent action, including:
 - » **Timeframe:** an estimate of *how long such an effort might take* once initiated
 - » **Implementation Priority Level:** identification of how immediately the action should be undertaken based on urgency, importance, and potential opportunities
 - » **Additional Resources Needed:** whether additional time and/or monetary resources would be needed to carry out the recommendation
- Identification of primary stakeholders and roles, including:
 - » **Lead:** the organization(s) with the most direct relevance to coordinating and/or implementing the strategy [Note: "Lead" does not imply that the entity is expected to carry out the recommendation without involvement from other organizations. Rather, in most cases, the lead has a natural fit as a coordinator/convener of multiple organizations addressing the strategy together, based on the entity's existing work, mission, and/or relationship with other relevant stakeholders. Being a lead does not imply that the entity is responsible for funding implementation, either. Finding additional funding sources may be an outcome or recommendation of implementing a strategy.]
 - » **Support:** the organization(s) that have a role in supporting the lead in coordination/implementation.
- Additional Information

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 A-1: Complete bicycle level of traffic stress data collection / refinement and integrate into GIS and bicycle travel model.

Description

Extensive work has been completed in the development of the statewide bicycle level of traffic stress (LTS) analysis. An internal working group meets to discuss core strategies and work plan. DelDOT Planning staff have developed preliminary LTS layers in GIS. The next steps are to finalize the data collection, integrate it with the state's centerline database, refine the analysis, and update the dataset. DelDOT Planning should work with the DelDOT Traffic Section to determine how to characterize crossings.

Once complete, the LTS data should be integrated into the state's bicycle travel model, as well as be provided to Metropolitan Planning Organizations (MPOs), county governments, and local municipalities for use in their planning efforts.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DelDOT Planning

Support: Counties, MPOs, municipalities (for application and evaluation)

Additional Information

Complete Communities Low-Stress Bikeability Assessment Tool, University of Delaware, <http://www.completecommunitiesde.org/planning/complete-streets/low-stress-bike/>

Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, MTI Report 11-19, May 2012, <http://transweb.sjsu.edu/PDFs/research/1005-low-stress-bicycling-network-connectivity.pdf>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 A-2: Integrate the low traffic stress approach and data in network and system planning and evaluation.

Description

Bicycle level of traffic stress (LTS) is a key element of future planning for the bicycle network in Delaware. Once the LTS analysis and assimilation of data is complete (see 1.1 A-1), it should be incorporated into local, regional, and statewide planning and processes, including DeIDOT's travel demand model.

DeIDOT will make a refined LTS map available to the public and local governments. LTS is a central consideration in DeIDOT's project prioritization for the State Bicycle and Pedestrian Funding Program – see the full Prioritization Process summary – so it should be well understood by regional and local partners. The State Division of Parks and Recreation may also benefit from integrating the LTS network data into its planning and evaluation processes.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DeIDOT Planning

Support: Counties, MPOs, municipalities (emphasis on application and evaluation), DeIDOT Traffic (regarding intersections and crossings), Delaware State Parks

Additional Information

Planning for Complete Communities in Delaware: The Low-Stress Bikeability Assessment Tool, <http://www.ipa.udel.edu/publications/bikeability-assessment-tool.pdf>

Planning for Complete Communities in Delaware: Research to Develop the Low-Stress Bikeability Assessment Tool, <http://www.ipa.udel.edu/publications/low-Stress-bikeability-2016.pdf>

Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, MTI Report 11-19, May 2012, <http://transweb.sjsu.edu/PDFs/research/1005-low-stress-bicycling-network-connectivity.pdf>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 B: Establish and implement an integrated and targeted land use and transportation development and re-development strategy that improves safety for non-motorized and transit users.

Description

In Delaware, over 90 percent of the transportation system is managed by DeIDOT. Land use is managed by local governments—cities or counties. Decisions and development related to the transportation system have consequences on land use and vice-versa. Across the state's three counties and 57 municipalities, decisions on land use and transportation have achieved various degrees of integration. Deferring to the authority of local government in land use decisions, DeIDOT has historically taken a mitigatory approach to land use decisions, which has meant, in practice, trying to alleviate as much of the financial, safety, and traffic effects of those decisions as possible by trying to maximize developers' contributions for additional road capacity and other modifications that primarily enhance travel for motor vehicles. In contrast, this recommendation envisions a more integrated approach.

This strategy should build on the priority of safety. DeIDOT and land-use-governing entities would provide increased land use and transportation expertise and involvement in project scoping and review. This could include advising on facility design, multi-modal oriented land development, aligning local policy to Complete Streets standards, and strategies to improve safety at high-crash locations. Although metropolitan planning organizations (MPOs) have no legislative authority over land use, they provide planning support to these governmental entities, which can help support a more integrated land use and transportation approach.

This multi-phased strategy, would begin with local communities working with DeIDOT and the local government to identify areas with greater need to address safety and comfort of non-motorized travelers and a desire to become a pedestrian, bicycle, and transit-oriented place. Early actions will focus on corridor safety improvements, such as transit stop placement, signal spacing, and added crossings, particularly in areas identified in safety studies. Intermediate actions will be moderately complex or resource intensive and aim to achieve substantial physical change beyond the public right of way. Later actions – once a critical mass of demand is reached – would include significant public and private sector investment toward bicycle-, pedestrian-, and transit-oriented development, such as major street redesigns and private redevelopment. A specific approach may be the development of Bicycle and Pedestrian Priority Areas (BPPAs) or Complete Community Enterprise Districts (CCEDs) where bicycling is a high priority. These areas should include eligibility for additional resources and could be prioritized for implementation of other Blueprint recommendations, such as enforcement and education.

The CCED has been codified by the Delaware General Assembly as a tool for local communities and DeIDOT to partner to enable bicycle-friendly development. Unlike the BPPA concept, which has no formal policy in place and may be a more flexible mechanism, CCEDs have established requirements.

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 B: Continued

Timeframe: Once initiated, this will take approximately 3–5 years to complete (dependent partly on Comprehensive Plan update timeline)

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: Counties, MPOs, municipalities

Support: DeIDOT Planning and DeIDOT Administration, bicycle advocacy organizations (e.g. Bike Delaware)

Additional Information

See the *Blueprint's* Toolkit resource: "[Integrate Land Use and Transportation](#)"

Example of Bicycle Pedestrian Prioritization Area (BiPPA) in Montgomery County, MD, <https://www.montgomerycountymd.gov/dot-dte/BiPPA/index.html>

Delaware's Complete Communities Enterprise District policy; Delaware's Transportation Improvement District policy, <http://www.completecommunitiesde.org/planning/complete-streets/tid/>



View of Wilmington skyline from Riverfront boardwalk. Source: Derek Sapp, DeIDOT

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 C: Establish policies and processes to ensure transit and bicycle networks complement each other.

Description

The Delaware Transit Corporation, working with DelDOT and local partners, should develop a policy to ensure the integration and planning of transit and bicycle networks. This policy would help operationalize the consideration of bicycle access to transit stations and coordination between bicycling and transit.

Currently, coordination occurs in practice, but there is no official policy or process established that directs when and how coordination occurs. Without a formal policy/process, it is more likely that transit and bicycle systems may be planned and implemented separately and end up working at cross purposes. A simple hypothetical example would be the rerouting of a bus line from one road to another. The road to which the bus line was rerouted was a low-stress bicycle route, where bicyclists now must compete with buses pulling in/out of the right lane and stopping for passengers.

The policy may include the requirement that special considerations be made when transit planning and operational changes occur in Bicycle/Pedestrian Priority Areas or Complete Community Enterprise Districts (see 1.1 B). Additional guidance (such as a project development checklist) could be developed for when operations or route changes are being proposed.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: No

Stakeholders

Lead: DTC in close coordination with entities that plan and develop bicycle facilities

Support: DelDOT Planning, MPOs, counties, municipalities, Bike Delaware

Additional Information

Improving Livability Using Green and Active Modes: A Traffic Stress Level Analysis of Transit, Bicycle, and Pedestrian Access and Mobility, Mineta Institute, May 2017, <http://transweb.sjsu.edu/PDFs/research/1205-improving-livability-using-green-and-active-modes.pdf>

Manual on Pedestrian and Bicycle Connections to Transit, FTA Research, August 2017, <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/64496/ftareportno0111.pdf>

Delaware's Complete Communities Enterprise District policy; Delaware's Transportation Improvement District policy, <http://www.completecommunitiesde.org/planning/complete-streets/tid/>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 D: Establish a statewide bicycle network planning process that encourages local plan development with support and resources from the State and includes development of routes of statewide significance.

★ Core Recommendation

Description

The *Blueprint for a Bicycle-Friendly Delaware* Toolkit's Local Planning Process summary describes the local, regional, and statewide planning process in detail. The process should be clearly communicated to local communities along with other supporting tools in the *Blueprint*. The planning process will result in a statewide map of planned and proposed bicycle facilities. This map should be integrated with FirstMap and ArcOnline/ DelDOT Gateway for ease of use and coordination by stakeholders. The bicycle network planning process and the other recommended *Blueprint* strategies should result in land use and transit planning coordination as part of the local plan development process. Local planning feeds directly into DelDOT's project development process for creating both on-street and off-road bicycle facilities.

As part of DelDOT's low-stress bicycle network process, DelDOT will consider developing Projects of Statewide Significance. These are projects that would be relatively large in scale/scope and likely span multiple jurisdictions. They are typically trail projects, but may include important on-street facilities. Several Projects of Statewide Significance are underway, including the Markell Trail, the Capital City Trail loop and Senator Bikeway in Dover, the Lewes to Georgetown Trail, and the East Coast Greenway route through Delaware.

Future Projects of Statewide Significance will be developed by DelDOT staff in coordination with regional planning efforts (it is anticipated that these projects are likely to also be identified in regional plans).

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: No (however, additional resources will be needed to support local plan development—see 1.1 E)

Stakeholders

Lead: DelDOT Planning, MPOs

Support: Counties, municipalities, OSPC, DBC

Additional Information

See the [Blueprint for a Bicycle-Friendly Delaware's Local Planning Process summary](#)

See [DelDOT's Bicycle Level of Traffic Stress Map](#)

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 E: Provide technical assistance and guidance to local and county-level governments for the development of local project prioritization. Establish a statewide system to solicit local and regional priorities and select projects for state funding. Vet locally and regionally identified projects for implementation feasibility.

★ Core Recommendation

Description

Bicycle project planning in Delaware should be locally driven and supported by DelDOT. The *Blueprint* lays out a detailed explanation of how this process works (see the Local Planning Process Summary in the *Blueprint* Toolkit). Bicycle network planning goes hand in hand with the process of prioritizing components of the network for funding and construction. Prioritization occurs within the local community and is informed by the statewide vision presented in the *Blueprint*. This multi-level approach to prioritization balances serving local community needs and desires, while also contributing to the overall vision for a bicycle-friendly Delaware.

Together the goals of the planning and project prioritization processes and supporting materials are to:

- Develop locally-driven and generated plans and projects, so that once projects get in the queue for funding, local support has been established and projects more easily move forward;
- Establish a full queue of bicycle and trail projects that accomplish state and regional goals and vision;
- Publicize a transparent and easy-to-understand process by which bicycle facility project ideas get considered, funded, and constructed by DelDOT; and
- Make information clear and accessible so stakeholders have the information necessary to be part of implementing the *Blueprint*.

In the short term, DelDOT and local municipalities should implement the planning and prioritization processes on a pilot basis and make revisions and adjustments as necessary.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: To be determined

Stakeholders

Lead: DelDOT Planning

Support: Counties, MPOs, municipalities, U of DE IPA, DBC

Additional Information

See the [Blueprint's Local Planning Process summary](#)

See the [Blueprint's Project Prioritization Process](#) summary for the Bicycle and Pedestrian Funding Program

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 F: Evaluate and identify opportunities to create critical low-stress connections through existing park land.

Description

State, County, and local park land is already in the public domain and could offer great benefit in terms of creating direct connections for transportation-oriented bicycling with relatively little investment. The statewide LTS connectivity analysis, travel demand model, and other planning tools should be used to identify opportunities to increase connectivity through park land while protecting resources and recreational uses.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes, minimal

Stakeholders

Lead: DNREC—Division of Parks and Recreation

Support: DeIDOT Planning, MPOs, Counties, municipalities

Additional Information

Delaware's travel demand model (contact DeIDOT Planning).

See [DeIDOT's Bicycle Level of Traffic Stress Map](#)

Division of Parks and Recreation (DNREC) community accessibility evaluation tool (contact Division of Parks and Recreation).

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 G: Conduct a comprehensive road diet assessment to proactively identify opportunities for bicycle facility expansion and improvement.

Description

Roadways that are wider than needed to accommodate current and anticipated future levels of traffic may be candidates for road diets. Reducing the number of lanes where feasible (most commonly from a four-lane undivided road to two through lanes, a two-way left-turn lane, and bike lanes) not only provides space for bicycling, but tends to improve safety for all road users. DeIDOT should analyze which roads are good candidates for lane conversions, based on their number of lanes, lane widths, and traffic volumes.

This recommendation is intended to be a network level evaluation. Subsequent efforts would include detailed road diet analysis, design, and implementation of improvements.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: Yes, minimal

Stakeholders

Lead: DeIDOT Traffic

Support: DeIDOT Planning, DeIDOT Project Development, counties, MPOs, municipalities (as needed)

Additional Information

Road Diet Informational Guide, Federal Highway Administration, 2014, https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/rdig.pdf

Incorporating On-Road Bicycle Networks into Resurfacing Projects, 2016, https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf

Road Diets: Case Studies, 2017, https://safety.fhwa.dot.gov/road_diets/case_studies/roaddiet_cs.pdf

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 H: Explore strengthening neighborhood connectivity policy, including offering incentives for local street connectivity.

Description

A connected street network – often measured by the number or density of intersections – provides shorter and more direct routes, provides alternate routes along parallel streets, and is easier to navigate than a disconnected network.

In Delaware, there are policies that encourage neighborhood roadway connectivity, but in practice—as evidenced by the abundance of cul-de-sacs and disconnected neighborhoods—connections are not happening.

Agencies should consider requiring connections between neighborhoods (where not currently found in their land use codes) or providing incentives, such as density bonuses or discounts on impact fees, for increased connectivity. If full connectivity of roadways is not possible, connections for bicycles and pedestrians, such as trails and sidewalks may suffice.

Connectivity policy recommendations may include:

- Terminating roads in partially developed neighborhoods with stubs, rather than cul-de-sacs
- Requiring a report in the exceptions process on the damages resulting from not connecting
- Reviewing state and local laws and procedures on connecting local roads and developments to ensure policies and procedures are in place to achieve connectivity and are consistent

Timeframe: Once initiated, this will take approximately 3–5 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes, to be determined

Stakeholders

Lead: DelDOT Development Coordination, land use agencies

Support: MPOs, OSPC, counties, municipalities, legislative bodies

Additional Information

Street Connectivity Guidance Document, Lehigh Valley Planning Commission, <http://www.lvpc.org/pdf/streetConnectivity.pdf>

Street Connectivity, Change Lab Solutions, <http://www.changelabsolutions.org/childhood-obesity/street-connectivity>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.1: Increase the number of homes and destinations connected entirely by the low-stress bicycle network.

1.1 I: Assess DeIDOT rights of way (paper streets) to identify connection opportunities.

Description

DeIDOT (and other government agencies) may hold rights of way that are not being used. These rights of way (ROWs), often called paper streets (a name indicative of the existence of the streets on a paper map, but not in physical existence in the real world) may provide important connections for non-motorized travelers, but have not been prioritized for use for other purposes.

This recommendation would likely involve a multi-step screening to identify the full inventory of available ROWs and subsequent steps to determine the opportunities and priorities for use toward connecting the bicycle network. This inventory will be useful alongside local and regional bicycle network plans to identify opportunities to make connections.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes, to be determined

Stakeholders

Lead: DeIDOT Planning

Support: DeIDOT DOTS

Additional Information

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 A: Establish a streamlined process for simpler projects that have minimal impacts.

Description

Feasibility is an important part of DeIDOT's project assessment. Some projects can be implemented more easily than others. DeIDOT should establish a system for expediting projects that meet specific criteria such as:

- No right-of-way impacts
- No environmental resource impacts
- No utility relocations required
- Public support

The first step is confirming that the criteria listed above are appropriate. Projects that meet those criteria could advance under a formal, abbreviated process with fewer plan submittal stages, facilitating timely project delivery.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes, minimal

Stakeholders

Lead: DeIDOT DOTS

Support: DeIDOT Planning

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 B-1: Create simple and clear guidance for planners and engineers for expanding low-stress networks.

★ Core Recommendation

Description

DelDOT should create simple and clear guidance for people who plan and engineer bicycle facilities. This could take the form of a bicycle facility design guide with details that draws on national best practices and reflect Delaware's unique contexts—rural, suburban, urban—and the preferences of Delawareans.

Guidance developed from this recommended strategy should provide planners and engineers with guidelines for different contexts and types of roadways. It should describe the decision-making process used to determine an appropriate facility if the lowest traffic stress option is not possible due to project constraints. Guidance should address both corridors and intersections, as well as specific conditions that present trade-offs, such as the interaction between bike lanes and right turn lanes.

This guide should address both:

- facility selection; and
- design of facilities.

If a new federal guide (the AASHTO guide) that reflects Delaware's bicycling goals is developed and adopted, then that guide could replace material developed in this recommendation.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: Yes, consultant support

Stakeholders

Lead: DelDOT Planning

Support: DelDOT DOTS, DelDOT Project Development, DelDOT Traffic

Additional Information

Montgomery County, MD, Bicycle Facility Design Toolkit, http://montgomeryplanningboard.org/wp-content/uploads/2017/07/REVISED_Bicycle-Facility-Design-Toolkit-6.30.17-reduced.pdf

Toronto Complete Streets Design Guide, Chapter 5: Street Design for Cycling, <https://www.toronto.ca/wp-content/uploads/2017/11/90c8-Chapter-5.pdf>

Bicycle Facility Design Toolkit—Washington County, Oregon, <https://www.co.washington.or.us/LUT/Divisions/CPM/bike-facility-design-toolkit.cfm>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 B-2: Adopt a Complete Streets implementation strategy that includes full integration of policies into design manuals.

★ Core Recommendation

Description

The purpose of this strategy is to provide further guidance on how the state's Complete Streets Policy is to be applied, and to integrate Complete Streets policies into design manuals and project development processes. This is to be done in coordination with the development of bicycle facility design guidance as part of the DelDOT Road Design Manual update. This would replace the Bicycle Policy on design guidance and facilities development processes and would draw from recent efforts to move from general policy to implementation, such as the Bicycle Friendly Delaware Work Program (June 2014-January 2015) and Draft Complete Streets Policy Implementation Plan (October 2015).

Delaware's Complete Streets Policy identifies the benefits of a multi-modal transportation system. The purpose of the policy is to ensure that modifications to the transportation system are done in a way that enables safe and efficient access for all users. Policy objectives include "defining and implementing changes to the project development process that will value all transportation modes during the project scoping phase and enhance currently used design practices through updates to DelDOT subdivision and design manuals, design memoranda, and policies." Subsequent to the establishment of the policy, anecdotal evidence suggests that Delaware's transportation system has become more accommodating of bicycling. While implementation of the policy has been done in practice, the degree to which bicycling is considered and accommodated varies and it appears accomplishments are often the result of staff initiative rather than formal policy.

The Draft Complete Streets Policy Implementation Plan was prepared to meet the Complete Streets Policy objective to define and develop the processes necessary to achieve the policy goals. The draft plan articulates an implementation framework according to a project's "CS Application Type" based on DelDOT Capital Transportation Plan (CTP) categories. The defined Types are: single

purpose projects; system maintenance projects; safety and traffic management projects; developer projects; and new roads, road expansion and roadway redesign projects. The document also gives design guidance according to different facility types and contexts, such as the types of bicycle facilities that should be applied on a rural collector road in a suburban or rural context.

The draft implementation plan should be reviewed, refined, and expanded on. The design guidance included in the document should be considered for further development and placement in the Road Design Manual rather than within the Complete Streets Policy implementation document.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: Yes, consultant support

Stakeholders

Lead: DelDOT Planning, DelDOT DOTS

Support: Other DelDOT divisions

Additional Information

Bicycle Friendly Delaware Work Program (June 2014-January 2015)

Draft Complete Streets Policy Implementation Plan (October 2015)

Complete Streets in Delaware: A Guide for Local Governments, <http://www.ipa.udel.edu/publications/CompleteStreetsGuide-web.pdf>

Memphis Complete Streets Implementation Manual, <https://bikepedmemphis.wordpress.com/plans-and-publications/complete-streets-project-delivery-manual/>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 B-3: Review and revise, as necessary, design guidance for DeIDOT capital projects to ensure bicycle-friendly design elements, such as street trees and narrower roadway widths, are achievable (especially on priority bicycle routes). This includes, but is not limited to, the Road Design Manual and Project Development Checklist.

Description

Best practices for bicycle facilities and bicycle-compatible roadway designs are always evolving. DeIDOT should update its design guidance and Plan Development Checklist accordingly. Primary efforts will focus on DeIDOT-led projects and early scoping with all agencies and divisions. [Developer projects are addressed in 1.2 B-4.]

The guidance should address elements such as street trees, roadway widths, water, shade, benches, art, lighting, Crime Prevention Through Environmental Design approaches, etc.

Other agencies or organizations may also want to consider adjustments to policies and processes to promote Complete Streets and Trails and Pathways.

In places where bicycle facilities are not included, formal documentation of the rationale should be included, which may be similar to the process used for documenting design exceptions.

Timeframe: Once initiated, this will take approximately 1–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes, consultant support

Stakeholders

Lead: DeIDOT DOTS, DeIDOT Planning (primary efforts focus on DeIDOT and early, collaborative scoping with all agencies and divisions)

Support: DNREC, counties, municipalities (these organizations may need to evaluate their own internal processes/policies, in addition to collaborating with DeIDOT)

Additional Information

Bicycle Friendly Delaware Work Program (June 2014-January 2015) (Contact DeIDOT Planning).

Draft Complete Streets Policy Implementation Plan (October 2015) (Contact DeIDOT Planning).

Complete Streets in Delaware: A Guide for Local Governments, <http://www.ipa.udel.edu/publications/CompleteStreetsGuide-web.pdf>

Memphis Complete Streets Implementation Manual, <https://bikepedmemphis.wordpress.com/plans-and-publications/complete-streets-project-delivery-manual/>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 B-4: Review and revise, as necessary, design guidance for developer projects subject to DeIDOT review to ensure bicycle-friendly design elements, such as street trees and narrower roadway widths, are achievable (especially on priority bicycle routes). This includes, but is not limited to, the Development Coordination Manual.

Description

Design guidance for developers on projects that are subject to DeIDOT review should be reviewed and revised to include current best practices for bicycle facility design and bicycle compatible roadway design. The guidance should address elements such as bicycle parking, trails and shared use paths, sidewalks, street trees, roadway widths, water, shade, benches, art, lighting, Crime Prevention Through Environmental Design approaches, etc.

Timeframe: Once initiated, this will take approximately 1–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes, consultant support

Stakeholders

Lead: DeIDOT Planning
(primary efforts focus on DeIDOT and early, collaborative scoping with all agencies and divisions)

Support: DeIDOT DOTS, DNREC, counties, municipalities (these organizations may need to evaluate their own internal processes/policies, in addition to collaborating with DeIDOT)

Additional Information

DeIDOT Development Coordination, <https://deldot.gov/Business/subdivisions/index.shtml>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 B-5: Aggregating local and regional plans, create a bicycle network master plan. Identify top priority segments in the plan. Report regularly to the Delaware Bicycle Council on significant changes to the plan.

Description

A statewide bicycle network planning process that encourages local plan development is recommended as part of this *Blueprint* (Recommendation 1.1 D). That process is presented in Part 3 of this *Blueprint*, starting on page 94, and includes development and regular updating of a GIS map of planned and developed bicycle network facilities statewide. That planning process acknowledges the importance of close coordination across geographic scales and jurisdictions toward achieving the goal of a “complete, comfortable, connected bicycle network.”

This recommendation further encourages statewide coordination of planning and development of bicycle network facilities through identification of priorities and regular reporting to the Delaware Bicycle Council, which is a multi-sector entity that should have a primary role in coordination and plan implementation. (See recommendation 3.2 F, page 77, regarding the role of the Delaware Bicycle Council in monitoring plan implementation and fostering coordination.)

Timeframe: Once initiated, this will take approximately 1–2 years to complete, with ongoing monitoring

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DeIDOT Planning

Support: DeIDOT DOTS, MPOs, DNREC, counties, municipalities

Additional Information

See the [Blueprint's Local Planning Process summary](#)

See the [Blueprint's Project Prioritization Process](#)

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 B-6: Provide regular updates to the Delaware Bicycle Council on significant bicycle network project development milestones.

Description

DeIDOT and other stakeholders involved in developing and implementing plans for the statewide network of bicycle facilities should provide regular updates to the Delaware Bicycle Council (DBC).

Under this plan, the DBC should be involved in monitoring and encouraging implementation of the *Blueprint for a Bicycle-Friendly Delaware* and fostering coordination (Recommendation 3.2 F, page 77). Regular status updates on bicycle network project development milestones will enable the DBC to successfully follow-through with the monitoring and coordination role.

Timeframe: Once initiated, this will take approximately 1–2 years to complete, with ongoing monitoring

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DeIDOT Planning, DeIDOT DOTS

Support: MPOs, DNREC, counties, municipalities

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 C-1: Establish common bicycle route signage.

Description

Bicycle route signage and pavement markings are important for helping people on bikes navigate to destinations and know they are on the right route. Signage and markings can also contribute to establishing a brand or community identity. When signage/markings are within the public right of way (including public shared-use, off-roadway trails) they must conform to standards such as the Delaware MUTCD.

