CONTEXT SHOULD DICTATE **BEST SOLUTIONS FOR PROTECTING CYCLISTS**

By David Watson

Your municipality has adopted a "complete streets" policy, or the Massachusetts Department of Transportation wants to add bicycle facilities to a state-funded roadway project in your town, or perhaps you simply want to make your local roads safer for bicyclists. Does this mean bike lanes on every road? What exactly is a "bike lane"? How do you get started?

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ALL PHOTOS BY DAVID WATSON

If your community has not grappled with these questions yet, it soon will. More than 120 Massachusetts cities and towns have adopted complete streets policies so far, and MassDOT policies and funding programs strongly encourage—and, in many cases, require—bicycle facilities.

Roadway injuries and fatalities have risen sharply over the past several years, and bicyclists are disproportionately represented among the casualties. So it's a good idea to consider protections for bicyclists. The best solutions, however, are not one-size-fits all. There is a range of protection strategies that are best chosen and implemented based on the local conditions.

Lane sharing is clearly marked on Shade Street in Lexington.

Finding the Right Balance

There are some common misconceptions about bike lanes. First, adopting a complete streets policy does *not* mean you must install bike lanes everywhere. Complete streets is a strategy for balancing the needs of everyone using the roadway, including people driving, riding bikes and walking.

Second, "bike lanes" are only one of a range of infrastructure options to improve safety for people riding bicycles. There is no one-size-fits-all bike lane; the appropriate solution is entirely dependent on the context. And the context comprises many factors, such as the type of community (e.g., urban, suburban, rural), immediate surroundings, traffic speeds and volumes, current and projected bicycle volumes, the potential for increasing biking, and how bicycling fits into the overall vision for your community.

Planning and Public Engagement

A municipality can certainly jump right to implementing bicycle facilities, particularly when there is an urgent and obvious safety issue, but doing some planning and prioritization will make the most of scarce infrastructure funding and will more effectively meet the needs of the community. This can range from a prioritization plan that identifies key bicycle infrastructure projects, to a bicycle network plan that maps out all the current and proposed bicycle connections throughout a municipality, to a bicycle master plan that integrates infrastructure plans with policies and programs to support bicycling. Each of these planning processes presents opportunities for public engagement to gather input, respond to community concerns and build public support.

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Public engagement in bicycle planning, and in complete streets planning generally, has three major benefits:

1. The public is an essential