DeIDOT has been working to develop low-stress bike route signage that meets requirements. Formal adoption of the sign will be complete in 2018, with implementation to occur over time. This short-term priority should be complemented by additional standards over time.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DeIDOT Traffic, DeIDOT Planning

Support: Delaware Office of Tourism, Delaware State Parks, counties, municipalities, community bicycle organizations (e.g. Bike Delaware)

Additional Information

Delaware MUTCD, updated Nov. 2017, https://deldot.gov/Publications/manuals/de_mutcd/index.shtml

NACTO Bike Route Wayfinding Signage and Markings System, <https://nacto.org/publication/urban-bikeway-design-guide/bikeway-signing-marking/bike-route-wayfinding-signage-and-markings-system/>

US Bike Route Signs, <https://www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/implement-a-us-bicycle-route/sign-a-us-bike-route/>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 C-2: Establish a guide for local entities to facilitate safe, easy navigation.

Description

Bicycle route signage and pavement markings are important for helping people on bikes navigate to destinations and know they are on the right route. Signage and markings can also contribute to establishing a brand or community identity. When signage/markings are within the public right of way (including public shared-use, off-roadway trails) they must conform to standards, such as the Delaware MUTCD.

Accomplishing community branding, effective wayfinding for the local and wider bicycle network, and compliance with the Delaware standards is not easy. There are challenges of coordinating among many stakeholders and integrating signage/markings across jurisdictional boundaries. Further, aside from the standards documents, which are highly technical, the full range of interested parties have little guidance material.

The Delaware Office of Tourism, DeIDOT, and partners have already initiated efforts to address signage and wayfinding throughout the state in recent years. This group should share what it has learned and translate it to an easy-to-use guide for bicycle route signage/markings and wayfinding issues. The guide should be oriented toward local communities and explain how they can conform to standards while also accomplishing wayfinding and branding goals. Topics to address could include:

- Signage outside of the roadway (e.g. at trail/pathway intersections)
- Transitions across jurisdictions and facility types
- Integration or local community identity and branding with a wider bicycle network.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Low

Additional Resources Needed: No

Stakeholders

Lead: DeIDOT Planning

Support: Delaware State Parks, counties, municipalities, community bicycle organizations (e.g. Bike Delaware), chambers of commerce, tourism organizations, bicycle clubs

Additional Information

Delaware MUTCD, updated Nov. 2017, https://deldot.gov/Publications/manuals/de_mutcd/index.shtml

NACTO Bike Route Wayfinding Signage and Markings System, <https://nacto.org/publication/urban-bikeway-design-guide/bikeway-signing-marking/bike-route-wayfinding-signage-and-markings-system/>

US Bike Route Signs, <https://www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/implement-a-us-bicycle-route/sign-a-us-bike-route/>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 D: Add bicycling considerations to roadway lighting guidelines.

Description

Lighting improves visibility and safety at trailheads, access points, and intersections for night use, and is critical for safety and security in tunnels and underpasses. In particular, lighting for bicyclists should be provided on high-priority routes and at crossing locations.

Consider coordinating lighting prioritization with implementation of Bicycle and Pedestrian Priority Areas (BPPAs) concept (see 1.1 B).

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DeIDOT DOTS

Support: Counties, municipalities, DeIDOT Planning

Additional Information

DeIDOT Lighting Design Guidelines, 2009, revised 2012, https://deldot.gov/Publications/manuals/lighting/pdfs/lighting_guidelines_2012-10-01.pdf

(Note: DeIDOT is undergoing updates to lighting design guidelines in 2018 and additional guidance since 2012 are available through the Department)

Delaware Transportation Lighting Inventory & Assessment, IPA, February 2016, <http://www.ipa.udel.edu/publications/transportation-lighting-2016.pdf>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.2: Increase bicycling comfort: Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.

1.2 E: Establish and apply access management policies and design guidance for dealing with sidepath and motor vehicle interactions.

Description

Access management, the coordination between roadway design and land use planning to improve transportation, includes the consideration of the placement and design of driveways, side streets, and development to minimize conflicts and improve access to destinations by different modes. Reducing the number and frequency of driveways and side streets across paths and trails helps reduce the number of conflicts for bicyclists using sidepaths. Access management can also have driver safety benefits.

Recent sidepath research conducted by the Michigan DOT shows that the most common sidepath/vehicle crash trends are:

- Bicyclists riding through signalized intersections have a higher risk than at intersections with other types of traffic control
- At intersections, sidepath crashes tend to occur with left- or right-turning vehicles
- Bicyclists riding against traffic have a higher risk of crash with right-turning vehicles
- Bicyclists riding against traffic have a higher crash risk at commercial driveways and signalized intersections

Design treatments at crossings and intersections that may reduce the frequency and severity of crashes include:

- Raised crossings
- Truck aprons
- Warning signs and pavement markings

Timeframe: Once initiated, this will take approximately 3–5 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DelDOT DOTs, DelDOT Planning

Support: Counties, municipalities

Additional Information

Virginia DOT's Access Management Best Practices Manual, http://www.virginiadot.org/programs/resources/Asset_Mgmt_Best_Practices_Manual_BP_12.9.pdf

Chapter 6 of NCDOT's Design Toolbox, <https://www.ncdot.gov/bikeped/walkbikenc/pictures/designtoolbox.pdf>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.3: Improve maintenance of shoulders, trails, and on-street bicycle facilities.

1.3 A: Develop a statewide strategic maintenance plan and policies specific to bicycling.

Description

DelDOT should establish a statewide strategic maintenance plan and policies specific to bicycling. The plan and policies should include:

- Priority bicycle corridors, which would be prioritized for routine maintenance like plowing, sweeping, clearing of vegetation, etc.
- Defined maintenance responsibilities before projects are built (funding, responsible parties, etc.)
- Increased funding for routine maintenance
- Options for collaborative maintenance and contracting out maintenance to third parties

Timeframe: Once initiated, this will take approximately 2–3 years to complete

Implementation Priority Level: Low

Additional Resources Needed: Yes, additional staff support

Stakeholders

Lead: DelDOT Maintenance and Operations, DelDOT DOTS

Support: DelDOT Planning, DNREC, counties, municipalities, community volunteer organizations, community bicycle organizations/clubs (e.g. Bike Delaware, White Clay Bicycle Club, Sussex Cyclists, etc.)

Additional Information

Winter Maintenance of Pedestrian Facilities in Delaware: A Guide for Local Governments, IPA, 2012, <http://www.ipa.udel.edu/publications/SnowRemoval.pdf>

ADA Facility Maintenance Requirements, Complete Community Toolbox, <http://www.completecommunitiesde.org/planning/complete-streets/maintenance/>

Bicycle Facility Maintenance, FHWA, https://safety.fhwa.dot.gov/PED_BIKE/univcourse/pdf/swless21.pdf

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.3: Improve maintenance of shoulders, trails, and on-street bicycle facilities.

1.3 B: Establish an online map-based maintenance request process .

Description

Routine and emergency maintenance of bicycle facilities requires coordination among multiple entities. DelDOT is primarily responsible for on-road facilities and also supports maintenance of some off-road facilities. Other entities that maintain bicycle facilities include state and local departments of parks and recreation, and public works departments. Community and volunteer organizations also play a role, both in reporting maintenance needs as well as hands-on work.

Currently, although maintenance of bicycle facilities across the state is generally considered effective, there may be ways to improve coordination, especially as the network grows.

In coordination with construction of additional bicycle facilities and implementation of a strategic maintenance plan specific to bicycles (Recommendation 1.3 A), DelDOT and partners should establish a streamlined, online map-based maintenance request process. This could be linked with the on-going Delaware WikiMap. Based on the location and other information provided, the system could generate an automated email to all appropriate organizational contacts (e.g. DelDOT, Delaware State Parks, county, municipality, Trail Spinners, etc.) when any “maintenance” element is submitted online or by phone.

Timeframe: Once initiated, this will take approximately 3–5 years to complete

Implementation Priority Level: Low

Additional Resources Needed: To be determined

Stakeholders

Lead: DelDOT Maintenance and Operations, DelDOT DOTS

Support: DelDOT Planning, DNREC, counties, municipalities, community volunteer organizations, community bicycle organizations/clubs (e.g. Bike Delaware, White Clay Bicycle Club, Sussex Cyclists, etc.)

Additional Information

Delaware WikiMap, <http://wikimapping.net/wikimap/Delaware-Bike-Plan.html#.WNlVnm8rLRY>

DelDOT Report a Road Condition, https://delDOT.gov/About/contact_info/index.shtml

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.3: Improve maintenance of shoulders, trails, and on-street bicycle facilities.

1.3 C: Ensure work zone accommodations continue to be sufficient for bicyclists.

Description

Ensuring that sufficient work zone accommodations are made for bicyclists is part of the project development checklist and should be part of the ongoing performance evaluation.

When a permitted construction project blocks a sidewalk, bicycle lane, or other bicycle facility, the entity receiving the permit should be required to provide a safe accommodation for bicyclists. Existing policy, as spelled out in the Delaware MUTCD, addresses work zone concerns, but consistent implementation may be a concern, particularly with regard to sufficient accommodations on roads adjacent and leading to the work zone.

Conduct analysis or spot-check to determine how well the policy is put into practice. Consider additional training in coordination with recommendations under Objective 3.4 to support full and sufficient implementation of the policy.

Timeframe: Once initiated, this will take less than a year to complete, with ongoing monitoring

Implementation Priority Level: High

Additional Resources Needed: Yes, consultant support

Stakeholders

Lead: DeIDOT Safety / Traffic

Support: DeIDOT DOTs, local public works departments, DeIDOT Planning, DeIDOT Public Works

Additional Information

Virginia Department of Transportation on Work Zone Pedestrian and Bicycle Guidance, May 1, 2016, http://www.virginiadot.org/business/resources/wztc/2016_WZ_Ped_BikeGuide.pdf

Washington, D.C., <https://dcregs.dc.gov/Common/NoticeDetail.aspx?NoticelId=49974>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.4: Increase regional and long-distance travel possibilities for bicyclists.

1.4 A: Improve bicycle trip-planning app that emphasizes longer distances and regional travel opportunities.

Description

Create or improve an existing bicycle trip-planning application to include a recreation- and tourism-oriented component. Consider coordination led by a statewide bicycle advocacy, nature-oriented, or tourism-oriented entity with support from other interested agencies.

A good model is GoPhillyGo.com. The Clean Air Council, Philadelphia's oldest environmental non-profit, is responsible for the GoPhillyGo app. While the GoPhillyGo app does include Delaware destinations and can provide trip planning within origins, stops, and/or destinations in Delaware, it is not integrated with Delaware websites, nor is it oriented toward Delaware tourism or travel. Initial research and planning should include outreach to the Clean Air Council to better understand the opportunities to build on their existing app or use the same technology.

DTC currently has a multi-modal transportation-based trip planning app through Google, which should also be considered for integration.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: To be determined

Stakeholders

Lead: DeIDOT Planning

Support: WILMAPCO and Dover-Kent County MPO (for data coordination), DTC, DeIDOT Department of Technology and Innovation, community organizations, DBC, DNREC, Clean Air Council (Philadelphia), Delaware Office of Tourism, local tourism organizations

Additional Information

Philadelphia, <https://gophillygo.org/>

Minnesota, <http://www.exploreminnesota.com/pedal-mn>

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.4: Increase regional and long-distance travel possibilities for bicyclists.

1.4 B: Coordinate bicycle network development with transit planning for regional and long-distance travel.

Description

Combining transit trips with bicycling can provide an effective means to expand the reach of the transit system. If the route is safe, comfortable, and convenient, a traveler may bike one to three miles at either end of a transit trip. First and last mile is the experience that links people to and from transit and connects their origins and destinations. Poor first- and last-mile connectivity to transit can be a barrier to accessing transit and may result in modal conflicts at transit stations.

DeIDOT Planning and DTC should coordinate bicycle network development with transit planning, including establishing regional transit/bicycle routes where transit service caters to bicycles on board, to improve regional and long-distance travel possibilities. DeIDOT and DTC should also work together to identify infrastructure barriers to biking and walking to transit and develop strategies to improve first- and last-mile access to transit (e.g., multi-modal design solutions, wayfinding, road diets, traffic calming measures).

Also see Objective 1.1 and coordinate with land use/ transportation integration strategies. This effort should align with Complete Community Enterprise Districts and demand analysis work.

Timeframe: Once initiated, this will take approximately 3–5 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: To be determined

Stakeholders

Lead: DeIDOT Planning, DTC

Additional Information

Biking and Riding DART, <https://dartfirststate.com/information/programs/bike/index.shtml>

Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts, <https://goo.gl/n5hguk>



Floating Bus Stop in Seattle. Source: NACTO Urban Street Design Guide

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.5: Increase funding options and strategic partnerships for network investment.

1.5 A: Direct resources and assistance to local and county governments to support local network planning.

Description

As described in the *Blueprint*, local bicycle network planning is an important foundation on which to build and achieve a more bicycle-friendly state. Having local, community driven plans in place is the starting point for many other recommended actions in this plan and especially important for guiding limited resources to constructing facilities that lead to a complete, comfortable, connected bicycle network.

DelDOT should support local governments with funding and planning assistance as resources allow. This may include support through DelDOT Planning, State Planning & Research (SPR) funds, hiring consultants, or providing planning services through the University of Delaware Institute for Public Administration. This could address concerns from local communities about having sufficient resources to prepare a bicycle plan.

An initial step is to evaluate possible sources of support and funding.

Timeframe: Once initiated, this will take approximately

1–2 years to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DelDOT Planning, MPOs

Support: Counties, municipalities, OSPC, U of DE IPA

Additional Information

Delaware DOT Research, https://research.transportation.org/wp-content/uploads/sites/31/2017/07/DE_Fact_Sheet_Feb2013.pdf

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.5: Increase funding options and strategic partnerships for network investment.

1.5 B: Define processes for leveraging and applying private funds for bicycle infrastructure.

Description

There is significant interest in Delaware to support trail projects and other bicycle infrastructure with private funds. DeIDOT should define processes for leveraging and applying private funds for various components of infrastructure. This could include trail or bike lane projects being funded all or in part by private funds, as well as broader streetscape enhancement projects. The processes should include proactive steps to ensure equity, so that funds and projects do not concentrate in high-income areas.

Timeframe: Once initiated, this will take approximately 2–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: To be determined

Stakeholders

Lead: DeIDOT Finance, DeIDOT Planning

Support: DBC, charitable organizations, community bicycle organizations (e.g. Delaware Greenways)

Additional Information

Boulder, Portland, and Washington state offer good funding examples

Goal 1. Develop a Complete, Comfortable, Connected Bicycle Network

Objective 1.5: Increase funding options and strategic partnerships for network investment.

1.5 C: Develop strategic partnerships for using easements.

Description

Trails are generally built within linear corridors. Utility and power companies generally also rely on linear corridors. With the right agreements in place, trail developers and utility companies can make natural partners. Utility companies, railroad entities, and parks and recreation departments are all potential partners for trail development.

The key to building a trail on a utility corridor is a legal agreement that protects the interests of both the company and the public agency or organization. This will usually take the form of a corporate agreement or a Memorandum of Understanding (MOU). The agreement will typically address easements, duration of agreement, liability, responsibility for property damage or illicit activity, fees or construction subsidy, and an annual operations plan.

The attitude of Delmarva Power to trails within the company's power line rights of way and easements has shifted as the company's ownership has changed over the years. As of 2018, Delmarva's ownership support trails, which may provide a window of opportunity to execute an MOU that benefits trail construction.

The Delaware Bicycle Council (DBC) is composed of a wide range of individuals representing different geographic areas of the state and with diverse professional/organizational affiliations. The DBC should be a forum for initial discussion toward developing strategic partnerships, and provide expertise, guidance, and coordination support to state and local leaders who drive these actions.

Timeframe: Once initiated, this will take approximately 1–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes

Stakeholders

Lead: DBC

Support: DeIDOT Planning, Delaware State Parks

Additional Information

Rails with Trails, Rails to Trails Conservancy, http://www.railstotrails.org/resources/documents/resource_docs/Rails-with-Trails%20Report%20reprint_1-06_lr.pdf

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.1: Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails.

2.1 A: Develop and implement a phased public education and training strategy.

Description

A broad group of partners, including the Office of Highway Safety, Department of Motor Vehicles, Department of Education, and DeIDOT, should develop and implement a phased public education and training strategy that includes a comprehensive educational program to address travel and safety through all life phases and needs. This would address people of all ages, traveling by all modes, as done in places such as Denmark.

Delaware's Bringing Education and Safety Together (B.E.S.T.) program, led by Ceci and John McCormick, offers a comprehensive model and foundation on which to build. Efforts should be done in coordination with Safe Routes to School activities.

Developing a truly comprehensive program is no easy undertaking. Doing so will require a strategy that overcomes the challenge of coordination across many stakeholders, and implementation across a decentralized education system.

Timeframe: Once initiated, this will take approximately 1–10 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: OHS, DMV, DeIDOT Planning, Department of Education

Support: DBC, DPH, MPOs, municipalities

Additional Information

Delaware's B.E.S.T. Program, <http://www.wilmapco.org/heelsandwheels/BEST.pdf>

Wisconsin's programs, <http://wisconsindot.gov/Pages/safety/education/bike/education.aspx>

Washington, DC, Public Schools Rolls Into Year Two of Biking Program, <http://www.waba.org/blog/2016/08/dc-public-schools-rolling-into-year-two-of-biking-program/>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.1: Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails.

2.1 B: Expand the targeted education and enforcement strategy currently used in some Delaware communities.

Description

Currently, a number of Delaware communities use a targeted approach to address bicyclist safety that combines education and enforcement. For example, in the resort communities of Sussex County, where bicycling, fun, and congestion come together every summer, a multi-faceted education and enforcement strategy addresses the unique situation of needing to ensure safety while also maintaining an enjoyable experience for visitors. The multi-faceted strategy includes: a program that focuses on providing equipment and educating J-1 visa students that come to work in Delaware from overseas; safety checkpoints throughout the summer season to build awareness of local laws, educate riders on safe practices, and distribute proper equipment; and enforcement of laws in ways that promote safety but are not heavy handed. A similar approach exists in Newark, where emphasis is placed on achieving safety in the unique context of a college town.

These approaches help ensure riders are aware of laws, are using proper equipment and practice safe riding habits, and prevent heavy-handed enforcement that may actually discourage people from riding.

These programs should be expanded to other parts of the state. Expansion could include integrated safety/enforcement in other priority areas, such as near schools in coordination with Safe Routes to School programs, or around other important community destinations.

This recommendation is a step that would likely be a prelude to more comprehensive education and enforcement efforts (see Recommendation 2.1 A and 2.1 F).

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DeIDOT Planning

Support: DBC, community organizations, bicycle clubs, state and local law enforcement

Additional Information

Refer to Delaware's existing model (Contact DeIDOT Planning)

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.1: Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails.

2.1 C: Include bicycle safety in driver's education and testing and use incentives for bicycle-focused safety in safe driver training.

Description

The Department of Motor Vehicles/Department of Education should include – preferably require – bicycle safety components in driver's education and testing. Special consideration should be given to including new bicycle laws, such as Delaware's change-lanes-to-pass-bicycles rule (unique in the United States), in driver's education. Consider ways to ensure these less common laws are also understood by out-of-state drivers who apply for a Delaware license,

Currently, the standard class D driver's license is issued as follows: If you are under the age of 18 years old in Delaware you come through the Department of Education to get your license. If you are older than age 18 you go through DMV. Exceptions include: if you are a special education student over the age of 18, you would go through the Department of Education; and if you are a student issued a Blue Driving Certificate from your high school and let six months pass before going to the DMV, you would have to take both the written and driving tests through the DMV.

State agencies should also work with insurance companies to incorporate non-motorized road-user safety in defensive driver trainings. Education should start with the assumption of an increase in non-motorized travel and higher population of older travelers of all modes.

Timeframe: Once initiated, this will take approximately 1–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: To be determined

Stakeholders

Lead: DMV, Department of Education

Support: DBC, OHS, bicycle advocacy organizations (e.g. Bike Delaware)

Additional Information

Idaho Adds Bicycle Questions to Driving Tests, <https://www.bicycling.com/news/advocacy/idaho-adds-bicycle-questions-to-driving-tests>

Bikes on Driver Test, Bike Texas, <http://www.biketexas.org/es/advocacy/bikes-on-driver-test-bill>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.1: Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails.

2.1 D: Improve education and training of professional drivers regarding bicycle interactions.

Description

This strategy recommends improvement in the education and training of professional drivers, including bus drivers, truck drivers, emergency responders, and law enforcement officials, on how to safely interact with bicyclists. Training topics should include how to safely make turns, loading and unloading, bicycle rights, and rules of the road.

In Delaware, training of professional drivers is administered by multiple agencies for their own staff of drivers, including DeIDOT, the Department of Education, the Delaware Transit Corporation, and the Delaware State Fire School (for Police, EMS, and Fire). The Division of Motor Vehicles administers commercial driver licenses.

Timeframe: Once initiated, this will take approximately 3–5 years to complete

Implementation Priority Level: Low

Additional Resources Needed: To be determined

Stakeholders

Lead: OHS, DMV, DeIDOT, Department of Education, DTC

Support: DBC

Additional Information

San Francisco Bicycle Coalition Professional Driver Education, <http://www.sfbike.org/our-work/safety-education/driver-education/>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.1: Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails.

2.1 E: Implement evidence-based public safety campaigns toward safety for bicyclists.

Description

State agencies should implement targeted, evidence-based and best-practice public safety campaigns, including communicating laws and expectations through various media. Efforts may include yard signs, public service announcements, variable message boards, and social media.

The campaigns should be based on proven road safety campaign successes, including behavior change and social persuasion theories. Potential approaches include awareness raising, directing behavior change, education on laws, skill development and tips, humor, and humanization. Fear-mongering and victim-blaming should be avoided.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: OHS, DPH, DeIDOT Planning

Support: DeIDOT Traffic, bicycle advocacy organizations (Bike Delaware), community bicycle organizations/clubs, DBC, municipalities, counties

Additional Information

"Watch for Me NC," <http://www.watchformenc.org/>

Bike with Care, Pittsburgh, <http://www.bikepgh.org/care/>

It Stops Here, San Francisco, SFMTA, <https://www.sfmta.com/about-sfmta/blog/safe-streets-sf-0>

Road Safety Not Rocket Science, Philadelphia, <https://phillymotu.wordpress.com/roadsafetynotrocketscience/>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.1: Improve skill and care of drivers, bicyclists, and other users of streets, sidewalks, and trails.

2.1 F: Review and update police training and enforcement statewide and across jurisdictions to result in safer bicycling and driving, but not reduced bicycling.

Description

This strategy recommends that safety, transportation, and enforcement agencies coordinate safety campaigns with heightened enforcement. Different types of concerns in different community contexts should be considered. For example, suburban and rural areas may have more concerns relating to speeding and distracted driving; urban areas may have more concerns with sidewalk bicycling and aggressive driving.

Enforcing laws is an important part of protecting bicyclists and all users of the transportation system as well as promoting a bicycling-supportive culture. To ensure enforcement results in bicyclists of all types feeling safer and balances comfort and safety for all road users, education and enforcement should be done with emphasis of vulnerable users and consideration of equity. For example, an officer could give a warning to a bicyclist breaking the law by riding on a sidewalk rather than issuing a ticket and fine, acknowledging that the bicyclist may have no other (safer) transportation options and was traveling on the sidewalk to avoid the dangers of riding on the street. Such an approach to enforcement requires considerable judgment exercised by the enforcement officer, which could be supported by good training. Coupled a targeted education strategy, this approach is may result in modified behavior of bicyclists without more negative consequences, such as accumulated fines and/or abandoning bicycling.

This strategy may consider emphasis on Bicycle and Pedestrian Priority Areas (see 1.1B) and along priority bicycle corridors.

Agencies should also consider how bicycling will be impacted by new transportation technology, such as autonomous vehicles.

Timeframe: Once initiated, this will take approximately 3–5 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes, to be determined

Stakeholders

Lead: DSP, DBC

Support: DeIDOT Planning, local policy/enforcement entities, OHS

Additional Information

Pedestrian and Bicycle Information Center, Working with Law Enforcement Officers, http://www.pedbikeinfo.org/programs/enforcement_worklawenforce.cfm

Wisconsin DOT Bicycle Safety Education page, see “Law Enforcement”, <http://wisconsindot.gov/Pages/safety/education/bike/education.aspx>

Governors Highway Safety Association, <https://www.ghsa.org/state-laws/issues/Distracted-Driving>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.2: Improve non-motorized crash and injury data collection, analysis, and report dissemination to guide system and program improvements.

2.2 A: Annually analyze all police reports for serious and fatal bicycle crashes and integrate with past annual crash reports. Highlight patterns and make recommendations regarding countermeasures.

Description

Data on serious and fatal bicycle crashes are regularly collected through the DelJIS system and compiled/ reported in the annual Delaware State Police crash report. The report presents high level analyses about geographic distribution and other characteristics, but does not extract full value from the data that could help inform important data-driven actions and safety interventions.

A first step for this recommendation would be to establish a working group to develop appropriate processes to review and derive meaningful information while also ensuring necessary protocols are followed for potentially sensitive data.

Timeframe: Once initiated, this will take approximately 1–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes

Stakeholders

Lead: DSP, DeIDOT Traffic, OHS, DeIDOT Planning

Support: DeIDOT Planning

Additional Information

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.2: Improve non-motorized crash and injury data collection, analysis, and report dissemination to guide system and program improvements.

2.2 B: Identify errors that might be introduced into non-motorized crash data and analysis, and establish and implement best practices for data accuracy and application.

Description

Data collection for crashes is dictated primarily by state law and other requirements from various entities involved, such as the State Police, as well as federal guidelines such as the Model Minimum Uniform Crash Criteria. Data on serious and fatal bicycle crashes are regularly collected through the DelJIS system. These data are entered into the system by trained police following a crash and include many details, such as time of day, weather conditions, other contributing factors, and there is a multi-step review process to ensure data accuracy. Crash data in this system, however, typically only include crashes that involve motor vehicles and standard evaluation practices are heavily oriented toward understanding crashes and safety in terms of motor vehicles and related interventions. Other sources such as Trauma Registry and hospital discharge data exist, which may also be useful to understanding and addressing bicycle safety concerns.

This recommendation should involve creating a process to compile the largest possible data set of bicycle crashes and incidents, including incidents not currently tracked (e.g. beyond ROW, minor incidents with no police report, not involving vehicles, self-reported near misses) and create a robust process for sharing this data online to interested agencies and the public. The level of detail of crash data necessary for purposes of implementing strategies in this *Blueprint* and achieving its goals may benefit from establishing a database or tracking method separate from the DelDOT CARS / DelJIS database.

This strategy recommends evaluating the comprehensive non-motorized data collection, evaluation, and application processes to:

- ensure bicycle crash data is comprehensive and takes advantage of the full range of information already collected
- data is accurate through all steps of processing and evaluation (identifying sources of error or confusion that might be introduced after data enters the DelJIS system)
- information collected answers the questions that matter to improving safety and conditions for cyclists and others users of facilities
- insights gleaned and subsequent mitigatory actions taken are fully informed by the full range of valuable information that is available

An initial step in implementing this recommendation should be to convene a working group of the full range of stakeholders involved in one or more steps of the data collection, management, analysis, and reporting process to define needs, opportunities, desired uses and goals for bicycle crash data. This early step will help broadly define why and how stakeholders would like to use the data and can focus subsequent steps. In general, valuable data would explain what circumstances contribute to bicycle crashes and be used to inform and improve various aspects of the bicycle program.

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.2: Improve non-motorized crash and injury data collection, analysis, and report dissemination to guide system and program improvements.

2.2 B Continued

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DBC, DeIDOT Planning

Support: DeIJIS (maintain all crash records), DeIDOT Traffic

Additional Information

FHWA Crash-Type Manual for Bicyclists, <https://www.fhwa.dot.gov/publications/research/safety/pedbike/96104/>

Connecticut Crash Data Repository (CTCDR), <https://www.ctcrash.uconn.edu/>

Example of Self Reporting Site, <https://nearlykilled.me/>

Washington Area Bicyclists Association (WABA), https://org.salsalabs.com/o/451/p/salsa/web/questionnaire/public/?questionnaire_KEY=1200

Model Minimum Uniform Crash Criteria (federal guidelines), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811631>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.3: Reduce risk and perceived risk associated with bicycling, creating a reputation that Delaware is serious about protecting non-motorized/vulnerable users.

2.3 A: Consider updating the Strategic Highway Safety Plan to more fully incorporate a proactive safety approach for bicycling.

Description

Delaware's Strategic Highway Safety Plan (SHSP) is a policy document that direct priorities and actions within DelDOT and related State agencies. A current version addresses bicycling in limited ways. Updating this plan to more fully incorporate a proactive safety approach for bicycling would speak to the importance of bicyclists as users of the transportation system.

The 2015 SHSP, Delaware's current plan, covers the period from 2016 through 2020 and focuses on seven data-driven emphasis areas (EAs). The decision to include an EA in the SHSP is based both on an analysis of several years of statewide crash data and collaboration with representatives from a multi-disciplinary group of stakeholders. Bicycle-related fatalities and serious injuries were considered as a potential EA; however, a bicycle EA was not selected for inclusion in the 2015 SHSP due to limited crash history when compared to EAs included in the plan.

As active transportation modes, people walking and bicycling are the most vulnerable users of the transportation system. They share many of the same safety concerns and can benefit from similar safety countermeasures and strategies. Therefore, one opportunity to implement this recommendation may be to expand the Pedestrian EA in future SHSPs to more generally include all active transportation modes.

This recommendation could also support the ongoing efforts of the Pedestrian/Bicycle Working Group to perform pedestrian/bicycle road safety audits along corridors demonstrating higher than average pedestrian and bicycle crash histories. Bicycle/Pedestrian Priority Areas and Complete Community Enterprise Districts (see 1.1B and 2.3 B) may be effective implementation tools; in these areas the SHSP may be applied with a focus on non-motorized travelers.

Timeframe: Once initiated, this will take approximately 2–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DelDOT Traffic

Support: DSP, OHS, other DelDOT divisions

Additional Information

City of Seattle Bicycle and Pedestrian Safety Analysis, https://www.seattle.gov/Documents/Departments/SeattleBicycleAdvisoryBoard/presentations/BPSA_Draft_Public_093016.pdf

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.3: Reduce risk and perceived risk associated with bicycling, creating a reputation that Delaware is serious about protecting non-motorized/vulnerable users.

2.3 B: Establish a process whereby priority bicycle (and pedestrian) areas are identified and used to inform development and application of policy and processes that can best enhance bicycle (and pedestrian) safety and comfort.

Description

The recommendations included in this *Blueprint* include engineering, education, enforcement, and other categories of intervention. In some cases interventions have a need or opportunity to be implemented uniformly throughout the state, while other interventions may best be implemented through approaches that are specifically targeted for geographic areas prioritized for bicycling (and walking).

Evaluate and identify target corridors for bicycling and walking, in coordination with recommendation 1.1 B and 2.3 A, as an implementation tool where the Strategic Highway Safety Plan can be applied with a particular focus on non-motorized travelers. This strategy may include the use of Bicycle/Pedestrian Priority Areas or Complete Community Enterprise Districts.

Begin with target areas and adjust level of service, performance measures, and other policy toward bicycle and pedestrian safety.

Timeframe: Once initiated, this will take approximately 2–3 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DeIDOT DOTS, DeIDOT Planning

Support: OHS, counties, municipalities, MPOs, bicycle advocacy organizations (e.g. Bike Delaware)

Additional Information

Vision Zero Network, <https://visionzeronetwork.org/>

Philadelphia Vision Zero Action Plan, <http://www.visionzerophl.com/>

Toward Zero Deaths, the National Strategy on Highway Safety, <http://www.towardzerodeaths.org/>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.3: Reduce risk and perceived risk associated with bicycling, creating a reputation that Delaware is serious about protecting non-motorized/vulnerable users.

2.3 C: Regularly publish statistics on bicyclist safety.

Description

Create and update a simple dashboard on DeIDOT's bicycle landing page to show safety trends over time, drawing from annual crash reports. Over time, coordinate implementation with any needed crash data collection, management, and analysis improvement.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: Moderate

Additional Resources Needed: No

Stakeholders

Lead: OHS, DSP, DeIDOT Planning, DeIDOT Traffic

Support: DBC

Additional Information

Cambridge, MA, Bicycle Crash Summary Report, <http://www.cambridgema.gov/CDD/Transportation/bikesincambridge/bicyclecrashinformation>

Bicycling & Walking in the U.S. Benchmarking Project, <http://bikingandwalkingbenchmarks.org/>

Delaware's Annual Traffic Statistical Report, <https://dsp.delaware.gov/pdfs/2015%20Traffic%20Annual.pdf>

Goal 2. Improve Bicyclist Safety and Confidence

Objective 2.3: Reduce risk and perceived risk associated with bicycling, creating a reputation that Delaware is serious about protecting non-motorized/vulnerable users.

2.3 D: Annually review and update laws and enforcement practices to protect vulnerable users.

Description

Delaware recently passed a provisional “yield for stop” law. Additional updates may be warranted. Possible examples include:

- Putting the onus on the driver to prove innocence in the event of a crash
- Ensuring consistency and predictability across jurisdictional boundaries in laws and enforcement of laws
- Clarifying that bicyclists have right of way where sidepaths cross driveways
- Training law enforcement officials to deal with issues of equity (e.g. when to ticket sidewalk riding)
- Ensuring laws and law enforcement support and encourage safe practices (e.g. when is sidewalk riding safe and legal)

Timeframe: Once initiated, this will take approximately 3–5 years to complete

Implementation Priority Level: Low

Additional Resources Needed: No

Stakeholders

Lead: DBC, bicycle advocacy organizations (e.g. Bike Delaware)

Support: legislative bodies

Additional Information

Maryland Safety Task Force Recommendations, P. 21, http://www.mdot.maryland.gov/newMDOT/Planning/Bike_Walk/Documents/Update_2018/MD_Bicycle_Safety_Task_Force_Final_Report.pdf

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.1: Increase bicycle use through encouragement of bicycling as safe, convenient, affordable, and fun.

3.1 A: Increase the number of bicycle-friendly communities and businesses.

Description

Increase Travel Demand Management programs that encourage bicycling, including employer incentive programs. Proactively evaluate and plan a timed implementation strategy, such as when the Markell Trail is complete.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DeIDOT Planning, municipalities

Support: DBC, counties, MPOs, bicycle advocacy organizations, community organizations

Additional Information

Transit Center, Measures for Success: New Tools for Shaping Transportation Behavior, <http://transitcenter.org/wp-content/uploads/2017/07/TDM-paper.pdf>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.1: Increase bicycle use through encouragement of bicycling as safe, convenient, affordable, and fun.

3.1 B: Expand programs and relationships with community organizations to get bicycles to people.

Description

Continue to develop programs and relationships with community organizations to get bicycles to people who want to bicycle. This could mean establishing a fleet of bikes for state employees and legislators, bike share programs, or Build-a-Bike Programs. Build-a-Bike programs, such as those run by the Urban Bike Project in Wilmington can help low-income people and young people gain access to affordable transportation options

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes, to be determined

Stakeholders

Lead: DBC

Support: community bicycle organizations

Additional Information

Urban Bike Project, <http://www.urbanbikeproject.com/>

Newark Bike Project, <https://newarkbikeproject.org/>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.1: Increase bicycle use through encouragement of bicycling as safe, convenient, affordable, and fun.

3.1 C: Build awareness of bicycling, active transportation, and related resources among the public through targeted information dissemination and outreach.

Description

Individualized marketing programs are education and outreach efforts that are tailored to an individual's needs and interests instead of providing general information to the masses. The approach is based on the theory that people are more likely to try something new if it fits practically into their daily lives and improves how they do something, such as traveling or getting exercise.

Individualized marketing and other targeted outreach could, for example, be used to promote use of a new or underutilized trail to residents that live nearby by calling attention to different benefits and aspects of the trail depending on the individual being addressed. One nearby resident might receive information on the health benefits of bicycling, while another would get information about bicycling as a low-cost travel mode.

Implementation of this strategy should include outreach to populations that are traditionally underserved and underrepresented in public engagement efforts, including individuals in one or more of the following categories: low income, minority, older adults, limited English proficiency, or persons with disabilities.

These approaches are commonly implemented through web-based technology, but can also be implemented through other means, such as postal mail. For example, utility bills can be an efficient option to reach people who do not have regular access to the internet.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: No

Stakeholders

Lead: DBC

Support: MPOs, counties, municipalities, community organizations, bicycle advocacy organizations

Additional Information

Oregon DOT, <http://www.oregon.gov/ODOT/Planning/Documents/Mosaic-Individualized-Marketing-Programs.pdf>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.1: Increase bicycle use through encouragement of bicycling as safe, convenient, affordable, and fun.

3.1 D: Increase end-of-trip facilities, such as showers, fix-it stations, camp grounds, and bike parking.

Description

Increase the amount of bike-friendly infrastructure – both public and private – along routes and at destinations, including showers, fix-it stations, camping, conveniently located and safe bicycle parking, etc. Starting with investments and policy requirements at government buildings and on key bicycle corridors, such as the Junction & Breakwater Trail and the Markell Trail. Coordinate implementation with local bicycle plans.

Timeframe: Once initiated, this will take approximately 1–2 years, ongoing to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes, to be determined

Stakeholders

Lead: DBC

Support: MPOs, counties, municipalities

Additional Information

Bike-friendly lodging, Explore Minnesota, <http://www.exploreminnesota.com/pedal-mn/articles/bike-friendly-lodging-minnesota/>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.2: Increase awareness/understanding/coordination of statewide bicycle resources.

3.2 A: Develop a centralized, easy-to-use, bicycle-focused website to serve all stakeholders.

Description

Create a centralized, easy-to-use bicycle-focused website to host key information and links to relevant resources to support bicycling in the state. The public and other stakeholders have indicated a desire to be able to link to a single site rather than different stakeholders generating their own content. A central website will improve information consistency and decrease confusion.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DeIDOT Planning

Support: DBC

Additional Information

Washington bicycle site, <http://www.wsdot.wa.gov/bike/>

Minnesota bicycle site, <http://www.dot.state.mn.us/bike/>

Pennsylvania bicycle site, <http://www.penndot.gov/TravelInPA/RideaBike/Pages/default.aspx>

Denver, CO Multimodal Accessibility Plan, <https://www.denvergov.org/content/denvergov/en/mayors-office/programs-initiatives/mobility-action-plan.html>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.2: Increase awareness/understanding/coordination of statewide bicycle resources.

3.2 B: Create and disseminate *Blueprint* toolkit materials and hold trainings and educational opportunities for stakeholders to learn about the latest resources, processes, and activities.

Description

Create and disseminate *Blueprint* toolkit materials that boost awareness and understanding of processes and foster efficiency and coordination. This integrates with the website and other products of this *Blueprint*. Information to be disseminated includes the local planning process summary, the project prioritization summary, supporting materials, local planning resources, funding information, the project development process/checklist, bicycle facility policy, and bicycle facility design guidance.

DelDOT staff should receive training on the bicycle plan and its recommendations. Other plan stakeholders, including local governments, should also receive the training. Consider conducting training by webinar for efficiency and accessibility.

Material should be regularly reviewed and updated to reflect progress, new policies/processes, and new resources

Timeframe: Once initiated, this will take approximately <1 year, ongoing to complete

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: DelDOT Planning

Support: DBC, DNREC, MPOs, counties, municipalities

Additional Information

See *Blueprint* resources and toolkit

VDOT's Local Technical Assistance Program (LTAP), <http://www.cts.virginia.edu/about-tta/>

PennDOT training learning objectives, https://www.dotdom1.state.pa.us/ecms/ecms_training_calendar.nsf/c0967cfd97308a3d85257847005a1fe0/e5f1e8333c98577b85257fab00627aa5?OpenDocument

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.2: Increase awareness/understanding/coordination of statewide bicycle resources.

3.2 C: Provide local maps that guide bicyclists to destinations along comfortable routes.

Description

Provide local maps – print and online – that guide bicyclists to desirable routes and destinations of interest. DeIDOT develops and publishes state-level maps, including a Low Traffic Stress route map.

Going forward, State agencies should coordinate with local governments, tourism entities, and community/non-profit groups to develop localized maps. For example, DeIDOT works with the Delaware Office of Tourism to develop maps and apps to attract and guide visitors to popular activities and destinations, such as the Outdoor Trail map/app, and DNREC has developed the PlayOutsiDE map/app to guide residents and visitors to trails and other recreational resources. Entities like the Division of Public Health (DPH) could support distribution and promotion to the public.

The State should consider providing small grants for local communities to produce maps. State agencies and other organizations should also consider coordinating on map development as part of the bicycle network planning process (See 1.1 D); support for local map development may be an incentive the State could offer to encourage local planning.

Timeframe: Once initiated, this will take approximately 1–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes

Stakeholders

Lead: DeIDOT Planning

Support: DNREC, DPH, counties, municipalities, tourism/commerce entities, community organizations, bicycle clubs, bicycle advocacy organizations – these entities would be responsible for funding; DBC – identify needs/opportunities, funding, and help with coordination

Additional Information

Minnesota, <http://www.exploreminnesota.com/pedal-mn/>

Philadelphia, <https://gophillygo.org/>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.2: Increase awareness/understanding/coordination of statewide bicycle resources.

3.2 D: Ensure bicycling is included in planning for autonomous vehicles.

Description

Technologies are quickly changing related to autonomous vehicles and other innovations. These will have dramatic effects on transportation priorities, operations, land use, and safety in the coming years. Agencies should evaluate and plan for opportunities to use new technology such as autonomous vehicles, data collection technology, and apps, for achieving bicycle goals to develop a proactive strategy.

Timeframe: ongoing

Implementation Priority Level: Low

Additional Resources Needed: No

Stakeholders

Lead: DelDOT-All Divisions; Advisory Council on Connected and Autonomous Vehicles

Additional Information

IEEE article on self-driving vehicles and bicycles, <https://spectrum.ieee.org/transportation/self-driving/selfdriving-cars-have-a-bicycle-problem>

Goal 3. Foster a Culture of Cycling that Broadly Benefits Delawareans

Objective 3.2: Increase awareness/understanding/coordination of statewide bicycle resources.

3.2 E: Implement the bicycle count program and publish the data.

Description

Collecting data on bicycling and active transportation is critical to having a clearer understanding of bicycling, demand for bicycling, and use and value of related infrastructure investments. Better data can improve planning, lead to better investment decisions and more investment, and ultimately improve the bicycle network. Data can also increase awareness and understanding.

DeIDOT currently has a bicycle and pedestrian count program and implementation guide. The program has been initiated and is still in early phases. In partnership with a variety of other stakeholders, DeIDOT should continue implementation of the count program and also expand coordination and awareness of the program to maximize data availability and associated benefits.

Implementation of this recommendation should include increasing the number of physical counters deployed, establishing an online display of bicycle and pedestrian count data, and establishing a physical counter in a highly visible location (see images below).

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes

Stakeholders

Lead: DeIDOT Planning

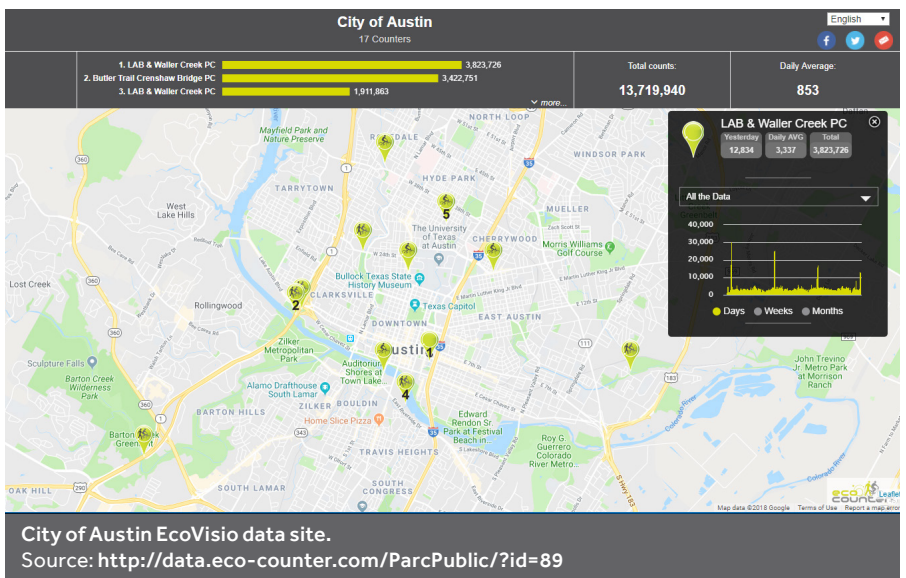
Support: DeIDOT DOTS

Additional Information

DeIDOT’s Bicycle and Pedestrian Count Program Report / Guide

Austin, Texas Bicycle Count EcoVisio data site, <http://data.eco-counter.com/ParcPublic/?id=89>

DVRPC public count website, <http://www.dvrpc.org/webmaps/pepbikecounts/>



Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.2: Increase awareness/understanding/coordination of statewide bicycle resources.

3.2 F: Monitor and encourage implementation of the *Blueprint*.

Description

The Delaware Bicycle Council should monitor and encourage implementation of the *Blueprint for a Bicycle-Friendly Delaware* and foster coordination. A status report should be published annually to track progress and a 6 month interim report should also be considered. Preparation of these reports may be done by DeIDOT Planning or a hired consultant.

The Council was established in May 1990 by House Bill 505 to “consider, review and work on matters pertaining to bicycling, bicycle safety and bicycle safety education and to make recommendations to various state agencies.” Over the years, the Council’s approach and activities have changed. While the Council and its members are actively involved in carrying out this role, the group’s work focuses on administering the Bicycle Innovation Grant program and responding to other bicycle-related issues brought forth by its members. The Council, with its range of membership and current role, would be an organization well-suited to oversee and monitor implementation of the *Blueprint*, and may also benefit from using the plan to guide and focus it’s work.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: To be determined

Stakeholders

Lead: DBC, bicycle advocacy organizations (e.g. Bike Delaware)

Support: DeIDOT Planning, all agencies with responsibilities in bicycle-related programs

Additional Information

Current Delaware Bicycle Council website, https://deldot.gov/Programs/bike/biking_in_delaware/

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.2: Increase awareness/understanding/coordination of statewide bicycle resources.

3.2 G: Increase diversity of the Delaware Bicycle Council to represent the diverse population of Delaware.

Description

The governor-appointed Council is made up of representatives from across the state and includes both volunteer participants from the public as well as agency representatives. The Council maintains representation from all three counties, however, diversity of the group in other aspects is very limited. Membership is predominantly male and people of middle age or older. Achieving an encompassing vision for a bicycle-friendly state, as outlined in this plan, and successfully addressing and implementing the broad-range of objectives and recommendations in this plan will require additional and different perspectives. The Council should consider adding members from other important stakeholder organizations, such as the three county governments, as well as engaging members of different backgrounds.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: To be determined

Stakeholders

Lead: DBC

Support: DeIDOT Planning, bicycle advocacy organizations

Additional Information

Current Delaware Bicycle Council website, https://deldot.gov/Programs/bike/biking_in_delaware/

Goal 3. Foster a Culture of Cycling that Broadly Benefits Delawareans

Objective 3.3: Increase number and distribution of bicycling organizations and events statewide to encourage bicycling for fun, fitness, and transportation.

3.3 A: Expand and increase events that promote bicycling.

Description

At least 10 organized National Bike Month events occurred across the state during 2017. These formal events along with less formal events/rides that are not as easily tracked, contribute to promoting a culture of cycling throughout Delaware, raising awareness among bicyclists as well as people who may not currently ride

The Delaware Bicycle Council, Bike Delaware, and other bicycle advocacy groups should encourage and support coordination of government agencies, elected officials, and community groups to establish and promote bicycle related events. One approach may be to annually convene the full range of stakeholders, such as state and local tourism entities, Downstate Striders and Riders, Bike Newark, the National Multiple Sclerosis Society, Delaware Greenways, Delaware Technical Community College, Motivate the First State, and many others to explore ways that the organizations who run bicycle related events in Delaware can work cooperatively in the following year to promote, cross-market and grow those events in order to promote a culture of cycling throughout Delaware. While an individual organization may have narrow interest in bicycling—for example as a form of low-cost transportation, or tool for health improvement, or a fundraising activity—general promotion of bicycling can serve to collectively promote these individual interests.

As such efforts proceed, a system for tracking/reporting on these events should be integrated with performance measurements.

Timeframe: Once initiated, this will take less than a year to complete, with ongoing activities

Implementation Priority Level: High

Additional Resources Needed: No

Stakeholders

Lead: Delaware municipalities, counties, bicycle advocacy organizations, Bike Delaware, community bicycle organizations, bicycle shops, bicycle clubs, and more.

Support: DeIDOT Planning, DPH, DBC, tourism entities

Additional Information

National Bike Challenge, <https://www.lovetoride.net/usa>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.3: Increase number and distribution of bicycling organizations and events statewide to encourage bicycling for fun, fitness, and transportation.

3.3 B: Offer resources and incentives for bicycle-supportive community organizations.

Description

Offer resources and incentives for bicycle-supportive community organizations, including:

- hosting networking events
- sharing best practices
- local grant funding opportunities

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes, to be determined

Stakeholders

Lead: MPOs, community bicycle organizations, bicycle advocacy organizations (e.g. Bike Delaware)

Support: DBC, WILMAPCO Nonmotorized Transportation Working Group (overlapping interest, this topic arose during a 2017 meeting)

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.3: Increase number and distribution of bicycling organizations and events statewide to encourage bicycling for fun, fitness, and transportation.

3.3 C: Increase number of mobile bike repair and safety clinics, bike rodeos, Safe Routes to School programs, and other events in communities throughout the state.

Description

Mobile bike repair and safety clinics, bike rodeos, Safe Routes to School programs, and other operations and safety focused events encourage safety and confidence of bicyclists and raise awareness. These activities can lead to an increase in new riders (especially among younger or those new to riding) and increased frequency among people who already ride.

A statewide strategy should be established and coordinated with local bicycle planners and community organizations.

Timeframe: Once initiated, this will take less than a year to complete, with ongoing activities

Implementation Priority Level: High

Additional Resources Needed: Yes, to be determined

Stakeholders

Lead: DelDOT, community bicycle organizations

Support: MPOs, counties, municipalities, Department of Education, DBC (i.e. funding), community bicycle organizations, bicycle shops

Additional Information

Delaware Safe Routes to School Program, <https://deldot.gov/Programs/srts/>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.4: Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DelDOT and beyond.

3.4 A: Establish a variety of formal training opportunities for DelDOT staff.

Description

Establish a variety of formal training opportunities for DelDOT staff, including:

- in-state conferences
- training rides that offer professional development credits
- technical training on policies and design guidance
- technical training for special/high priority facilities (e.g. protected bike lanes)
- field trips
- on-bicycle skills training

While this recommendation has most relevance for DelDOT—the agency that currently has the greatest degree of responsibility for decisions that directly influence bicycling—other agencies, such as municipalities, public works, and parks departments should be included. Coordinate with other entities that have roles impacting bicycling.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DelDOT Planning

Support: bicycle advocacy organizations (e.g. Bike Delaware)

Additional Information

PennDOT training learning objectives, https://www.dotdom1.state.pa.us/ecms/ecms_training_calendar.nsf/c0967cfd97308a3d85257847005a1fe0/e5f1e8333c98577b85257fab00627aa5?OpenDocument



Source: Derek Sapp, DelDOT

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.4: Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DelDOT and beyond.

3.4 B: Develop partnerships to engage students and the public in implementation of non-motorized count programs and surveying.

Description

Develop partnerships with local post-secondary programs to engage students in implementation of non-motorized count programs. This should involve technical schools in the bicycle and pedestrian counter program management as well as other engineering and planning programs. Such partnerships could help foster identification and use of new technology, such as smartphone apps and other data mining methods, as well as support workforce development efforts in the state.

While automated count technology is often more desirable, due to efficiencies, uniformity, and easier coordination, manual bicycle and pedestrian counts/surveys can be helpful, especially in early program establishment. Manual counts and intercept surveys done by trained individuals (e.g. community volunteers) are also valuable for collecting qualitative data (type of bicycle, people walking or rolling with assisted devices, helmet use, etc.), identifying and validating volumes at a site, and counting in chaotic environments like a festival or fair.

This program may also include partnerships with local community organizations, such as Delaware Greenways, Urban Bike Project, and others.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: No

Stakeholders

Lead: DelDOT Planning

Support: Community bicycle organizations, DelDOT Traffic, post secondary educational organizations

Additional Information

TRB Bicycle and Pedestrian Data Subcommittee, <https://sites.google.com/site/bikepeddata/>

MnDOT Count Manager Training, <http://www.dot.state.mn.us/bike/research/documents/2015-CountManagerTraining.pdf>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.4: Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DelDOT and beyond.

3.4 C: Reflect *Blueprint for a Bicycle-Friendly Delaware* in state and local planning documents and reference in online planning tools and resources.

Description

To improve awareness and application of bicycle policies, guidelines, and planning tools, the contents of the *Blueprint for a Bicycle-Friendly Delaware* should be reflected in other planning documents, including the LRTP update, comprehensive plans, MPO regional/long range plans, and area wide/corridor plans. Plans should be updated and shared.

Timeframe: Once initiated, this will take less than a year to complete, with ongoing updates

Implementation Priority Level: Moderate

Additional Resources Needed: No

Stakeholders

Lead: OSPC

Support: DelDOT Planning, MPOs, counties, municipalities, U of D IPA

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.4: Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DelDOT and beyond.

3.4 D: Fund and promote a Living Laboratory program.

Description

The purpose of a Living Laboratory Program is to systematically test street designs that will help achieve goals established by the *Blueprint*. Pilot test projects are carefully studied to make quick design improvements and measure the safety and ridership benefits of projects.

DelDOT should fund and promote a Living Laboratory research program to support testing and implementation of new treatments, techniques, materials, and creative solutions. For example, the City of Boulder's Living Laboratory program tested dashed bike lanes, protected bike lanes including parking-protected bike lanes, back-in angled parking, buffered bike lanes, bike boulevards, and bike boxes.

Timeframe: Once initiated, this will take approximately 2–3 years to complete

Implementation Priority Level: High

Additional Resources Needed: Yes

Stakeholders

Lead: DelDOT Planning

Support: Delaware Center for Transportation, DelDOT Traffic

Additional Information

Boulder, CO, Living Laboratory, <https://boulder.colorado.gov/goboulder/living-lab-overview>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.5: Establish consistent, uniform, coordinated data gathering and management across agencies that leverages existing data and provides value to all interested stakeholders in their efforts to improve processes, systems, and programs.

3.5 A: Formalize data coordination efforts across and within agencies.

Description

The state should formalize data coordination efforts across and within agencies, including:

- Comprehensive listing of data collected (by which entity)
- Scheduled updates and regular sharing, if not real-time updates
- Performance measures
- Crash, GIS, bike/ped count data, etc.

Data on bicycling rates and safety should be shared with other disciplines and agencies (health, environment, etc.).

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: To be determined

Stakeholders

Lead: DelDOT Planning, OSPC, DNREC

Support: MPOs, counties, municipalities, DBC (i.e. feedback)

Additional Information

<https://www.fhwa.dot.gov/publications/research/safety/pedbike/96104/>

Connecticut Crash Data Repository (CTCDR), <https://www.ctcrash.uconn.edu/>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.5: Establish consistent, uniform, coordinated data gathering and management across agencies that leverages existing data and provides value to all interested stakeholders in their efforts to improve processes, systems, and programs.

3.5 B: Collect bicycles-on-transit data.

Description

Data should be collected on bicycles-on-transit usage, including number of bicycles on bus racks and the number of bike racks available and in use at transit stations and bus stops.

Some data is already collected, but not analyzed and used to its full potential. Additional data processing to convert data to a more user-friendly GIS format and data dissemination is needed.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DTC

Support: DeIDOT Planning

Additional Information

Bikes-on-racks counter, <https://www.sportworks.com/product/bike-counter>

Charlottesville, VA, <http://www.cvilletomorrow.org/news/article/20652-cat-farebox-demonstration/>



Source: WRA

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.5: Establish consistent, uniform, coordinated data gathering and management across agencies that leverages existing data and provides value to all interested stakeholders in their efforts to improve processes, systems, and programs.

3.5 C: Make pedestrian and bicycle data collection part of the project development process, both at project scoping and after construction to assess impacts and benefits.

Description

Until 2016, when the Delaware Bicycle and Pedestrian Count Program study and associated Report/Guide were published, bicycle and pedestrian data did not have a standard process for collection in Delaware. This data collection program is underway and it will establish a baseline of data for bicycle and pedestrian modes, which can be used to inform the non-motorized component of the state's travel demand model, enable extrapolations and data correction for subsequent bicycle and/or pedestrian counts conducted by any entity in the state, and provide regular data points for benchmarking and performance measurement.

In addition to conducting counts specifically focusing on bicycles and pedestrians in locations identified in the Bicycle and Pedestrian Count Program Guide, there may be other opportunities to collect data on bicycles and pedestrians as part of roadway or intersection counts through other initiatives/programs at DeIDOT. These other programs should be considered as sources of pre-construction and post-construction data that can contribute to better understanding of these modes.

DeIDOT should develop a process whereby non-motorized data can be collected in addition to other count data, as part of the project development process. Coordination across DeIDOT divisions and other State and local agencies will enhance efficiencies. It is especially important to collect data after construction, as this is rarely done.

Timeframe: Once initiated, this will take approximately 1–2 years to complete

Implementation Priority Level: Low

Additional Resources Needed: To be determined

Stakeholders

Lead: DeIDOT Planning

Support: MPOs, counties, municipalities, other DeIDOT divisions

Additional Information

DeIDOT Traffic Counts, https://www.deldot.gov/Publications/manuals/traffic_counts/?dc=2002

Delaware Bicycle and Pedestrian Count Program Guide (2016), https://www.deldot.gov/information/projects/pdf/2016/DeIDOT_Count_Program_Guide.pdf

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.5: Establish consistent, uniform, coordinated data gathering and management across agencies that leverages existing data and provides value to all interested stakeholders in their efforts to improve processes, systems, and programs.

3.5 D: Establish and update bicycle performance metrics and targets over time.

Description

A list of performance measures is part of the *Blueprint*. There may be additional specific measures that should be identified and tracked as some recommendations are implemented. Uniform and coordinated data collection/sources, methods, and tracking mechanisms should be established to ensure measures are accurate and comparable over time.

Timeframe: Once initiated, this will take less than a year to complete

Implementation Priority Level: High

Additional Resources Needed: To be determined

Stakeholders

Lead: DelDOT Planning

Support: DBC

Additional Information

See *Blueprint* performance measures summary

Guidebook for Developing Pedestrian and Bicycle Performance Measures, https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/performance_measures_guidebook/

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.6: Increase appreciation for and leveraging of bicycling and its broad benefits throughout Delaware.

3.6 A: Produce a comprehensive Return on Investment Report that quantifies the broad benefits of bicycling to the public.

Description

Produce a comprehensive Return on Investment Report that identifies the broad benefits of bicycling to the public in Delaware, including economic, health and environmental impact studies.

Timeframe: Once initiated, this will take approximately 2–3 years to complete

Implementation Priority Level: Moderate

Additional Resources Needed: Yes

Stakeholders

Lead: DeIDOT Planning

Support: DBC (i.e. feedback)

Additional Information

Minnesota economic and health impact study, <http://www.dot.state.mn.us/research/TS/2016/201636.pdf>

Wisconsin economic impact study: <http://wisconsindot.gov/Documents/travel/bike/econ-impact.pdf>

Goal 3. Foster a Culture of Bicycling that Broadly Benefits Delawareans

Objective 3.6: Increase appreciation for and leveraging of bicycling and its broad benefits throughout Delaware.

3.6 B: Incorporate bicycling goals and other elements of this plan into related plans and policies.

Description

To increase appreciation for bicycling and its broad benefits, incorporate bicycling goals and other elements of this plan into related plans and policies, such as:

- recreation plans
- comprehensive plans
- agency/organizational work plans and strategic plans

Timeframe: Ongoing

Implementation Priority Level: Moderate

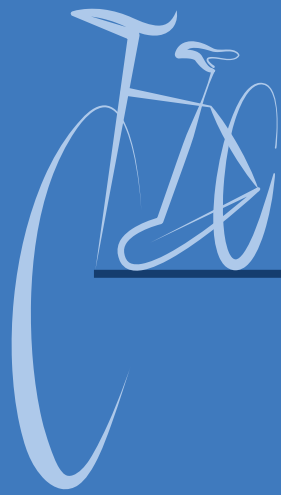
Additional Resources Needed: No

Stakeholders

Lead: OSPC

Support: DeIDOT - all divisions, MPOs, counties, municipalities, DBC

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Part 3

Toolkit

Local Bicycle Network & Project Planning

How locally-identified projects build a connected bicycle network in Delaware

Introduction

This section of the *Blueprint for a Bicycle-Friendly Delaware* describes the process by which bicycle projects are developed and how they can be funded through the Statewide Bicycle and Pedestrian Program. (While the local planning step will support coordination across project planning generally, other programs that fund bicycle infrastructure have their own requirements and processes.)

What's new in this plan? Bicycle projects in Delaware have often been initiated at the state level in coordination with local partners. Under this *Blueprint*, bicycle plans and projects that seek state funding will be developed through a participatory, locally-driven planning process that results in a formal plan. This change is intended to ensure that investment in bicycle infrastructure is driven by local needs and priorities. The state will prioritize locally-driven projects to ensure that they are cost-effective, feasible, and connected to regional and statewide networks.

The intended audiences for this content are:

- DelDOT and other statewide agency and organization staff
- Local and regional planners
- Local government leaders
- Non-profit entities and bicycle advocacy groups
- Private organizations
- Members of the public interested in bicycle network planning

Network Planning

Most bicycle trips are quite short—five miles or less—and are primarily for local trips and activities.

For that reason, planning for bicycling, even by a state agency, is best done in close coordination with local

The Local Planning Process supports the following goals in the *Blueprint for a Bicycle-Friendly Delaware*:

- 3.1.5** Increase funding options and strategic partnerships for network investment.
- 3.2** Increase awareness/understanding/coordination of statewide bicycle resources.
- 3.4** Improve awareness and application of bicycle policies, guidelines, and planning tools throughout DelDOT and beyond.
- 3.5** Establish consistent, uniform, coordinated data gathering and management across agencies that leverages existing data and provides value to all interested stakeholders in their efforts to improve processes, systems, and programs.

agencies and stakeholders. The *Blueprint for a Bicycle-Friendly Delaware* establishes a locally-driven planning process that is supported and facilitated at the state level.

The goals of this planning and project prioritization process and supporting materials are to:

- Develop locally-driven and generated plans and projects, so that once projects get in the queue for funding, local support has been established and projects more easily move forward
- Establish a full queue of bicycle and trail projects that accomplish state and regional goals and vision
- Publicize a transparent and easy-to-understand process by which bicycle facility project ideas are considered, funded, and constructed by DelDOT²
- Make information clear and accessible so stakeholders have the information necessary to be part of implementing the *Blueprint*

² Other agencies also fund/construct projects.

Figure 3-A: Goals of Planning and Project Prioritization Process

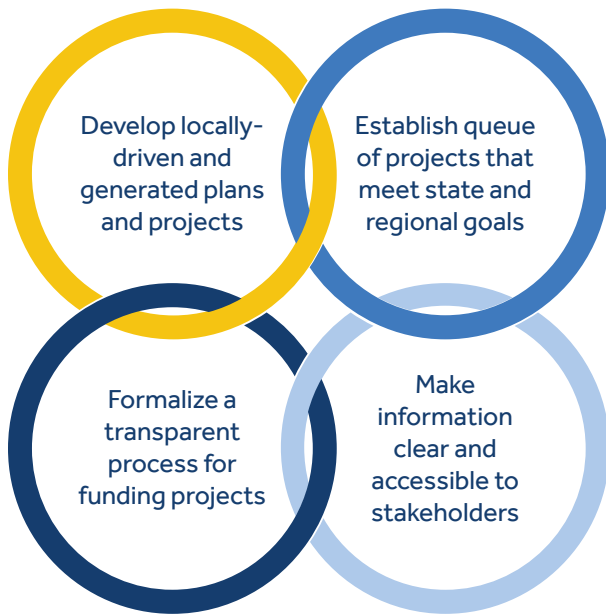


Figure 3-B: Local, Regional, and State Summary



Local, Regional, and State Planning Summary

Projects go through the following process to be prioritized for the Statewide Bicycle and Pedestrian Program:

1. Local Municipalities:

- Project Identification: Projects are identified as part of a planning process³
- Submittal: Projects are sent to be included in regional plans⁴

2. Regional Entities⁵:

- Project Incorporation: Metropolitan Planning Organizations (MPOs) and Sussex County incorporate locally-identified projects into regional plans⁶
- Submittal: (no formal application is required, but each regional entity may decide how to ensure there is continued local support and the project is still appropriate)
- All projects are submitted to DeIDOT via GIS for inclusion in the statewide planned project map
- Projects ranked highly at the regional level are submitted to DeIDOT for statewide ranking
- Coordinate local agency or community commitment

3. DeIDOT:

- Meets with MPOs and Sussex County to discuss preliminary regional project priorities
- Conducts initial feasibility screening
- Updates Projects of Statewide Significance
- Prioritizes projects
- Announces funded projects
- Releases GIS data and statewide map of all planned project
- Evaluates projects and audits process for future refinement

3 In some cases, local plans may be developed through an MPO or other regional planning process.

4 Local governments may fund projects with local or private funds. This process is for projects pursuing Statewide Bicycle and Pedestrian Program funds.

5 "Regional Entity" refers to WILMAPCO, the Dover/Kent MPO, and Sussex County. DeIDOT will support planning efforts in Sussex County.

6 In addition to the regional bicycle, pedestrian, or active transportation plan, projects on the regionally prioritized list may come from planning documents such as the ones identified in the planning efforts list.

Figure 3-C: Local Planning Resources

 Additional Resources	 Local Planning Capacity	 Online Data
<p>Links to information to support bicycle planning in Delaware.</p> <p>See Additional Resources at the end of this section.</p>	<p>The State should provide local governments with direct planning assistance through State Planning & Research (SPR) funds, the hiring of consultants, or direct planning support.</p>	<p>DeIDOT will provide consolidated publicly available data through its Gateway website to support local planning efforts.</p> <p>http://firstmap.delaware.gov/</p>

Policy and Process Details

Local and Regional Planning

Projects should be proposed and vetted during the local and regional planning processes. Individuals, community groups, and planners should all help to identify safety issues, network gaps, challenges, and opportunities. Non-profits, private entities, and non-traditional partners should be involved.⁷ Robust public input at this stage means that projects have local support and delays may be avoided later in the process.

A variety of planning efforts that include public engagement may be used to identify projects. Those include but are not limited to the following:

- Bicycle Master Plans
- Pedestrian Master Plans (e.g. for shared use path recommendations)
- Greenway Plans and Trail Master Plans
- Parks Plans
- Comprehensive Plans
- Official Local Government Maps
- Small Area, Regional, or Community Master Plans
- Transit Access Plans
- Corridor Studies and Plans
- Comprehensive Outdoor Recreation Plans

Projects are identified as part of one of these planning processes and may be included in a regional bicycle plan. Projects may be prioritized locally or submitted to the region for prioritization. Using GIS mapping as part of planning is advised so that existing and proposed facilities may be overlaid to evaluate network connectivity and to enable regional and statewide integration.

Regional entities collect local projects and submit high value projects to DeIDOT to be considered for funding for the Statewide Bicycle and Pedestrian Program. All projects should be submitted to DeIDOT via GIS to be added to the statewide planned project map.

DeIDOT does not require a formal application for this program. However, the MPO/regional entity should check with local entities before submitting priority projects to ensure the project is still viable in terms of local support, championing, and value. The regional entity may choose to have its own process to address this aspect.

⁷ These entities may be able to raise and leverage funding to support development of off-road trail systems on land they control, which can serve as important linkages between destinations and the statewide trail systems. These organizations may also provide funding and in-kind matches via environmental stewardship, education, and trail maintenance. Non-profits – YMCA of Delaware, Boys/Girls Clubs of DE, Delaware Greenways, Delaware Nature Society, school districts, institutes of higher education, local community centers, trail clubs, etc. Private organizations – such as new 87ers arena, new DE Turf Sports Complex, planned recreational complex in Georgetown, etc. Non-traditional partners – such as healthcare providers/industry, tourism and visitors’ bureaus, chambers of commerce, etc.

DeIDOT Steps

1. DeIDOT Meetings with MPOs and Sussex County

Each year, DeIDOT will meet with WILMAPCO, the Dover/Kent County MPO, Salisbury/Wicomico MPO, and Sussex County to review the region's preliminary project list and walk through DeIDOT's feasibility screening process to ensure submitted projects are implementable and cost-effective. The primary purpose is to assess projects for the Statewide Bicycle and Pedestrian Program, but projects may be directed to other funding sources as appropriate.

The meeting will also address project costs. Funding for bicycle facilities is limited and project cost will be considered during DeIDOT's feasibility screening. Local and regional agencies should consider total project costs and overall cost-benefit in their prioritization.

The cost of a project must not exceed the total funding available for the funding program (for example, the expected annual funding for the Statewide Bicycle and Pedestrian Program is in the range of \$7.5 million). Projects should be significantly lower than this ceiling to allow for more projects to be funded. Larger projects (i.e., projects exceeding \$3-5 million) are more likely to be filtered out or delayed during the feasibility screening stage.

DeIDOT understands that large, more costly projects that exceed these maximums may be critical to the completion of a low-stress bicycle or trail network. Premier projects, such as the Markell Trail, may require a strategy outside of the usual funding channels. DeIDOT will work with local and regional agencies to develop such a strategy. This might include competition for Capital Transportation Program funds, the use of private funds, phased implementation, and/or other strategies.

2. Initial Feasibility Screening

DeIDOT conducts a feasibility analysis on the high value projects from each region. The number of projects reviewed will be limited and depend on DeIDOT capacity and overall funding available for the program. DeIDOT may hire a consultant to conduct the analysis.

The analysis considers factors that impact the cost of a project such as:

- Right-of-way acquisition
- Utilities
- Environmental considerations
- Other issues that may affect project feasibility

The result will be a brief summary of the project's feasibility intended to filter out infeasible projects.

3. Projects of Statewide Significance Update

DeIDOT may develop and update a list of Projects of Statewide Significance. These are typically large trail projects, but may include important on-street facilities. Several Projects of Statewide Significance are underway, including the Newark to Wilmington Trail, the Capital City Trail loop and Senator Bikeway in Dover, and the Lewes to Georgetown Trail.

Future Statewide Priority Projects will be developed by DeIDOT staff:

- In coordination with regional planning efforts (It is anticipated that these projects are or will be identified in regional plans)
- Based on DeIDOT's goals and priorities, including those in the *Blueprint*

4. Project Prioritization

Projects that are identified for funding through the Statewide Bicycle and Pedestrian Program go through a prioritization process that is documented in more detail beginning on page 106.

5. Local Agency or Community Commitment Confirmation

Effective implementation of bicycle projects requires local support and involvement. Although projects will be generated through a local planning process and therefore will have been vetted by the public and local officials, time can pass between the initial planning and project funding and implementation. Therefore, this *Blueprint* suggests that regional agencies establish a method to ensure local agencies make some basic commitments to support projects in their jurisdictions. Although DeIDOT does not require any formal application to be submitted for this funding program,

regional entities may choose to request from the local community:

- a letter of support for the project
- support for public outreach for the project, possibly including staff time, a venue, and promotion of public events
- agreement to support maintenance if requested by DeIDOT or another state agency (Note: DeIDOT has a maintenance policy, which defines which facilities it maintains and the specific maintenance work it conducts.)

6. Project Funding Announcement

DeIDOT will notify regional and local governments about funded projects and publish the complete list for the public.

Project agency leads—such as DeIDOT Planning, Division of Transportation Solutions (DOTS), or Maintenance and Operations (M&O)—are determined based on factors including the funding source and amount, staffing availability and expertise for the features of the project, and other projects in the pipeline that may lead to other partnerships and coordination efficiencies.

7. GIS Data and Statewide Map of Planned Projects

DeIDOT will create a GIS map of proposed and prioritized projects and existing data. The map will serve as a resource for local planning, the Division of Transportation Solutions (DOTS) on-road project prioritization, development coordination, and statewide planning efforts.

Additional GIS layers provided through the system should include:

- Existing trails and on-road facilities
- State priority trails
- Level of traffic stress bicycle network connectivity data
- A map that overlays state planning strategy areas over local priority project locations (<http://stateplanning.delaware.gov/strategies/>)
- Data related to equity, such as zero-car households, low-income areas, demographic data, public health indicators (e.g. obesity rates), locations of essential services
- Indicators of likely demand (origins and destinations, trip generators, etc.)

8. Project Evaluation and Process Audit

The distribution of funds will be based on the regional priorities submitted to DeIDOT and the completion of statewide priority trail projects. DeIDOT will pursue a distribution that serves the entire state, including urban, suburban, and rural contexts. DeIDOT will periodically publish a review of the distribution of the Delaware Statewide Bicycle and Pedestrian Program funds that will help ensure fair distribution over time. Rather than setting an annual percent distribution of funds to each geographic area, this strategy is intended to promote fair funding distribution over time while enabling more efficient project funding and delivery.

DeIDOT performance safety measures focus on DeIDOT's bicycle network goals (connectivity, comfort, condition of facilities) as well as broader measures such as increase in mode share, increase in low-stress connections, and increase in connectivity to important destinations.

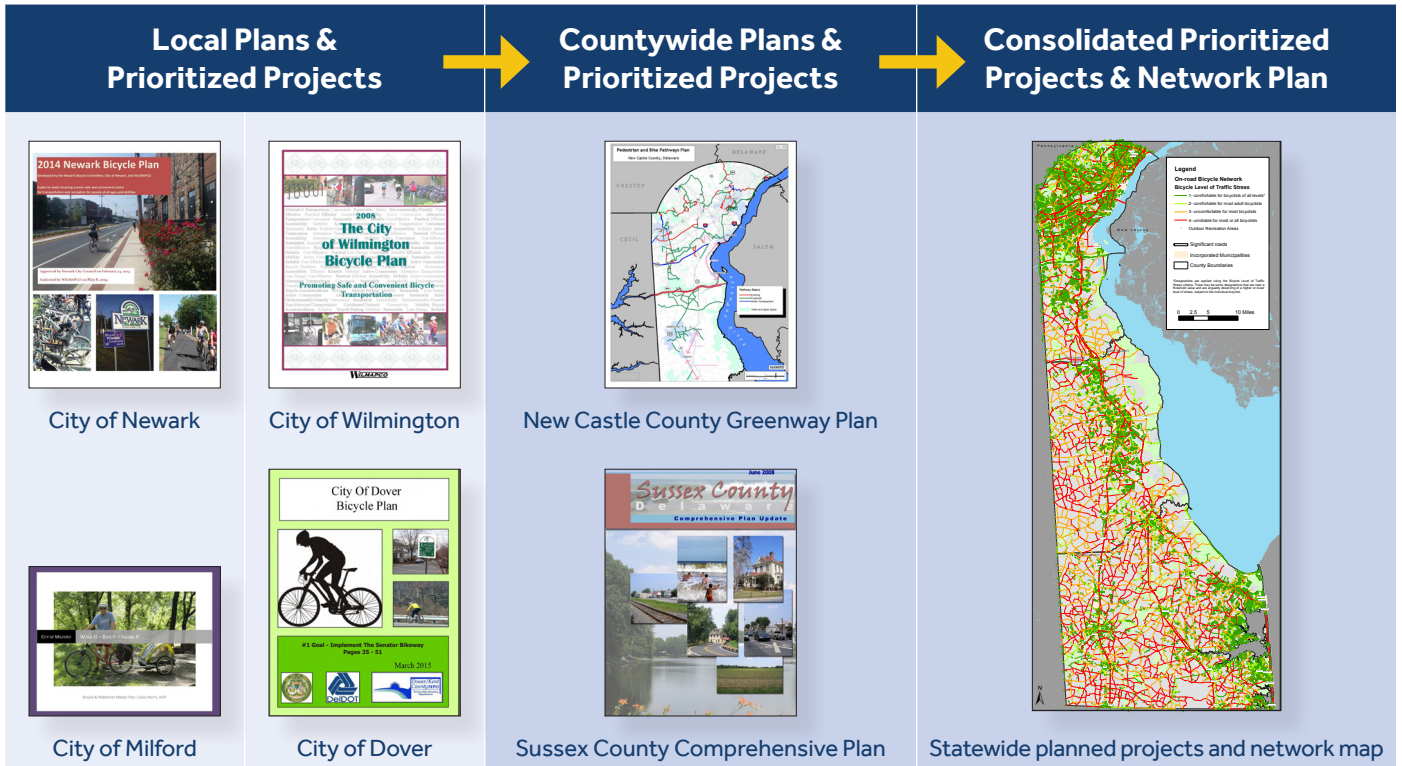
Note that equity is a key principle of bicycle planning in Delaware. Although this *Blueprint* does not set requirements for local prioritization processes, DeIDOT and this *Blueprint* strongly recommend that local and regional agencies use their prioritization processes to ensure that bicycle networks support transportation options and safety for traditionally underserved communities, including low-income, minority, and limited English proficiency populations. Useful resources include:

- Health and Equity Analysis of City of Dover and Kent County Regional Bicycle and Pedestrian Plans (<http://deplan4health.org/wordpress/wp-content/uploads/2016/12/Final-Delaware-Health-and-Equity-Analysis-Bike-Report.pdf>)
- Pursuing Equity in Pedestrian and Bicycle Planning. FHWA. April 2016. (https://www.fhwa.dot.gov/environment/bicycle_pedestrian/resources/equity_paper/)
- Additional resources developed through Delaware's Plan4Health Initiative (<http://deplan4health.org/wordpress>)

Figure 3-D: DeIDOT's role in project prioritization.



Figure 3-E: An integrated, multistage planning process filters priority projects from the local level to the State for state-level funding.



Timeline for Developing Plans and Submitting Projects



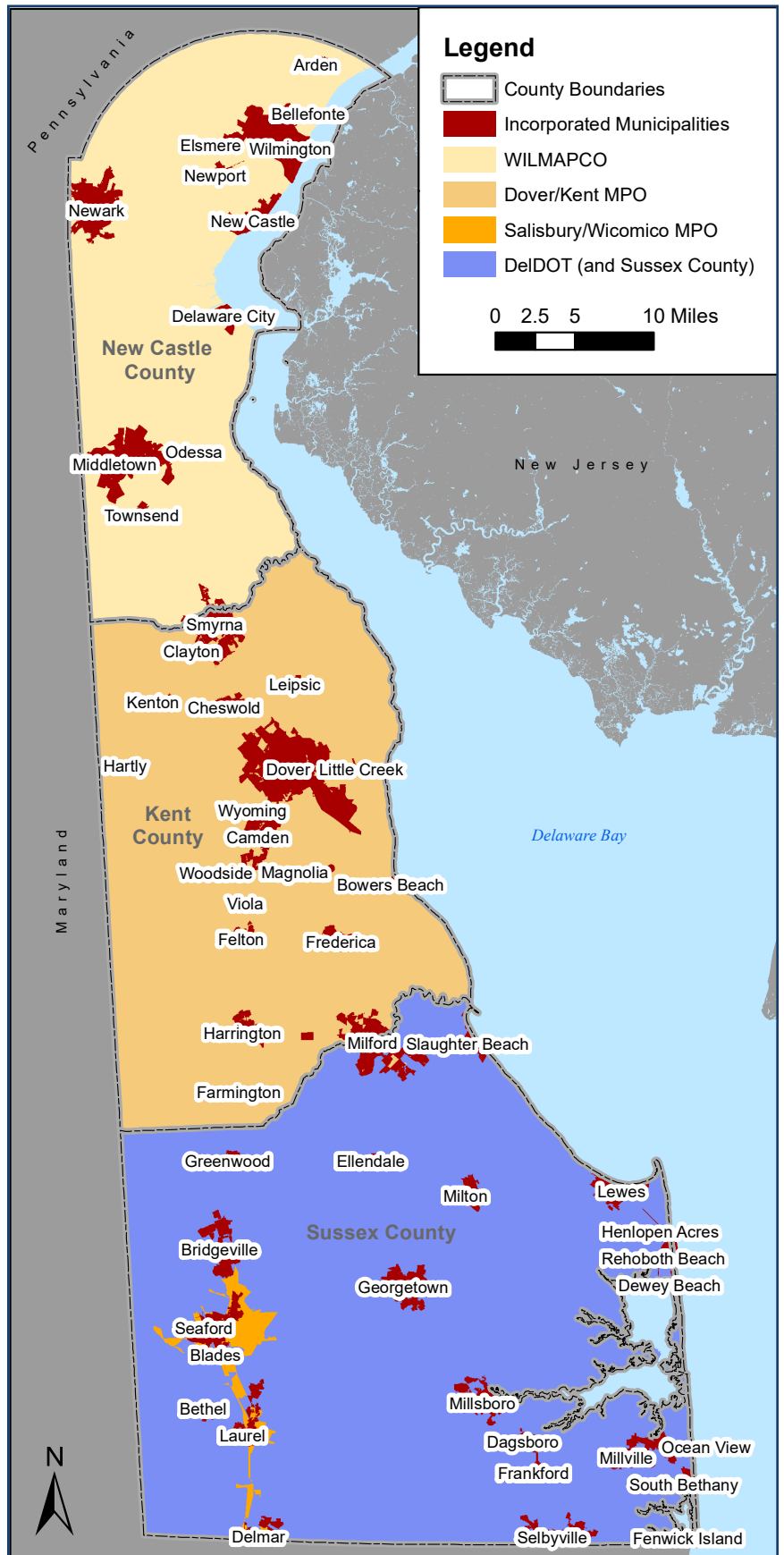
Timeline for Prioritization

	Month 1*			Sept./Oct.	Next Year's Cycle
Municipality	• Submit project priorities to MPO/County		• Respond to local commit request		
Regional Entity <small>*Regional entities may set their own timeline; DeIDOT will request a prioritized list from regional entities in Sept./Oct.</small>	• Collect local priorities	• Submit list to DeIDOT	• Confirm local commitment		• Request priorities from local government
DeIDOT		• Collect Regional Lists • GIS map • Feasibility analysis • Feasibility Screening		• Release list of funded projects • Update map	• Solicit next year's prioritized project lists

Regional Planning Jurisdiction

There are many different entities governing transportation and trail planning in Delaware, from local municipalities, to counties and Metropolitan Planning Organizations (MPOs), to DelDOT and the Department of Natural Resources and Environmental Control (DNREC). In Sussex County, where there is no MPO that covers the county in its entirety, DelDOT will work with the County to develop a bicycle plan and identify priority projects.

Figure 3-F: Map showing local, municipal, and regional jurisdiction in Delaware



Bicycle Infrastructure Funding in Delaware

There are several funding sources available for bicycle infrastructure in Delaware. The primary source is the Statewide Bicycle and Pedestrian Funding Program, which is described in detail in other sections of the *Blueprint for a Bicycle-Friendly Delaware Toolkit*. The following is a basic summary of the program:

- Submit local plan with priority projects to regional entity
- Regional entity prioritizes, confirms, and submits projects to DeIDOT for consideration
- DeIDOT prioritizes projects and releases list of selected projects

Timeline: DeIDOT's call for projects in Sept/Oct; regional entities establish their own timeline leading up to the DeIDOT timeline.

Funding requirements: No local match required

The following sections describe several other channels through which bicycle infrastructure projects can be implemented:

Transportation Alternatives Program

The Transportation Alternatives Program (TAP) is a set-aside of the federal Surface Transportation Block Grant (STBG) Program. TAP funds programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; Safe Routes to School projects; and projects for the planning, design or construction of boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.

Eligible local project sponsors include local governments, regional transportation authorities, transit agencies, natural resource or public land agencies, school districts or schools, and tribal governments.

Local project sponsors must provide a 20 percent match for these funds.

This program requires a formal application process.

Timeline/process:

- DeIDOT administers this program on a rolling basis, grouping and prioritizing applications by calendar year
- Projects located in Kent County and Sussex County go through the DeIDOT process
- Projects located in New Castle County go through the WILMAPCO project prioritization process, which follows a timeline established by WILMAPCO

More information:

- Outside of New Castle County: <https://www.deldot.gov/Programs/tap/index.shtml>
- New Castle County (WILMAPCO): <http://www.wilmapco.org/tap/>

Project examples:

- Elsmere Bicycle and Pedestrian Improvements
- North Street Sidewalk Improvements, Dover
- Lewes Canal Park

State Capital Transportation Program (for a project exclusively focused on bicycle/non-motorized infrastructure)

Occasionally, there is a need for a bicycle-focused project that exceeds the available funds through the standard programs described herein. These projects would be in the multi-million dollar range and address a significant need for infrastructure, but not be realistically fundable through other channels. An example is the New Castle Industrial Track Trail Phase III.

Funding through this channel comes through Federal and State Surface Transportation Funds and Safety Funds.

Timeline/Process:

- Follow's the State/MPO CTP process

More information: <https://www.deldot.gov/Publications/reports/CTP/index.shtml>

Outdoor Recreation, Parks, and Trails Program

The Outdoor Recreation, Parks and Trails (ORPT) Program [formerly known as the Delaware Land and Water Conservation Trust Fund (DTF)] provides funding for the acquisition of open space and the development of outdoor recreation projects. The ORPT Grant Program is administered by the Delaware Division of Parks and Recreation, Department of Natural Resources & Environmental Control and Trust-earned income is used to fund the Program.

County and municipal governments and park districts may request and receive ORPT grant assistance.

Eligible projects include trail projects within parks or public rights of way.

More information:

- Fact Sheet: <http://www.dnrec.delaware.gov/parks/Services/Documents/grants/ORPT%20Fact%20sheet.pdf>

Trail grant guidance:

- <http://www.dnrec.delaware.gov/parks/Services/Documents/grants/ORPT%20Guidance%20for%20Trail%20Projects.pdf>

Project examples:

- <http://www.dnrec.delaware.gov/parks/Services/Pages/Grants.aspx> (shows several example projects)
- Elsmere Bicycle and Pedestrian Improvements



Source: University of Delaware IPA

Delaware Bicycle Council Cycling Infrastructure Innovation Grant Program

The purpose of the Cycling Infrastructure Innovation Grant is to evaluate the feasibility of a bikeway project concept – pathways, protected bike lanes and bicycle streets – that will expand the number of everyday destinations that people of all ages and abilities can access on a bicycle.

The Delaware Bicycle Council (DBC) typically allocates \$20,000-\$25,000 a year, total, for one or more projects. The DBC sends out an announcement each year to municipalities and the three Counties to notify them about the opportunity to apply.

No match is required. This funding source cannot be used as a match for Federal DOT funding programs.

Timeline/Process:

- I. Call for projects (fall, annually)
- II. Project application submitted by local entity
- III. DBC reviews, ensuring project meets requirements of grant and has municipal letter of approval
- IV. Projects prioritized, field visits occur, projects selected

Project examples:

- Town of Bridgeville (Trail Design)
- Town of Smyrna (Trail Feasibility Study)

Local or Private Funding

Bicycle infrastructure may be constructed with municipal or county funding. Local funds are often used together with other funding sources for construction of bicycle facilities and may be used as match for Federal funds. Use of local and private funds does not factor into the prioritization of projects, but may help increase the number of projects reducing the share covered by Federal or State funding.

Example projects:

- Markell Trail (New Castle Industrial Track Trail), Phase II (funded/constructed by New Castle County)
- Union Street bike lane, City of Wilmington (partial funding by City of Wilmington)

Complete Streets Policy—Incorporating Bicycle Infrastructure as Opportunities Arise

Delaware’s Complete Streets Policy has been in place since 2010. The policy identifies the benefits of a multi-modal transportation system and aims to ensure that modifications to the transportation system are done in a way that enables safe and efficient access for all users, including bicycling. Policy objectives include “defining and implementing changes to the project development process that will value all transportation modes during the project scoping phase and enhance currently used design practices through updates to DeIDOT subdivision and design manuals, design memoranda, and policies.”

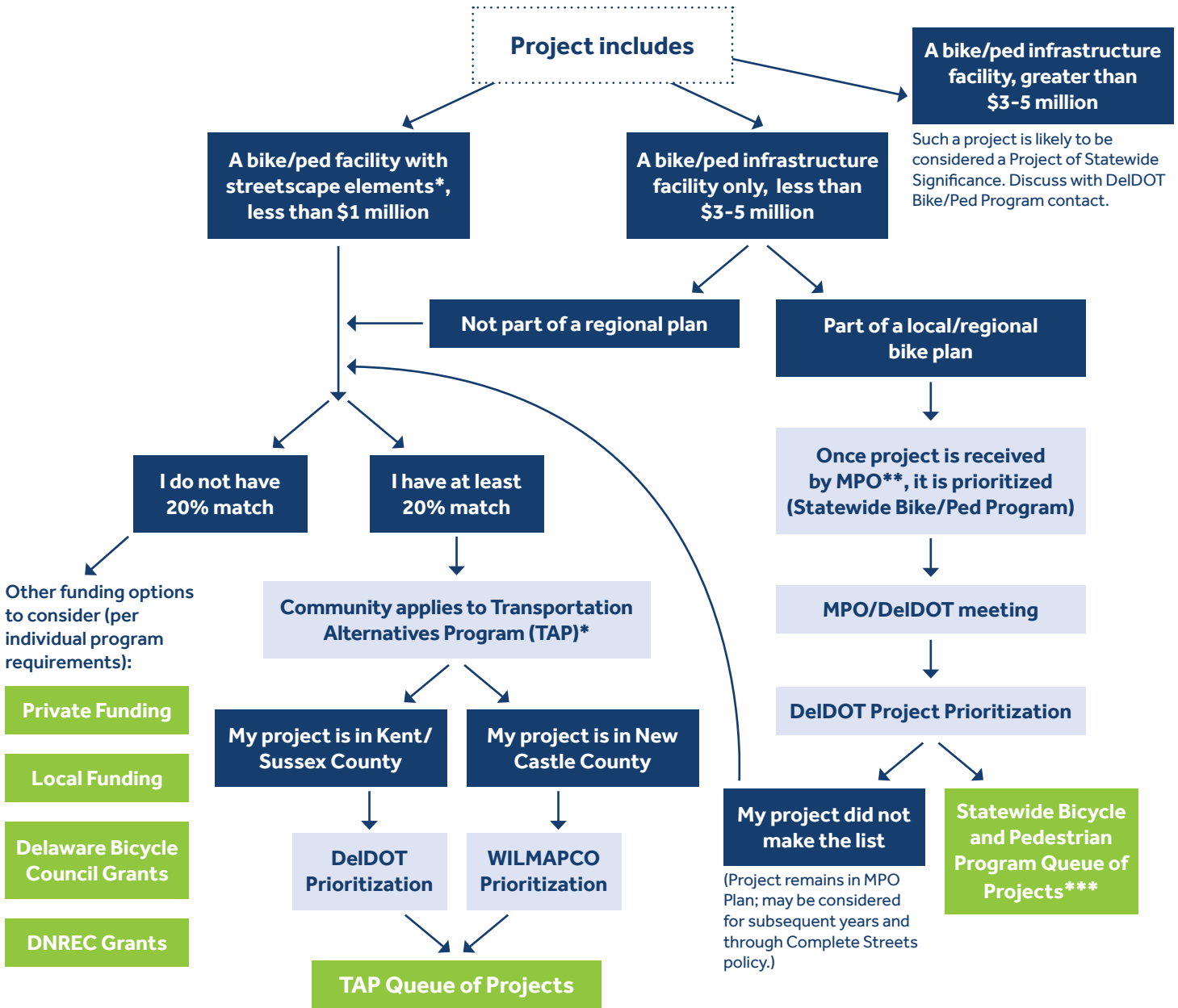
Based on anecdotal evidence, it is apparent that subsequent to the establishment of the policy, Delaware’s transportation system has become more accommodating of bicycling. A number of strategies for the *Blueprint* include establishing an implementation plan and processes to ensure that the facilities included through Complete Streets policies are most desirable and contribute toward the accomplishment of the *Blueprint* vision.

The locally-driven statewide bicycle network planning being developed through this *Blueprint* will serve as an important mechanism for helping planners and designers ensure that the bicycle components incorporated into capital and development projects are in line with the vision and recommendations for the *Blueprint*. Those professionals will have access to the comprehensive map and list of projects, so as they are developing project plans and designs for roadways throughout the state, they will have a readily available resource to quickly determine whether their project area coincides with any planned/desired bicycle facilities.



St. George's Bridge protected bike lane. Source: WILMAPCO

How Do Bicycle Projects Get Funded?



* See specific TAP requirements (streetscape elements not a requirement for TAP).

** If located in Sussex County, project submitted to DeIDOT.

*** Project agency leads—such as DeIDOT Planning, Division of Transportation Solutions (DOTS), or Maintenance and Operations (M&O)—are determined based on factors including the funding source and amount, staffing availability and expertise for the features of the project, and other projects in the pipeline that may lead to other partnerships and coordination efficiencies.

The importance of local bicycle network planning:

Local bicycle network plans are integrated into regional bike plans, which are the source of projects to be considered for the Statewide Bicycle and Pedestrian Program. Regional Plans for Delaware’s three counties are

integrated and serve as the Statewide Bike Network Master Plan.

The **Statewide Bike Network Master Plan** is referenced by...

- Division of Transportation Solutions (DeIDOT)

- DeIDOT Development Coordination
- Delaware State Parks

...and helps **guide planning and project development**, so those entities may **integrate local bike plans** in their work across the state.

Project Prioritization Process

Prioritization for Funding through the Statewide Bicycle and Pedestrian Program

The *Blueprint for a Bicycle-Friendly Delaware* lays out a process for planning bicycle networks⁸ wherein projects generated by local and regional plans filter up to the state to be compiled into a statewide bicycle network planning map and considered for funding in the Statewide Bicycle and Pedestrian Program. This document describes the process by which projects are prioritized for the funding in that program.

The intention of DeIDOT's prioritization process is to provide intuitive and predictable results based on a transparent process that supports local priorities, leads to implementable projects, and achieves the network and facilities-focused goal of the *Blueprint*.

The *Blueprint's* network goal emphasizes the development of complete, comfortable, and connected system of bicycle facilities. Therefore, the project selection process specifically prioritizes connectivity, comfort, and access to destinations. It does this by measuring the impact that a proposed project would make on the ability of a person to ride a bike to nearby destinations using only streets and trails characterized as comfortable for a wide range of users, rather than only the most skilled and/or determined riders.

This document spells out DeIDOT's prioritization process for local, regional, and statewide stakeholders. Knowing the criteria DeIDOT uses to select projects for funding – and the state's overall bicycle network goals discussed above – will help local governments plan local bike networks with a realistic sense of what types of projects are likely to get funded and help regional governments plan, coordinate, and prioritize projects. People planning local and regional facilities are encouraged to refer to the Level of Traffic Stress map and data provided by DeIDOT as part of this *Blueprint* to assess corridors and intersections that currently impede low-stress connectivity in their communities and consider planning trails and on-road facilities that safely and comfortably connect communities and destinations.

Network Goal: Develop a Complete, Comfortable, Connected Bicycle Network

- 1.1 Increase the number of homes and destinations connected entirely by the low-stress bicycle network.
- 1.2 Increase the amount of the bicycle network (streets and paths) that is safe and comfortable for all ages and abilities.
- 1.3 Improve maintenance of shoulders, trails, and on-street bicycle facilities.
- 1.4 Increase regional and long-distance travel possibilities for bicycles.
- 1.5 Increase funding options and strategic partnerships for network investment.

Overview of the Prioritization Process

The prioritization process is designed to support local priorities, select implementable projects, and create complete networks through the process documented in the Local Bicycle Network and Project Planning section of the *Blueprint* Toolkit.

Based on local planning priorities, WILMAPCO, the Dover/Kent MPO, and Sussex County will each submit three to five priority projects to DeIDOT. If a regional agency submits more projects, they will be asked to prioritize those projects into tiers. This ranking will be taken into account by DeIDOT.

The next step is to ensure that projects are implementable. To this end, DeIDOT conducts an initial feasibility screening for select projects and screens out projects that are infeasible due to right-of-way

⁸ See *Local Planning Process* for more information

acquisition, utilities, environmental considerations, and other issues that may lead to excessive expense or approval challenges. For more details on the first and second steps, see the Local Planning Process document.

This document focuses on the project scoring process to prioritize the projects that have been submitted to DeIDOT. The scoring process measures how much a proposed project improves low-stress access to destinations.

Scoring

What DeIDOT is Looking for in a Project

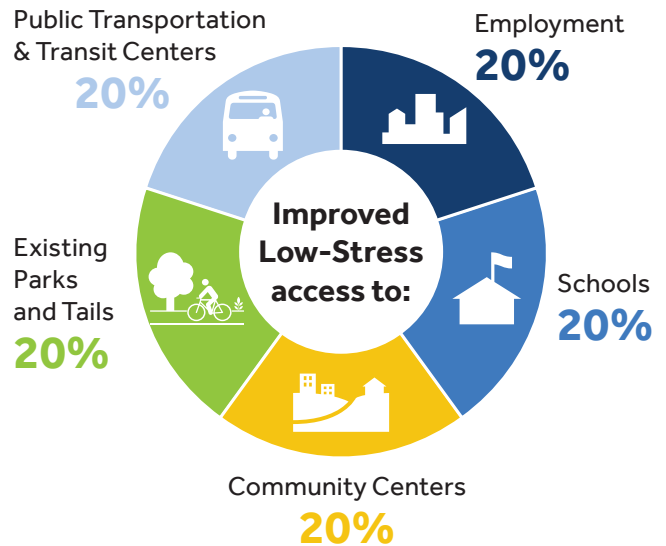
DeIDOT measures the impact of a project using a method known as Level of Traffic Stress (LTS) Analysis. It does this by assigning each project (or bundle of projects) a score based on the increase in the number of destinations that can be reached by a route that would be comfortable for a person who does not want to ride next to fast-moving traffic.

In short, a project will score well if it connects people to destinations, provides separation from traffic, and turns a stressful route into a comfortable one. There are many types of destinations. The score is based on access to employment, schools, trails and parks, community centers, and public transportation (see Figure 3-G). Community centers include many types of places, such as recreation centers, senior centers, town halls, post offices, police departments, and fire departments.

A project will score well if it:

1. Connects people to destinations,
2. Provides separation from traffic, and
3. Turns a stressful route into a comfortable one.

Figure 3-G. The categories of destinations used in project scoring for the Statewide Bicycle and Pedestrian Program



Michael Castle Trail along the Chesapeake and Delaware Canal in northern Delaware. Source: University of Delaware IPA

Level of Traffic Stress (LTS)

How Traffic Stress Is Measured

Level of Traffic Stress analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride (see Figures 3-H and 3-I). It analyzes the total connectivity of a network to evaluate how many destinations can be accessed using low-stress routes.

Additional tables addressing level of traffic stress across a variety of traffic facilities can be found in the Appendix starting on page 123.

“Traffic stress... is a combination of perceived danger and other stressors... associated with riding a bike close to motor traffic.”

- Northeastern University Professor Peter Furth, 2012.

Figure 3-H. Definition of Levels of Traffic Stress.





Level of Traffic Stress	Description	Example
1	Safe for children to use; Usually completely separated from auto traffic	 Photo by Bob Patten
2	Tolerated by most mainstream adult populations of cyclists; Roads with low volume and low speed auto traffic	
3	Tolerated by riders who are enthused and confident; Heavy traffic with separated bike facility	
4	Only tolerated by strong and fearless riders; cyclists must interact with high volumes or speeds of auto traffic.	

Figure 3-I. Characteristics (number of lanes, volumes of traffic, and speed of traffic) that impact bicycle comfort.

Number of Lanes	Average Daily Traffic	<25 mph	30 mph	35 mph	40 mph	45 mph	50+ mph
2-way street (no centerline)	0-750	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
	751-2000	LTS 1	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4
	2001-3000	LTS 1	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4
	3001+	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4
1 through lane per direction (1-way street or 2-way street with centerline)	0-750	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
	751-2000	LTS 1	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4
	2001-6000	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4
	6001+	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4
2 through lanes per direction	0-6000	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	6001+	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
3+ through lanes per direction	any ADT	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4

Scoring Example

The following figures show how a hypothetical set of example projects in Milton, DE would be scored. Figure 3-J shows the LTS analysis for the Town of Milton. The red lines in the eastern and western parts of town show high-stress routes, where most people would likely not feel comfortable riding. Orange lines indicate several major traffic routes that would also be stressful. Pockets of dark green show neighborhood streets that provide comfortable bicycling conditions.

Figure 3-K shows the routes a person in a residential neighborhood would need to take to access the closest

elementary school. Before the proposed project the person would have to travel 8,045 feet over high-stress roads to get to Milton Elementary School. Figure 3-L shows a proposed trail corridor. Figure 3-M shows the new shortest route from the home to the elementary school. Now it is shorter and entirely on low-stress segments. This project would score well (see Figure 3-Q) because it connects people to destinations, provides separation from traffic (the trail), provides a low-stress alternative to a high-stress route, and reduces distance traveled to the destination.

Figure 3-J. A Level of Traffic Stress analysis for the Town of Milton. Red lines show very stressful routes (LTS 4), yellow lines show stressful routes (LTS 3), and the green lines show more comfortable routes (LTS 1 and 2). Trails are shown in blue and are generally considered the lowest-stress facility.

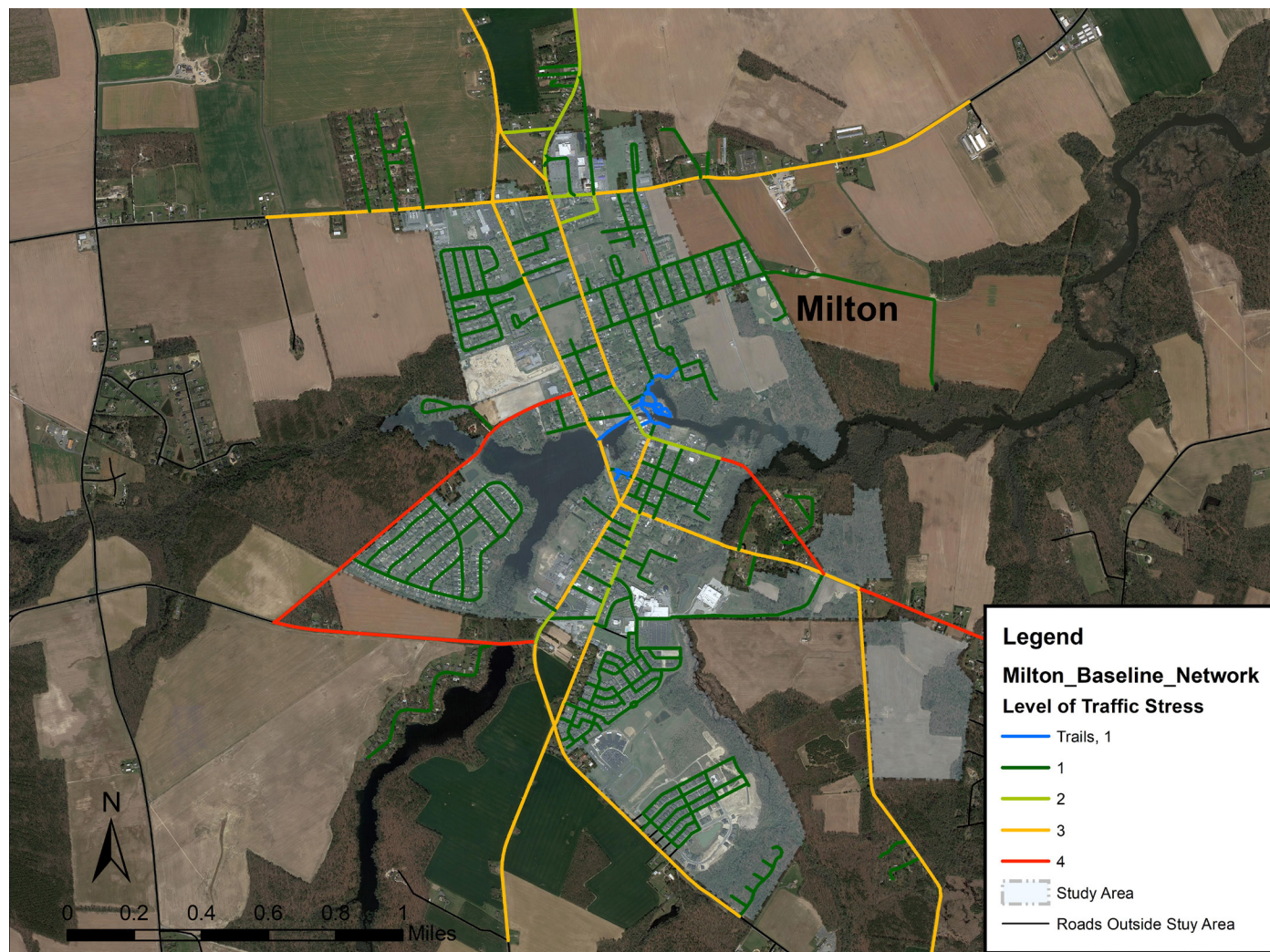


Figure K. A blue line indicates the current shortest route from a home in a development to the nearest elementary school. It requires traveling over roads with high speeds and volumes of traffic.

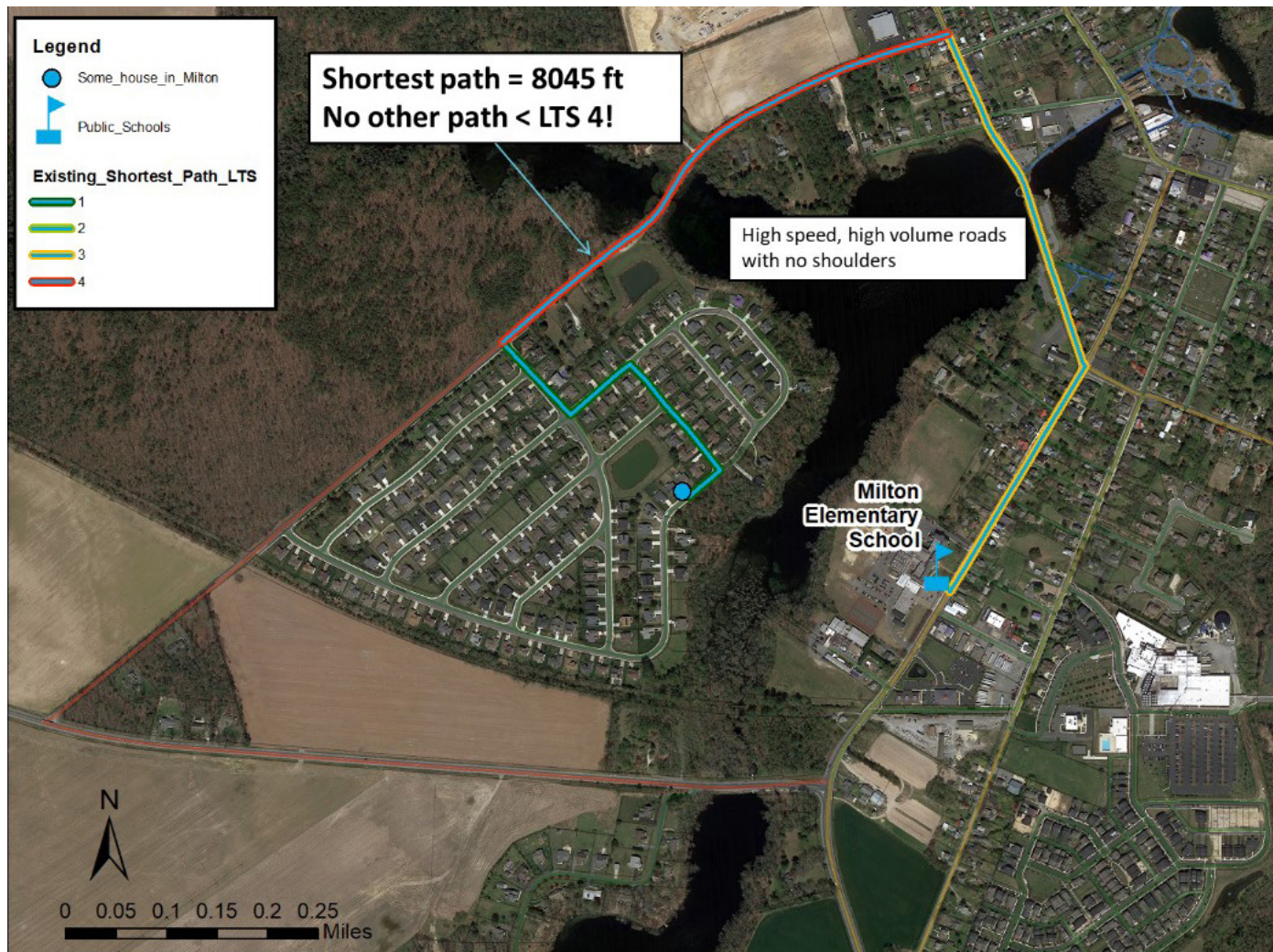
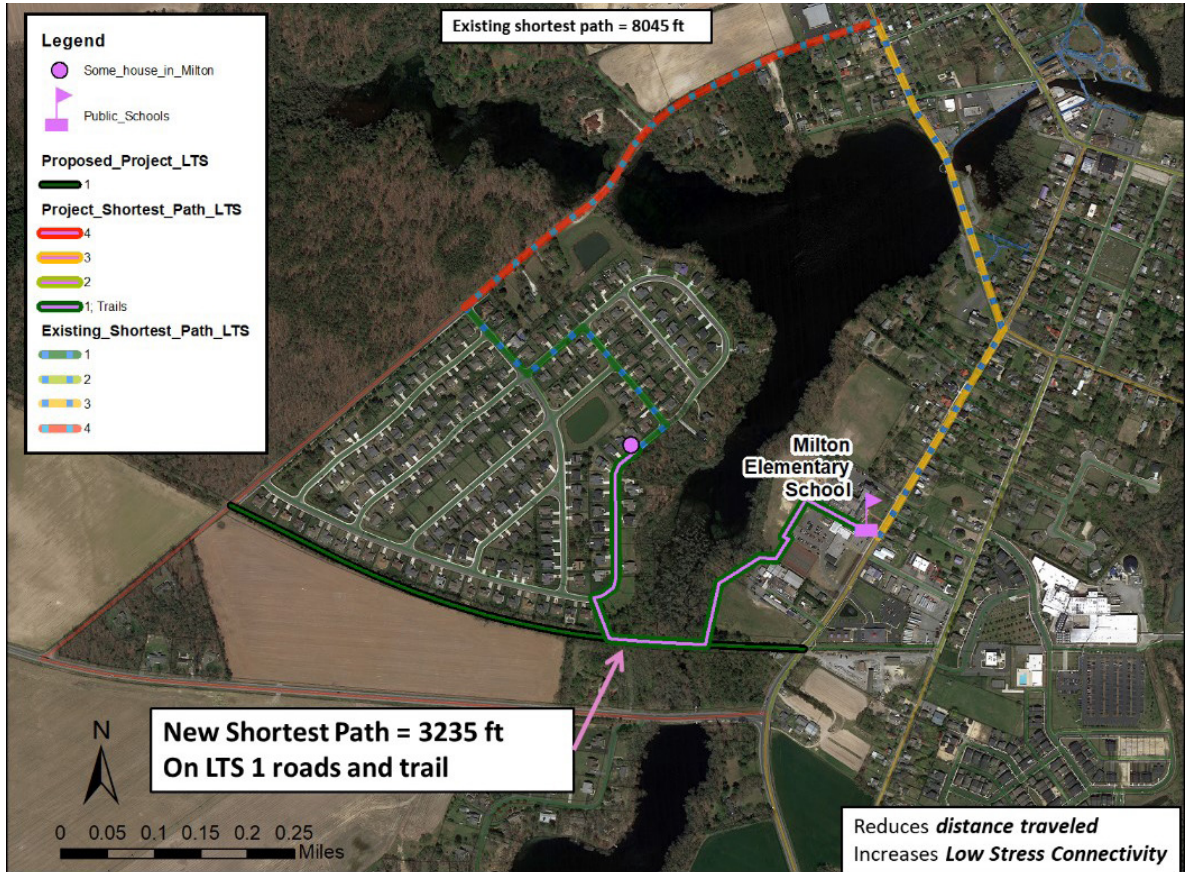


Figure 3-L.
A proposed trail connecting a residential community to Federal Street in Milton.



Figure 3-M.
A pink line shows the new shortest route to from the home to the school. The new route is shorter and travels only on low-stress segments.



Comparing Projects

Now that we have seen how one project scores, we can look at how it would compare to others. Figure 3-N shows pockets, or islands, of low-stress streets, effectively disconnected sub-networks. Figure 3-P shows four hypothetical projects that would help connect those pockets. The four projects are the rail trail shown above, a connector path, a bike lane, and an advisory shoulder. Each of these projects provides different amounts of separation from traffic: the trail and connector path provide more separation, the bike lane provides some separation, and the advisory lanes provides the least separation. They also provide varying amounts of access to destinations in Milton (Figure 3-O). Figure 3-Q shows how the four projects would score based on these factors.

Bundling Projects

The goal of the Statewide Bicycle and Pedestrian Program and the *Blueprint* is to create connected networks. As the example above shows, this often requires a combination of projects. Regional agencies—WILMAPCO, the Dover/Kent MPO, and Sussex County (with DelDOT)—are invited to submit bundles of projects. These bundles will be treated as one project from the feasibility screening through the scoring.

Figure 3-N. The colored grids show separate “islands” of connectivity that are cut off from one another by busy roads shown in black.

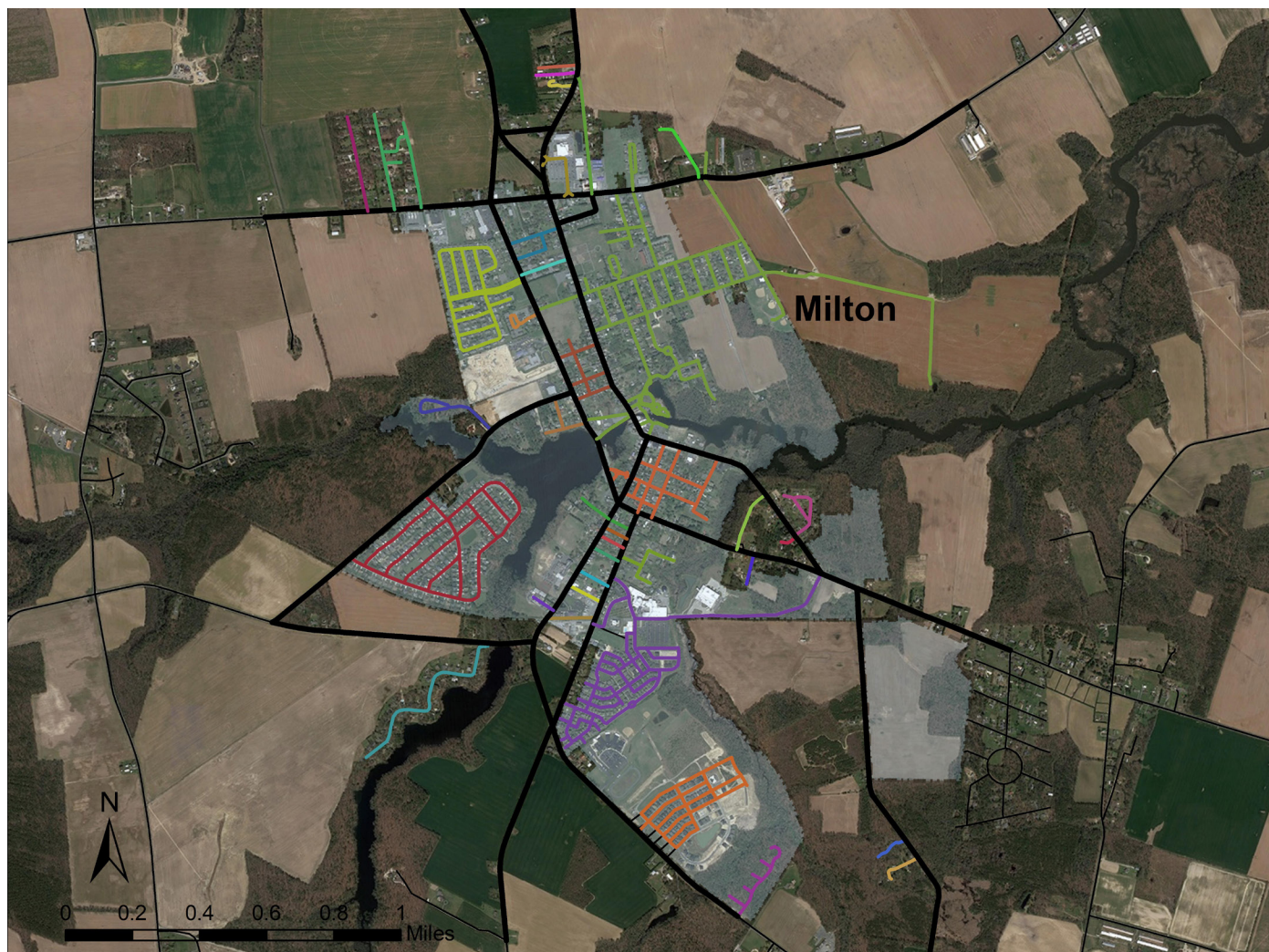


Figure 3-O. Milton's parks, schools, bus stops, community centers, and employment areas.

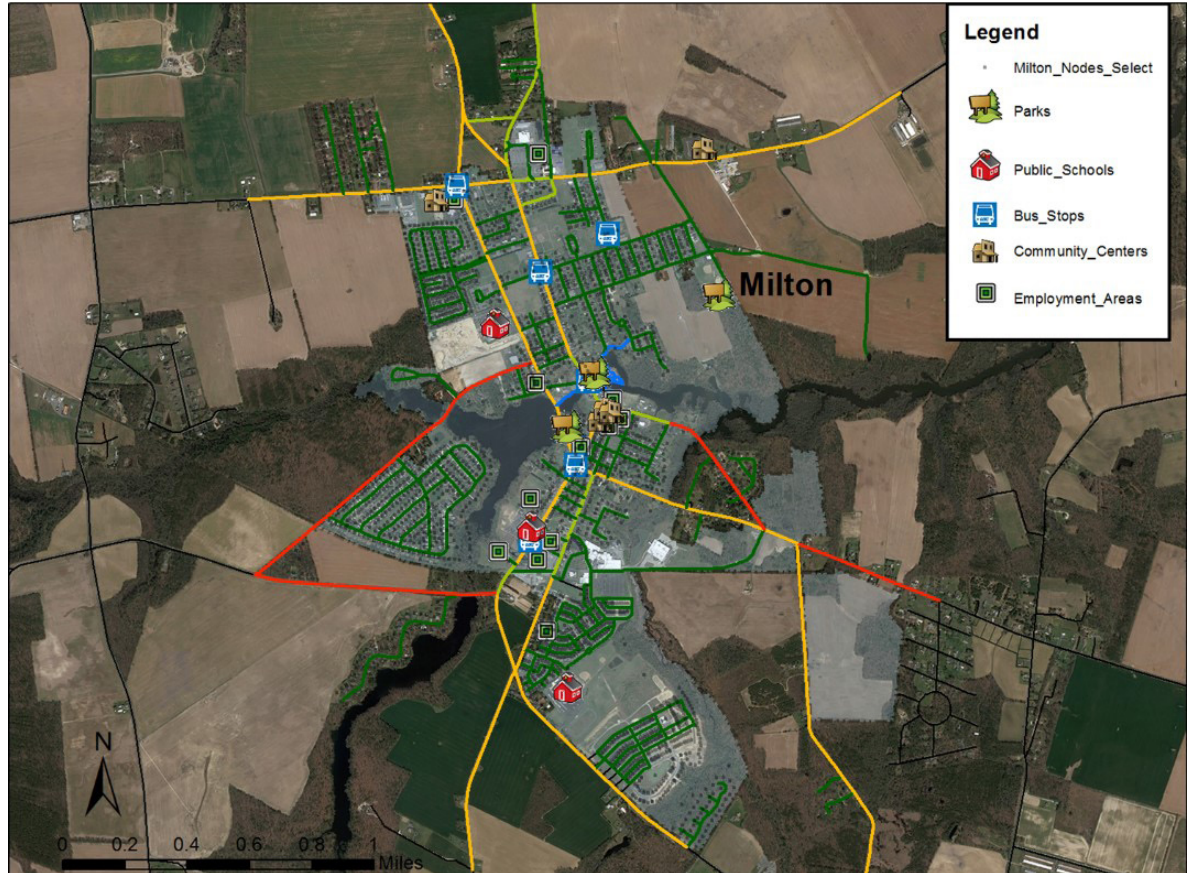


Figure 3-P. Four hypothetical projects – the rail trail, a connector path, a bike lane, and advisory shoulder – would help connect the disconnected islands.

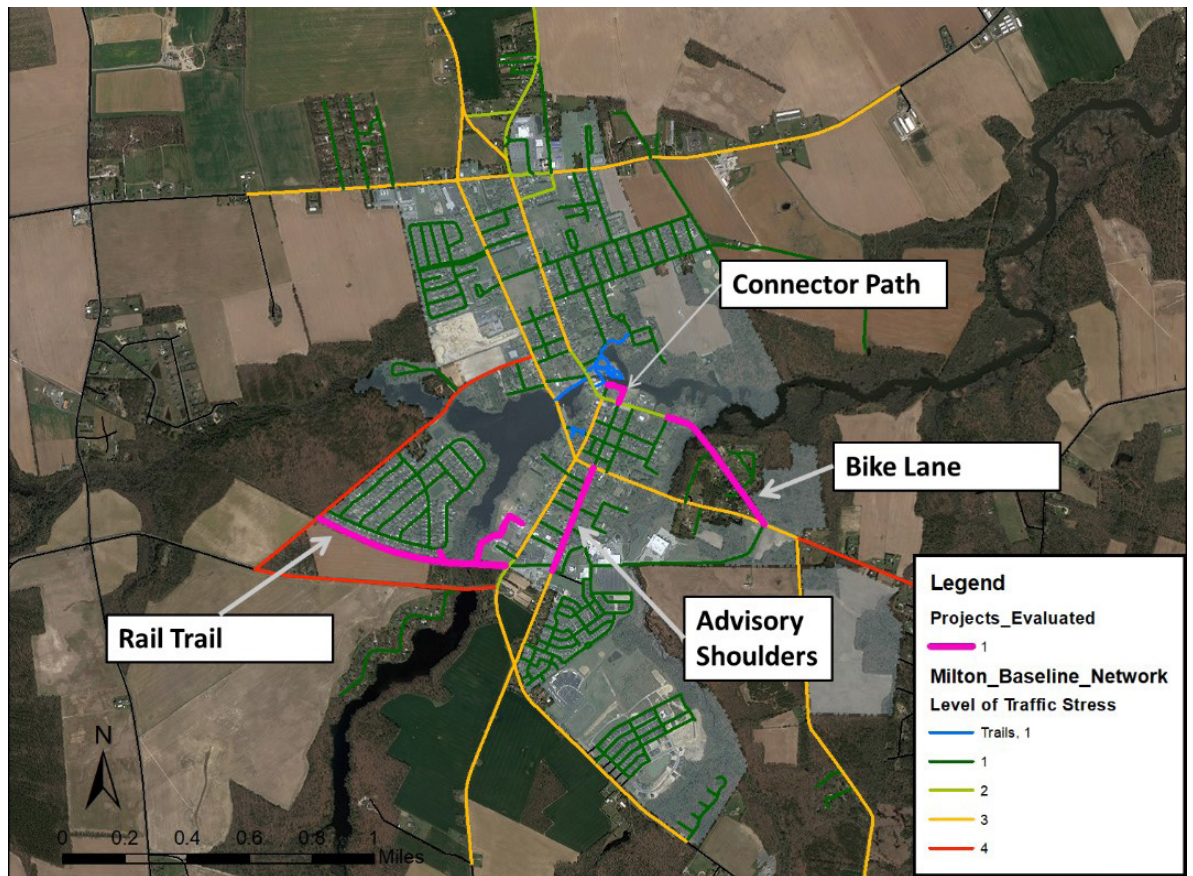
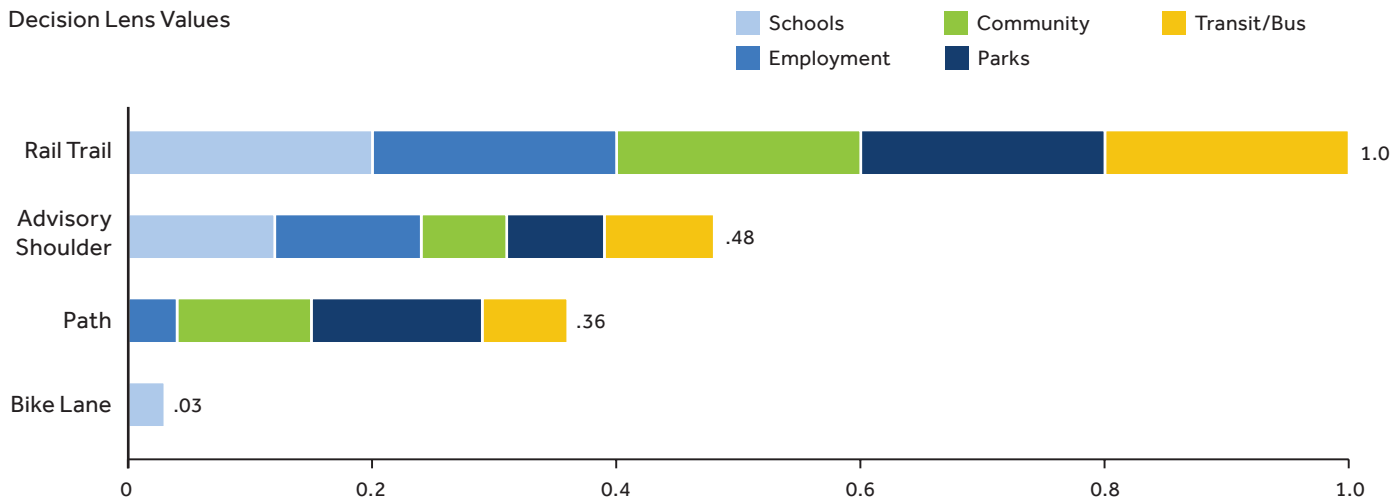


Figure 3-Q. This chart shows the relative improvement of the four hypothetical projects based on how much they would improve connectivity and comfort. The rail trail scores the best and the bike lane, located in a less populated part of town providing access to fewer destinations, shows the least impact.



Conclusion

This prioritization process was developed to support the creation of connected, low-stress networks in Delaware. This document describes the process in accordance with the *Blueprint* goal of establishing a transparent system.



Integrated Land Use and Transportation Approach

The *Blueprint for a Bicycle-Friendly Delaware* emphasizes development of a complete, comfortable, connected network. Objective 1.1 states: “Increase the number of homes and destinations connected entirely by the low-stress bicycle network.”

A critical component of achieving better connectivity of destinations is to address development and land use patterns, in addition to the transportation system. This resource offers ideas for how such a strategy could be achieved.

In Delaware, over 90% of the transportation system is managed by the Delaware Department of Transportation (DelDOT). Land use is managed by local governments—towns, cities, or counties. Because land use and transportation are managed by separate bodies, coordination is more difficult and there are times when land use and development decisions are at odds with transportation decisions. This is a significant hurdle to achieving community goals. For communities that would like to make it easier and safer to bike (and walk and take transit) this disconnect can mean that while great effort is put forth to realize a development where one’s home,

work, and other daily activities are within a short walk or bike ride, the adjacent transportation system is designed predominantly for motor vehicles to the extent that those interested in bicycling/walking opt not to because it’s not comfortable or safe. The reverse can also be true.

In addition to existing policies and processes that are intended to address this perennial challenge, this document presents additional actions that may be taken to make further progress toward integrating land use and transportation for achieving a bicycle-friendly (and walking and transit-friendly) Delaware.

PARTNERS	ROLES
DELDOT	<ul style="list-style-type: none"> • Ensure that policies, plans, and designs are concurrent with local land use plans and community goals • Include local land use planning staff in project scoping and development
OFFICE OF STATE PLANNING COORDINATION	<ul style="list-style-type: none"> • Encourage inclusion of policies and strategies that foster integrated land use and transportation planning and development in local plans (comprehensive plans, corridor plans, etc.)
METROPOLITAN PLANNING ORGANIZATIONS	<ul style="list-style-type: none"> • Support local corridor and small area planning that fosters coordination between DelDOT, land use agencies, and local communities
COUNTIES / MUNICIPALITIES	<ul style="list-style-type: none"> • Create/update comprehensive plans to include transportation content and actions that foster integrated land use and transportation strategies • Prepare master, small area, and corridor plans and integrate them into comprehensive plans • Educate decision-makers regarding community visions, goals, and plans • Engage with DelDOT on transportation projects

Bicycle & Pedestrian Priority Area (BPPA)

This multi-phased strategy would begin with local communities working with DeIDOT and the local government to identify areas where there is need to address safety and comfort of non-motorized travelers and desire to be a pedestrian/bicycle/transit-oriented place in the future.

Early actions will focus on corridor safety improvements, such as transit stop placement, signal spacing, and added crossings, particularly in crash clusters or areas identified in safety studies. Important policy changes, would also be initiated to prepare for later phase actions.

Intermediate actions will be moderately complex or resource intensive and be oriented toward achieving substantial physical change beyond the public right-of-way. Examples include adjusting parking requirements, modifying performance standards/targets to be in better balance with non-motorized modes, reducing roadway access conflict through consolidation, and implementing safety measures at access driveways, such as painted crossings or speed tables.

Later actions would be those that are more implementable once a critical mass of demand has been reached. Later actions would include public and private sector investment toward bicycle/pedestrian/transit-oriented development, such as major streetscape redesign and private redevelopment.

Designation of BPPAs should include eligibility for additional resources. These areas could also be prioritized for implementation of other *Blueprint* recommendations, such as enforcement, education, and encouragement.

Resources:

Delaware's Complete Communities Enterprise District (CCED) policy: <http://delcode.delaware.gov/title2/c021/index.shtml>

Maryland's Bicycle Pedestrian Priority Areas <http://sha.md.gov/Index.aspx?PagelD=693>

Delaware's Transportation Improvement District policy <http://www.ipa.udel.edu/publications/TID-Guide-2015-Final-Web.pdf>

Delaware Strategies for State Policies and Spending: <http://stateplanning.delaware.gov/strategies/>

Delaware's Downtown Development Districts Program: <http://stateplanning.delaware.gov/ddd/>

BPPA Benefits Beyond Bicycling and Walking

- » more predictable, efficient development process
- » economic development
- » community infrastructure that better serves the needs of all members of the public, whether bicyclists or not

Coordination and Concurrency

As DeIDOT and local land use entities take action toward realizing transportation corridors/infrastructure and developments that support bicycling (and walking and transit), it is important to ensure plans, policies, standards, and processes in each agency are concurrent with the others. In addition to existing mechanisms for this purpose, such as the Preliminary Land Use Service process, the following actions are advisable:

- Ensure DeIDOT policies and design manuals are concurrent with the policies and aims of local community plans. Consider enabling more flexibility in specially designated areas, such as BPPAs or CCEDs.
- Include land use and transportation staff in critical steps in decision making in transportation projects and land use/development projects. Evaluate processes and update procedures/protocol to foster more meaningful engagement.
- Increase staff expertise/experience with both land use and transportation disciplines.
- Increase sharing and use of land use and transportation data (e.g. bicycle level of traffic stress network connectivity and other measures of accessibility) to enable better measurement and evaluation.

Resources:

PennDOT Connects: <http://www.penndot.gov/Pages/all-news-details.aspx?newsid=297>

Additional Resources

These resources are intended to help local, regional, and state agency staff, non-profit staff, and interested community members find information about bicycling in Delaware. This section lists key organizations, events, laws, planning resources, design guidance and other tools that may be used to continue to make Delaware a bicycle-friendly state.

1. Community based bicycle organizations:

- **[Bike Delaware](#)**: An advocacy group that works in partnership with government agencies and local business and community groups to ensure a continuous biking and walking network for everyone.
- **[Delaware Greenways](#)**: An advocacy and planning group that rallies officials to develop outdoor trails and byways and ensure their maintenance to promote a culture of active and healthy living.
- **[Urban Bike Project of Wilmington](#)**: Supports communities by providing the means for the public to become self-sufficient both in bicycle transportation and maintenance. It does so through a low-cost bicycle shop, educational programs and community partnerships.
- **[Newark Bike Project](#)**: Creates an inclusive and flexible resource devoted to empowering members of the community in the use of bicycles. It offers affordable options for the community through reused/ recycled bicycles and parts and classes to help use and maintain bicycles.
- **[Trail Spinners](#)**: A chapter club of the International Mountain Bicycling Association, this group focuses on offering opportunities for enjoying and promoting the sport of mountain biking through trail rides and advocacy. In addition, this group is active in trail maintenance and race sponsorships.
- **[White Clay Bicycle Club](#)**: This club offers a variety of cycling experiences for all groups interested regardless of age, abilities or preferred facility. It offers frequent rides, classes and discounts at local bike stores.
- **[Sussex Cyclists](#)**: This cycling group offers bicycle rides in the Lower Delaware region.
- **[Bicycling Blue Hens](#)**: A non-profit bicycle club that works on encouraging and supporting bicycling. It organizes a series of rides for members of different ages and skills. The club's major event is the annual participation in RAGBRAI.
- **[Team DRT/ Deep Blue](#)**: A bicycle club that works on encouraging beginners, juniors and women to join the cycling sport.
- **[Ascent Velo](#)**: A competitive cycling team.
- **[1st State Bikes](#)**: A bike advocacy group in the greater Newark area.
- **Local Advisory Groups**
 - » **[Delaware Bicycle Council](#)**: Appointed by the governor, members of this council include representatives of the key agencies like DeIDOT, Council on Transportation, Department of Education etc. It works with the public sector agencies on developing policies and providing bike facilities.
 - » **[Bike Wilmington](#)**: Also known as the Wilmington Bicycle Committee (WBAC), this is an advisory group that advises and coordinates bike-related initiatives in the city. It enjoys strong participation from citizens and the support of public agencies.
 - » **[Lewes Bicycle and Pedestrian Advisory Committee](#)**: This committee is appointed by the mayor and city council. It works towards ensuring that the Lewes Bicycle and Pedestrian Plan is adopted and approved by the council and they receive concerns and suggestions about bicycle and pedestrian transportation in the city.
 - » **[Bike Newark](#)**: Previously known as Newark Bicycle Committee. This committee is a partnership between interested cyclists and organizations working to improve bicycling in Newark. It promotes a biking and walking culture and expand safe and connected bike and walk infrastructure.
 - » **[Bicycle Pedestrian Subcommittee of Dover](#)**: This committee is tasked with identifying gaps in the bicycle and pedestrian network in Dover and identifying potential areas for bicycle and pedestrian projects. They do so via monthly public meetings.

2. Department of Motor Vehicles bicycling

resources: This page provides a list of the cyclists' rights and cycling related traffic laws that cyclists and drivers should follow.

3. Delaware Bicycle Laws: This is the subchapter on bicycles and other human-powered vehicles in the State of Delaware Rules of The Road. Below are the major roads that affect bicycles as listed by The League of American Bicyclists in the State Bike Laws [page](#).

- **3-foot passing law:** A driver of a motor vehicle shall ensure the safety of a bicyclist they are approaching by reducing speed, providing a minimum of 3 feet of clearance and making a lane change if possible.
- **SB 120:** Right turn lanes may be used by cyclists to continue straight through intersections.
- **Vulnerable users law:** Delaware recognizes bicyclists among vulnerable users that require protection. The state enforces additional penalties on any person found guilty of careless driving that seriously affects a vulnerable user.
- **Yield as stop:** a [law](#), currently in trial period. It permits bicyclists to yield at stop signs when the coast is clear, instead of requiring a complete stop at all stop signs with no exceptions.
- **Sidewalk Riding:** Delaware allows bicyclists to operate on sidewalks unless otherwise specified, or when a usable bicycle lane is available.
- **Helmet Law:** Delaware requires that any person under the age of 18 must wear a protective bicycle helmet.
- **Mandatory use of separate facilities:** Delaware does not require that bicyclists use any lane or path other than a normal vehicular traffic lane.

4. Education Initiatives and Programs

- **Youth bike safety education programs:**
 - » [Nemours](#), [Christiana Care](#), [Safe Kids](#), and the [University of Delaware Cooperative Extension](#). These programs work on teaching bike safety to kids and provide resources for parents on safety tips and practices.
- **Delaware/DelDOT bicycle safety checkpoints:** These are checkpoints periodically organized by DelDOT to

ensure the safety of bicyclists on roads. They offer free safety check for bicycles, install lights and give helmets for riders. (A list of dates is established early each calendar year and published on the DelDOT website.)

- **International Student Program:** This outreach program provides international students with information on bicycling in the Rehoboth Beach, Lewes, and Dewey Beach area to help them with their bicycling needs.

5. Encouragement Initiatives

- **Mapping and local riding information:**
 - » **DelDOT's bicycle route [map](#):** this basic interactive online resource shows routes throughout the state using the google mapping platform.
 - » **DelDOT's [bikeatthebeach.com](#):** an interactive map and print maps of the resort area.
 - » **[Playoutside App](#):** this web application shows the location of all recreational facilities in the state, including bicycle trails, park restrooms, and other points of interest to bicyclists. The app went public in early 2017 and is maintained by the Delaware Division of Parks and Recreation.
 - » **Local riding and mapping:** web-based and hard-copy information, including maps and route information, is prepared and published by some local and community organizations. Examples include the Lewes Bicycle and Pedestrian Committee, Delaware Greenways, and White Clay Bicycle Club.
 - » **[Safe Routes to School Program](#):** This Federal program is administered by DelDOT as an effort to make walking and bicycling to elementary and middle schools safer and more popular. Schools may apply for funding for small projects that address the following: engineering, education, enforcement, encouragement, evaluation. Some of the program funds are used within DelDOT for training and materials related to the administration of the program.
- **Transportation Alternatives Program (TAP):** This is a community-driven funding program that facilitates the development of non-traditional transportation projects with the goal of providing choices for non-motorized users that are safe, reliable and convenient.

It encompasses projects like pedestrian and bicycle facilities, recreational trails, and safe routes to school projects

- **Events:**

- » [Walkable, Bikeable Delaware Summit](#): This is an annual event organized by Bike Delaware.
- » **Legislators ride**: This is an annual bike ride with Delaware legislators.
- » [Wilmington Grand Prix](#): This is an annual criterium-style bike race.
- » **Bike to work day**: This is an event that takes place in several locations on one or multiple days throughout the year.
- » **Health promotion events**: the Delaware Division of Public Health, Nemours Health and Prevention, and other health oriented organizations regularly hold events to promote healthy living and physical activity, which includes bicycling.

- **Bicycle tourism promotion**: bicycling as an attraction for tourism runs statewide, from the popular mountain bicycle trails in the northern part of the state, to the beachside riding along the Atlantic in southern Delaware. Examples of promotion include:

- » www.visitsoutherndelaware.com/outdoor-recreation/outdoor-adventures/cycling
- » www.leweschamber.com/trails/junction-breakwater-biking-and-hiking-trail

6. Delaware Complete Community Planning

Toolbox: The Toolbox is an online website that provides resources for community leaders and local government officials to plan for “attractive, inclusive, efficient, healthy & resilient places.” Planning tools align with Delaware’s Strategies for State Policies and Spending, and are organized around the five elements of a complete community:

- [Complete Streets](#)
 - » [Low-Stress Bikeability](#)
- [Efficient Land Use](#)
- [Health and Livable](#)
- [Inclusive and Active Communities](#)
- [Sustainability and Resilience](#)

In addition, community-design tools, public-engagement strategies, and visual tools provide useful resources to download or view.

- **Equity:**

- » [Health and Equity Analysis of City of Dover and Kent County Regional Bicycle and Pedestrian Plans](#): This paper presents an equity analysis of the regional bicycle and pedestrian plans and suggests a series of strategies and improvements to promote equity and support active transportation for residents to access community assets, like schools, libraries, parks, and food retail.
- » [Pursuing Equity in Pedestrian and Bicycle Planning, FHWA, April 2016](#): This paper defines the concept of equity in transportation and shares strategies, practices and resources to address bicycle and pedestrian planning inequities.

7. National Bicycle Resources:

- [Bicycle Network Analysis](#): A tool by People for Bikes that helps communities measure the quality of their low-stress bike network.
- [Bicycle Friendly Community Resources](#): Bicycle Friendly America is a program of the League of American Bicyclists that provides guidance for communities and local governments on reaching bikeable communities.

8. Planning Documents Related to Bicycling in Delaware

- **Delaware Bicycle and Pedestrian Count Program Report (2016)**: documentation of DelDOT’s bicycle and pedestrian count program, which was concurrently initiated as part of the project to develop the program report and guide.
- **Delaware Bicycle and Pedestrian Count Program Guide (2016)**: summary of DelDOT’s bicycle and pedestrian count program and detailed description of methods for collecting, managing, and reporting data. This guide is intended for staff of DelDOT and any others who are collecting or coordinating count data with DelDOT.
- [Bicycle Facility Master Plan \(2005\)](#): A statewide network-oriented bicycle plan.

- [Delaware Rail-to-Trail / Rail-with-Trail System Master Plan \(June 2006\)](#): this plan reviews 11 selected railroad corridors to identify abandoned, inactive, and publicly owned active rail corridor segments that are potentially suitable for re-use as shared use off-road rail-to-trail and/or rail-with-trail facilities.
- **Regional (long range) transportation plan (RTP):** This document sets goals and strategies for transportation, including a specific list of projects, and are updated every four years. RTPs exist for the WILMAPCO planning area (New Castle County) and the Dover-Kent County MPO.
 - » [RTP \(WILMAPCO\)](#)
 - » [RTP \(Dover-Kent County MPO\)](#)
- **County/municipal bicycle plans:** locally developed plans tend to reflect greater details, in terms of local community input, local knowledge and data, and local routes and connections.
 - » [Wilmington Bicycle Plan/Bike Wilmington Working Group](#) (2008, being updated in 2018)
 - » [Newark Bicycle Plan, Newark Bicycle Committee](#) (2014)
 - » [Dover Bicycle Plan, Dover Bicycle Committee](#) (2015)
 - » [Rehoboth Beach Bicycle Plan](#) (2013)
 - » [Lewes Comprehensive Bicycle and Pedestrian Plan](#) (July 2010 update)
 - » [City of Milford Bicycle and Pedestrian Master Plan](#)
 - » [Georgetown, Millsboro, Bridgeville, etc.](#) (as developed by DelDOT)
 - » [Kent County Bicycle Plan](#) (in progress)
 - » [Sussex County Long Range Transportation Plan](#)
- **Corridor studies and master plans:** these plans focus on a specific corridor or area and tend to reflect greater detail, in terms of local community input, local knowledge and data, and local routes and connections.
 - » [Byway studies/plans](#)
 - » [Route 9 Corridor Master Plan](#)
 - » [Route 10 Bicycle and Pedestrian Study](#) (Dover)
 - » [North Claymont Area Master Plan](#)
 - » [Route 40 Corridor 20-Year Transportation Plan](#) (not completed)
 - » [Division Street: Capital Gateway Plan](#)
- **State Comprehensive Outdoor Recreation Plan / Outdoor Recreation Inventory (2013 update):** identifies bicycling as a needed outdoor recreational facility in all regions of the state and provides strategies and guidance for where and how to expand trails and pathway facilities.
- **State parks master plans:** These plans are critical documents that guide the Division of Parks and Recreation's investments. Trail facilities in Delaware's state parks vary from single track, packed earth facilities oriented toward mountain bicycling, to multi-use, asphalt trails that serve bicycle commuters as well as recreational users.
- **Local parks master plans:** county and local parks may contain trails that serve bicyclists. Though many would be oriented toward recreational cycling, trails in parks can also provide travel oriented connections for cyclists.
- **Comprehensive (land use) plans:** such plans for counties or municipalities in the state must be updated once every 10 years and set a vision, goals, principles, and objectives for land use and related development. Inclusion of bicycling in a plan's vision, goals, or other language can help build the case among the community and implementing entities (including elected officials and planning boards) for more bicycle-friendly development, including recreational and transportation environments. Examples of comprehensive plans that articulate bicycling include:
 - » [City of Milford](#) is currently updating its comprehensive plan
 - » [City of Newark](#)
 - » [City of Lewes](#)
 - » [Sussex County](#) is currently undergoing an update of its comprehensive plan
 - » [New Castle County](#) also anticipates an update of its comprehensive plan in the near future

9. Bicycle-related Policies in Delaware

- **Strategies for State Policies and Spending / Livable Delaware:** this policy broadly requires state agencies to adopt policies and practices that prevent sprawl and result in efficient use of land and resources.

- **Delaware Long Range Transportation Plan (LRTP)** (2010 is most recent, 2016/2017 forthcoming): provides a 20-year view of the principles, policies, actions and performance measures that will shape future transportation investments in the state.
- **Title 17, Chapter 10 (Delaware Code), Bikeways and Safe Routes to School:** this section of the Delaware Code broadly assigns DelDOT authority to establish bikeways in the state. The policy directs that the Department shall conduct near- and long-term planning for development of bikeways in the state and enables actions necessary for establishing bikeways.
- **DelDOT “Bicycle Policy” (Effective December 2000):** Referring to authorization in the [Delaware Code](#), this policy is an internal document (P.I. Number D-06) that serves as a directive for inclusion and design of bicycle facilities by DelDOT.
- **Complete Streets Policy (January 2010):** Delaware’s Complete Streets Policy identifies the benefits of a multi-modal transportation system. The purpose of the policy is to ensure that modifications to the transportation system are done in a way that enables safe and efficient access for all users, including walking, bicycling, and riding transit.
 - » Related resource: [Complete Streets in Delaware: A Guide for Local Governments](#)
- **Complete Community Enterprise District [Senate Bill \(SB\) 130 \(2016\)](#):** a state policy that provides land use and transportation development incentives to local governments. The policy is intended to result in more compact, mixed-use, transit- and bicycle-friendly development patterns as compared to the sprawling development patterns typically found around the state.
- **[Walkable, Bikeable Delaware Resolution \(April 2011\)](#):** update to Strategies for State Policies and Spending—identified “linking cities and towns by a network of off-alignment multi-use paths that can be used by commuters in addition to recreational pedestrians and bicyclists” as one of the State’s transportation spending priorities.
- **[First State Trails and Pathways Plan](#):** a product of the Walkable, Bikeable Delaware Resolution. DelDOT and DNREC established a Memorandum of Agreement in late 2011 to collaboratively develop a statewide plan outlining a bicycle and pedestrian network of off-road facilities serving transportation and recreational purposes.
- **Context Sensitive Solutions for Delaware Byways:** this document provides a framework to understand byways, to ensure appropriate design solutions are proposed by guiding planning, design, and construction on Delaware Byways. As of 2017, there are six byways in the state. The document contains a separate section for bicycle facilities and what factors and tradeoffs to consider when designing with bicycle facilities on a Byway.
- **[Transportation Improvement District \(TID\) \(in the \[Development Coordination Manual\]\(#\)\)](#):** this policy establishes a funding mechanism based on a proactive, comprehensive approach to finance the construction, maintenance, and expansion of a transportation within an established geographic area.
- **Strategic Highway Safety Plan (2015 Update):** this document sets strategic direction for safety improvement based on crash data and, thereby, influences project prioritization through the project prioritization criteria related to safety (see “project prioritization” section, below).

10. Bicycle and Road Design Guidance

- **[Road Design Manual](#):** this document provides guidance for all DelDOT design projects. Bicycling is mentioned briefly in sections on design standards and design controls. “Suitable bike accommodations are determined as part of DelDOT’s Project Development Process and scoped prior to design initiation.”
- **[Development Coordination Manual](#):** The purpose of DelDOT’s Development Coordination Manual is to set forth DelDOT’s requirements for planning, design, construction, and acceptance of subdivision streets and access to State-maintained roadways. The requirements are meant to ensure that new development maintains the safety and efficiency of the transportation system for the traveling public.
- **[Delaware Manual on Uniform Traffic Control Devices \(DE MUTCD\)](#):** The Delaware MUTCD is based on the federal MUTCD, which provides standards for signs, signals, markings, and other devices used to regulate, warn or guide traffic. Part 9 of the Delaware MUTCD is Requirements for Bicyclist Traffic Control Devices and

covers signs, pavement markings and highway traffic signals specifically related to bicycle operation on both roadways and shared use paths.

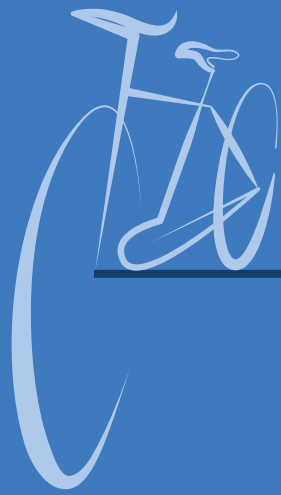
- **Lighting Guidelines:** DeIDOT lighting guidelines for roadways.
- **Standard Specifications:** Specifications associated with each construction item describe the materials to be used and the construction method for that item. Construction items associated with bicycle facilities could include rumble strips, pavement markings, raised pavement markers (RPM), fences, and inlets.
- **Traffic Calming Manual:** Illustrates a series of non-construction and construction measures, with applications and anticipated impacts, advantages and disadvantages.
- **Rumble Strip Design Guidance Memorandum No. 1-18 (2014 update):** Calls for bicycle friendly edgeline rumble strips in new, reconstructed or resurfaced outside shoulders of conventional roadways (not limited access roads). Figures showing details for bicycle friendly rumble strips are included.
- **Bridge Design Manual:** Provides structure design practices specific to the State of Delaware.
- **Roundabout Guidelines:** DeIDOT Division of Transportation Solutions Design Guidance Memorandum No. 1-26 describes potentially suitable locations, inappropriate locations, and locations of special conditions for roundabouts, including "presence of numerous bicycles or pedestrians."

11. Maintenance and Operations

- **Design Guidance Memoranda (DGM):**
 - » #1-21, use of temporary traffic barriers (also see DeIDOT MUTCD, part 6 Section 6F.81)
- **Bicycle Friendly Rumble Strip Policy (2014)**
- **Work Zone Safety and Mobility Procedures and Guidelines (2007):** DeIDOT Traffic Safety reviews/ approves temporary traffic control plans and detour plans, and periodically reviews work zones during construction. The control plan should include bicycle accommodation through the work zone or, if that is not practical, a bicycle detour. The Delaware MUTCD is the primary design guide for work zone traffic control.
- **Answers to snow specific FAQs:** In deciding which roads to plow first, DeIDOT assigns priority levels to each road, taking into account the volume of traffic it typically carries, population density in the surrounding areas and how crucial it is to the functioning of the overall road system.
- **Report a Road Condition:** this webpage on the DeIDOT website is the mechanism for reporting non-emergency/non-urgent maintenance needs. The site also provides the contact information of the DeIDOT Transportation Management Center for urgent needs.
- **Delaware Adopt-a-Bike Path program:** this program allows for volunteer maintenance of bike paths owned by the State of Delaware. The main volunteer activity is clearing paths of debris and litter. The 'Adopt a Bike Path' process is managed under DeIDOT Community Services.



Source: Bike Newark



Part 4

Appendix

Supporting Resources

Delaware Bicycle Plan Wikimap Summary

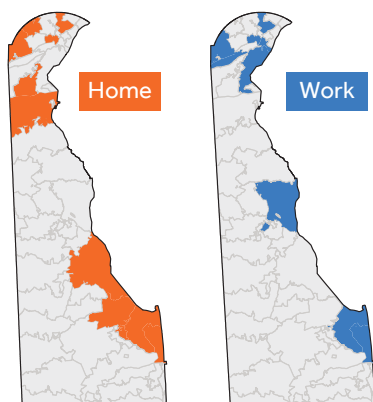
The project team used an online interactive map to gather input from the community on bicycling in Delaware. The Wikimap was live starting in March 2017. This summary

includes information collected through December 2017. The tool is expected to remain open for public input and to inform local and regional planning efforts. Using lines and points Wikimap users were asked to identify barriers and difficult routes for biking. Users were also asked to provide information about their preferred routes.

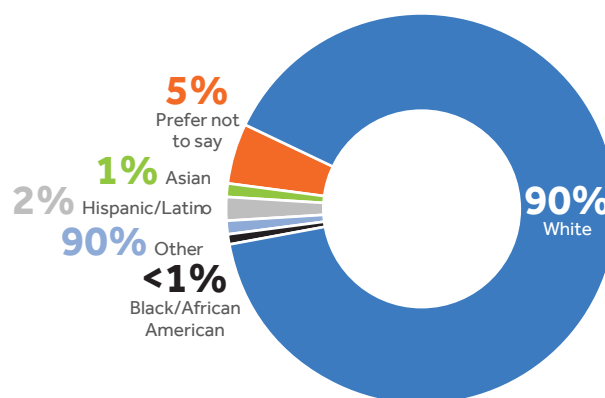
Summary of Respondents

The Wikimap received 218 line comments and 220 point comments from 319 users from many areas of the state. Wikimap users were asked to complete a short survey to help the Study Team understand their background, bicycling habits, and place of residence. The following is a summary of demographic characteristics from respondents:

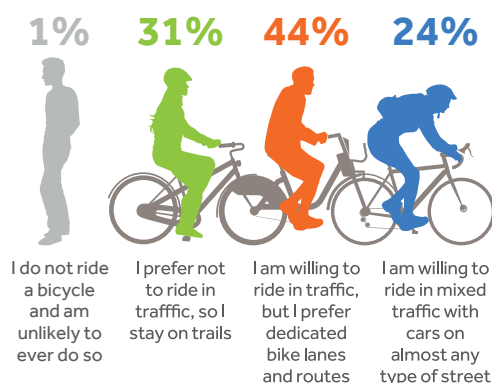
Top 10 Zip Codes



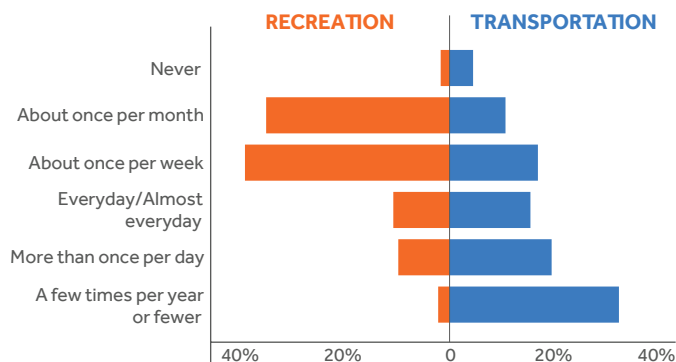
Race/Ethnicity



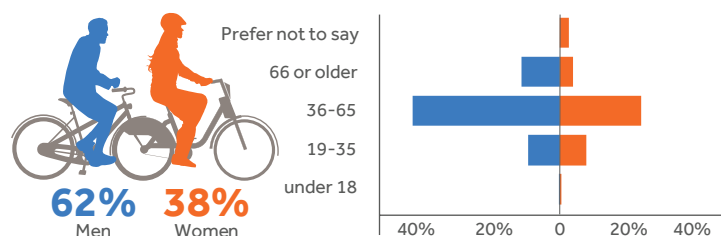
Bicycle Level of Comfort



Biking Practices



Sex/Age



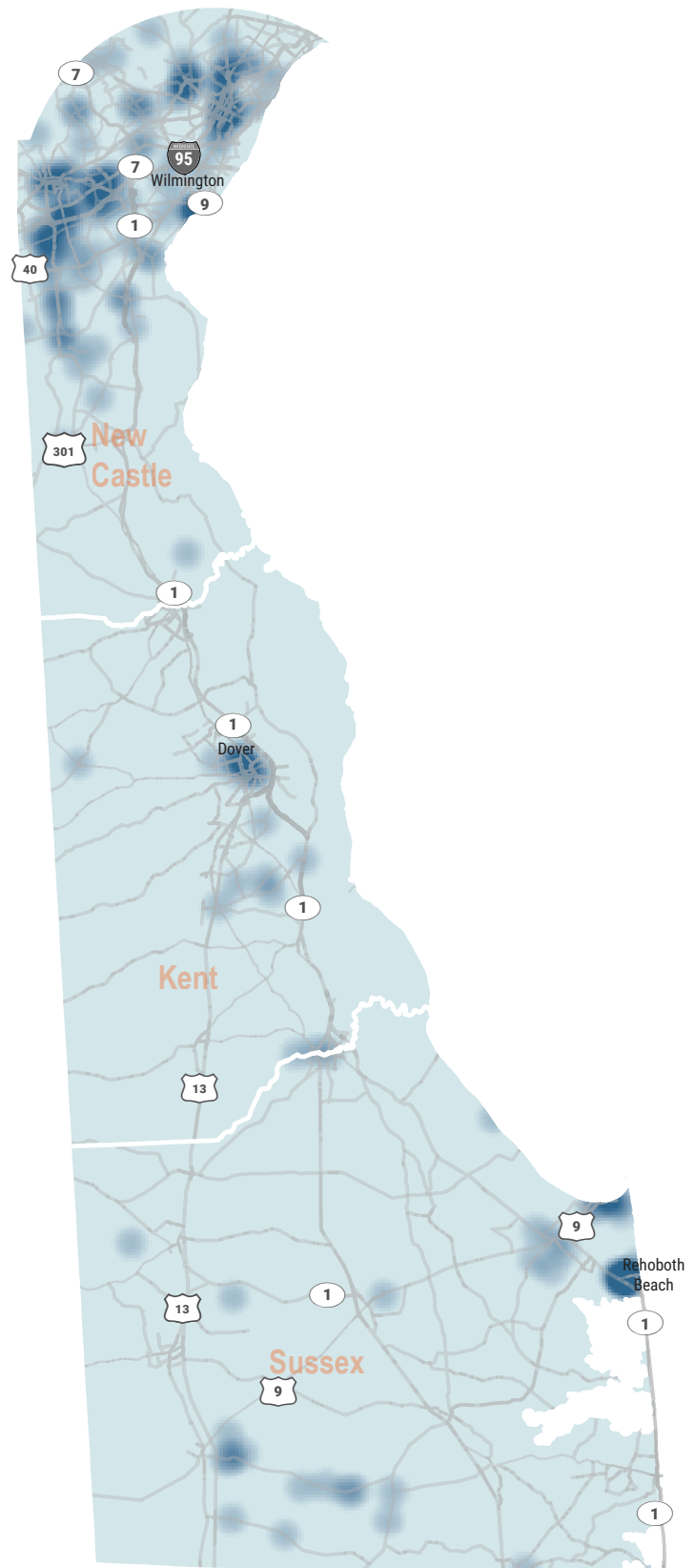
Barriers to Biking

The Wikimap received **220** point comments noting specific locations that represent barriers for people bicycling. Areas receiving the highest number of comments are noted in dark BLUE in the map.

New Castle County received the bulk of the comments. The majority of comments focused on safety concerns at intersections on major roadways including Routes 4, 72, 202, and 896. Wikimap users also noted perceived safety concerns related to high vehicle speeds and heavy traffic.

In **Kent County** the comments received concentrated in the City of Milford where bicyclists noted low yielding rates by motorists at a number of intersections. Here too, high vehicle speeds and heavy traffic were of concern.

In **Sussex County** comments were concentrated in two areas: i) the junction of Route 1, 404, and Route 9, and ii) the junction of Route 1 and Rehoboth Avenue. In both areas, high vehicle traffic and perceived high speeds represented the majority of concerns.



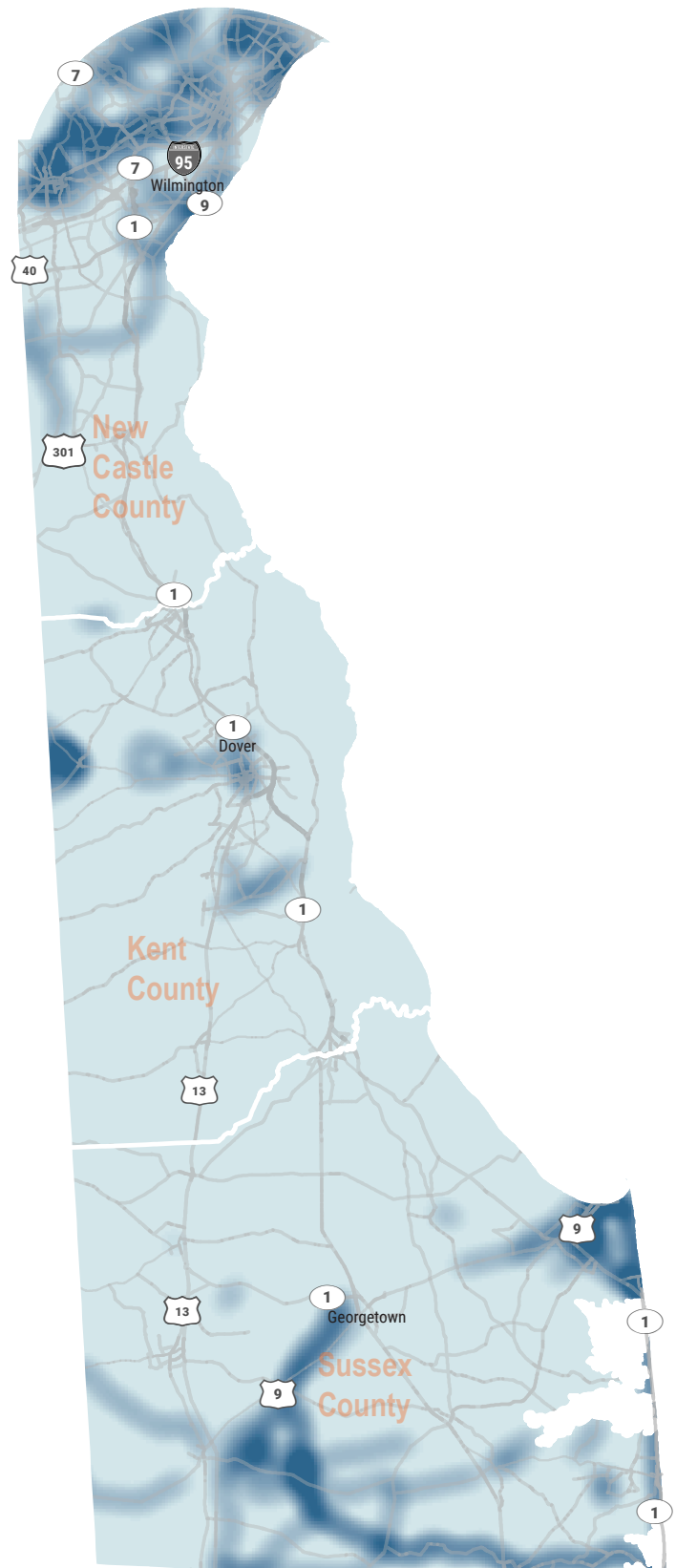
Routes I Bike

The Wikimap received **115** line comments related to routes people like to bike on. Corridors receiving the highest number of comments are noted in dark BLUE in the map.

In **New Castle County** various respondents highlighted Route 2 as their primary bicycle route between Newark and Wilmington. Other routes that received a number of comments include Route 9 and Route 273, near New Castle. It is important to note that, while many of these routes may not provide the most comfortable facilities for people biking, in many places, they are the only available connection between communities.

Most comments received in **Kent County** were from recreational cyclists who enjoyed bicycling for exercise along Routes 302 and 300.

In **Sussex County** many of the comments received concentrated along the Coastal Highway connecting the coastal communities of Rehoboth Beach, Dewey Beach, and Bethany Beach. Other notable corridors included Route 54, as well as some local roadways close to the Town of Laurel.



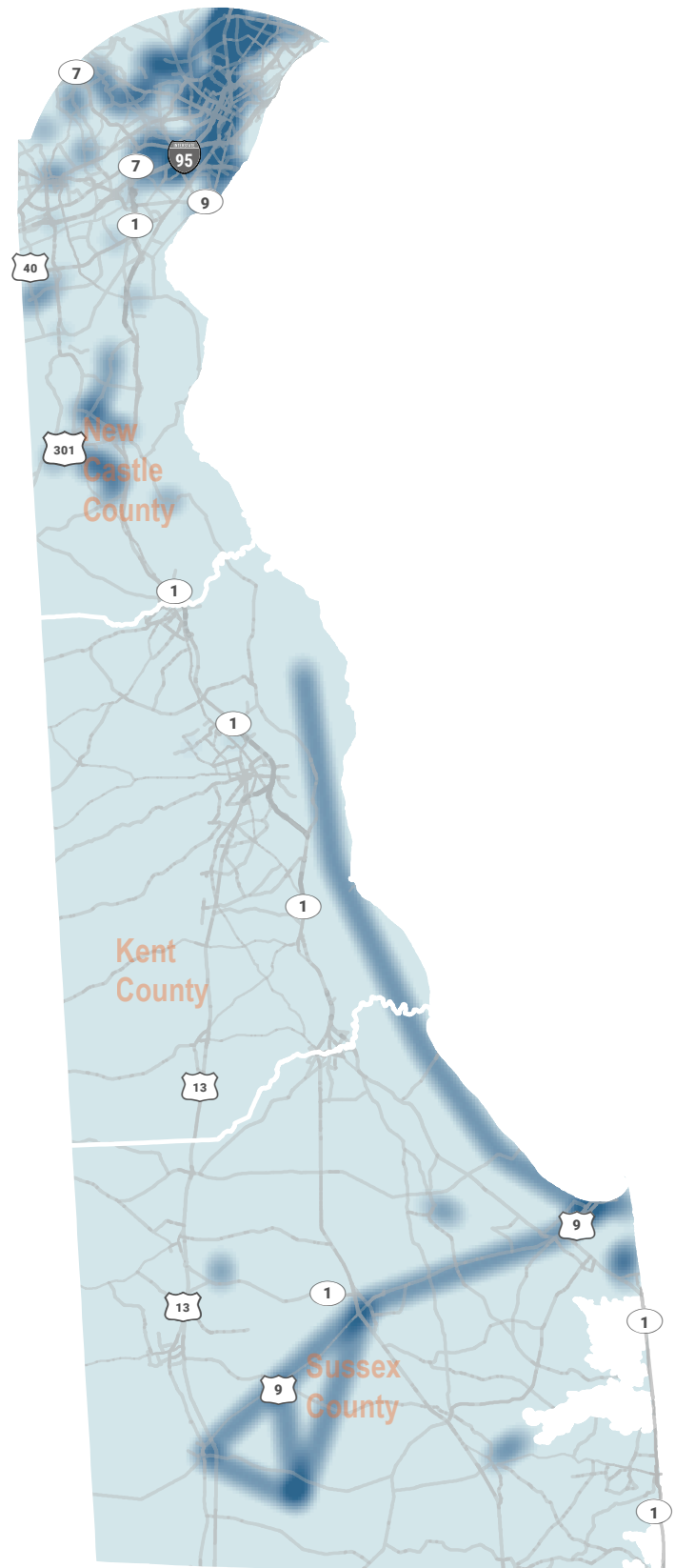
Difficult Routes for Biking

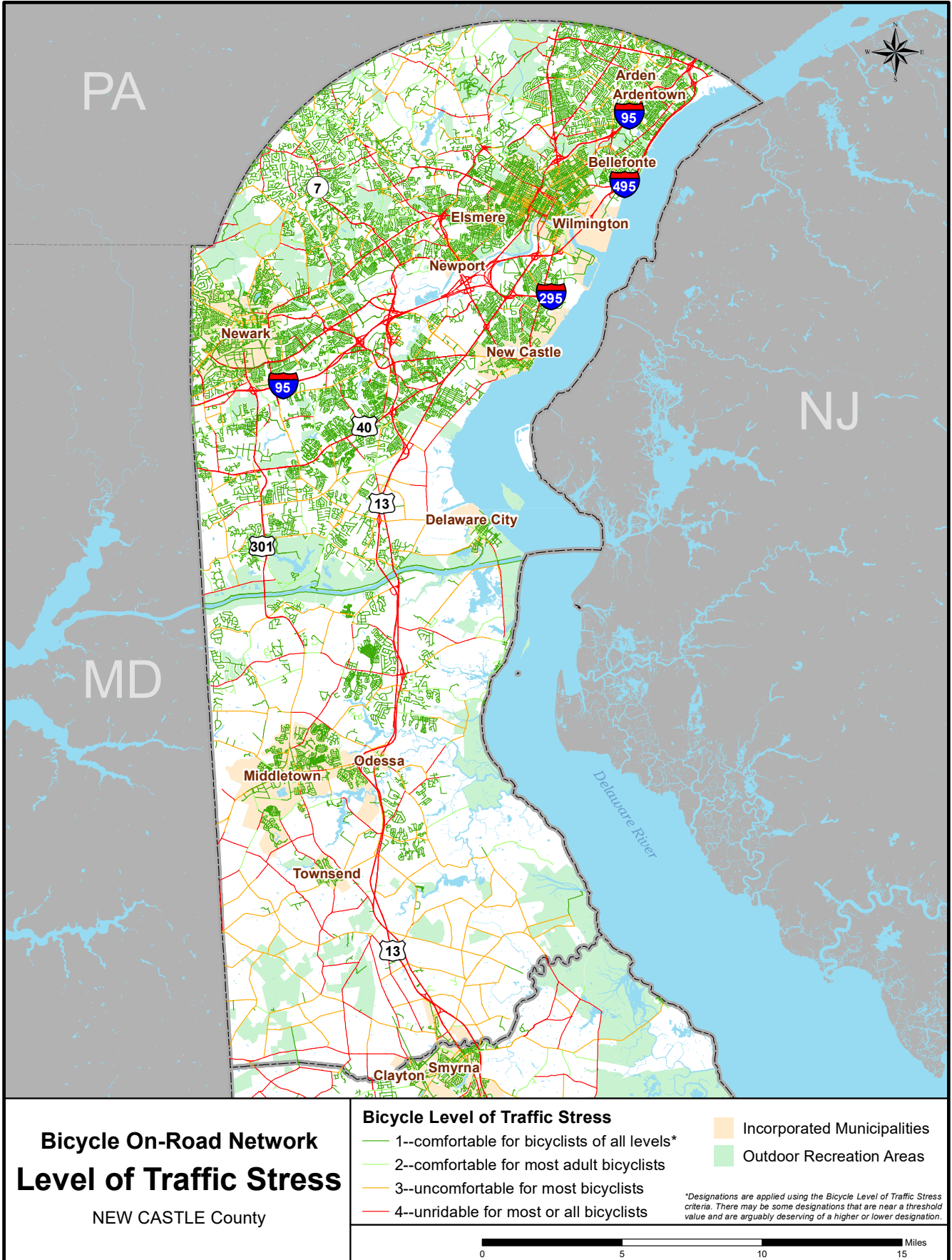
Wikimap respondents were asked to identify roadway corridors that represent barriers for riding their bicycle or where they would like to see additional connectivity. 103 line comments were received. Areas receiving the highest number of comments are noted in dark BLUE in the map.

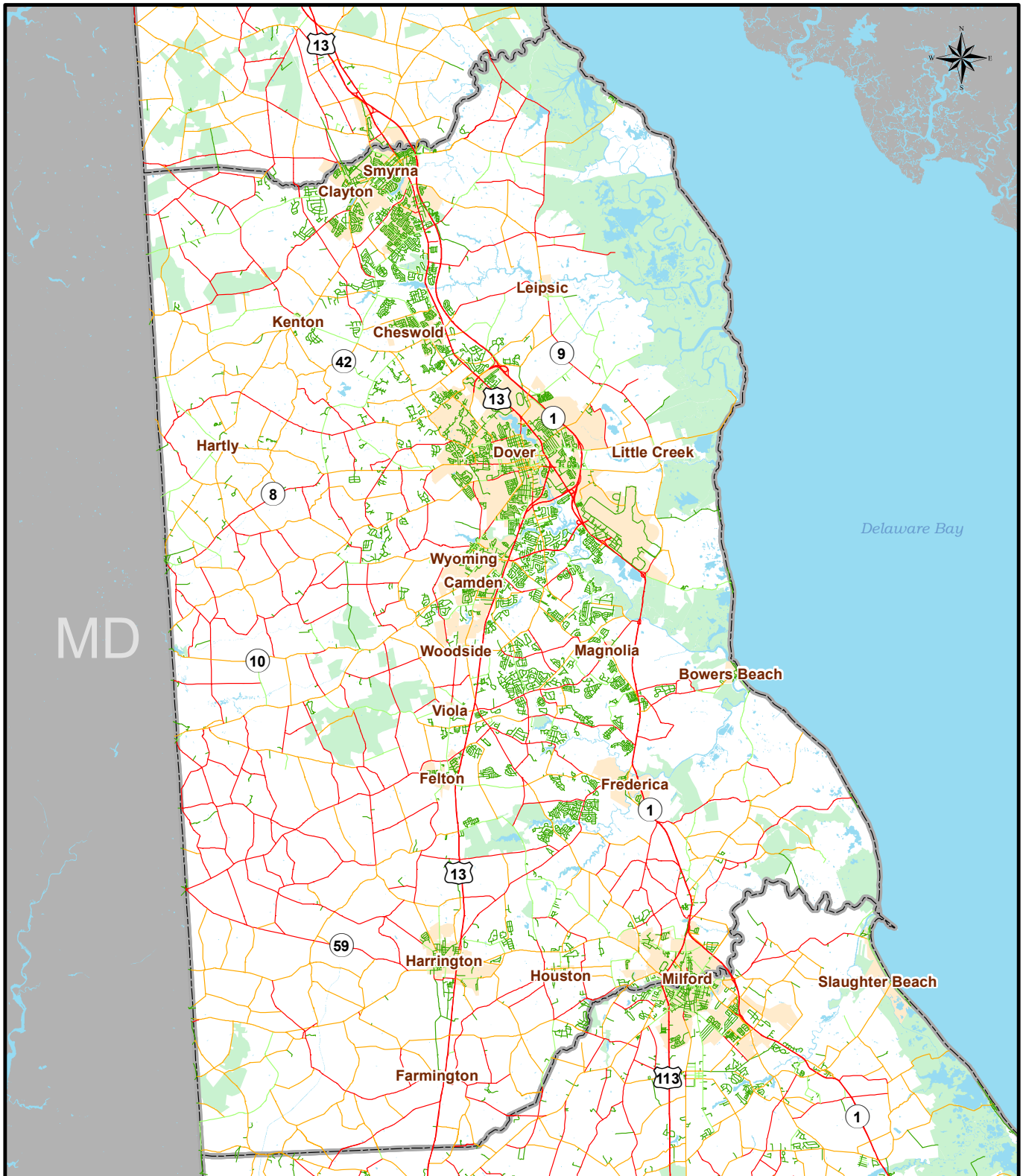
Many of the comments received for **New Castle County** focused on providing better and more comfortable connectivity between Wilmington, Newark, and New Castle along Route 4, Wilmington Road, and Route 72.

A number of residents would like to see a north-south connection along the bay from between **Kent and Sussex Counties**.

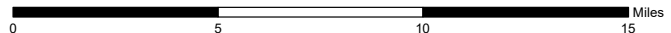
Respondents also noted their desire to see the proposed Georgetown-Lewes trail and its extension built in **Sussex County**.

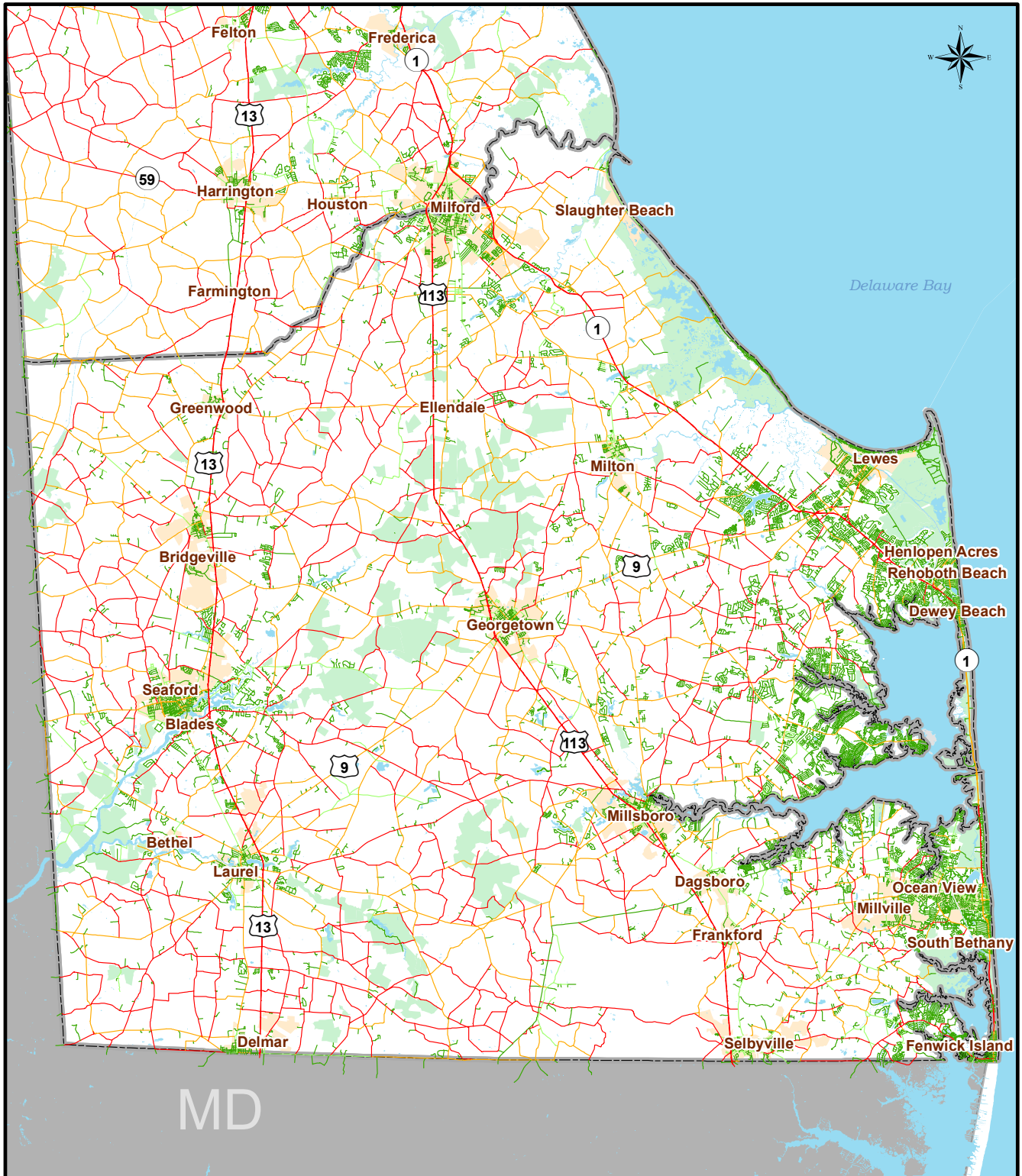






<h3>Bicycle On-Road Network Level of Traffic Stress</h3> <p>KENT County</p>	<p>Bicycle Level of Traffic Stress</p> <ul style="list-style-type: none"> — 1--comfortable for bicyclists of all levels* — 2--comfortable for most adult bicyclists — 3--uncomfortable for most bicyclists — 4--unridable for most or all bicyclists 	<ul style="list-style-type: none"> Incorporated Municipalities Outdoor Recreation Areas
	<p><small>*Designations are applied using the Bicycle Level of Traffic Stress criteria. There may be some designations that are near a threshold value and are arguably deserving of a higher or lower designation.</small></p>	





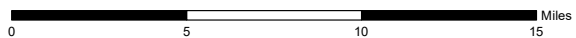
**Bicycle On-Road Network
Level of Traffic Stress**
SUSSEX County

Bicycle Level of Traffic Stress

- 1--comfortable for bicyclists of all levels*
- 2--comfortable for most adult bicyclists
- 3--uncomfortable for most bicyclists
- 4--unridable for most or all bicyclists

- Incorporated Municipalities
- Outdoor Recreation Areas

*Designations are applied using the Bicycle Level of Traffic Stress criteria. There may be some designations that are near a threshold value and are arguably deserving of a higher or lower designation.



Bike lanes and shoulders not adjacent to a parking lane

Number of Lanes	Bike lane width	<25 mph	30 mph	35 mph	40 mph	45 mph	50+ mph
1 through lane per direction or	6+ feet	LTS 1	LTS 1	LTS 2	LTS 3	LTS 3	LTS 3
	4–5 feet	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
2 through lanes per direction and	6+ feet	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	4–5 feet	LTS 2	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4
3+ lanes or 2 lanes undivided per direction	6+ feet	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	4–5 feet	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4

Bike lanes alongside a parking lane

If combined width of bike lane and parking lane is less than 12 ft or if bike lane is blocked frequently, use mixed traffic criteria

Number of Lanes	Bike lane + Parking lane width	<20 mph	25 mph	30 mph	35 mph	40+ mph
1 lane per direction	15+ feet	LTS 1	LTS 1	LTS 2	LTS 3	LTS 3
	14 feet	LTS 2	LTS 2	LTS 2	LTS 3	LTS 4
	12–13 feet	LTS 2	LTS 2 or 3*	LTS 2 or 3*	LTS 3	LTS 4
2+ lanes per direction	15+ feet	LTS 3	LTS 3	LTS 3	LTS 3	LTS 3
	12–14 feet	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4

*LTS = 2 in areas with low parking turnover (e.g., most residential areas); LTS = 3 in areas with high parking turnover (e.g., most commercial areas)

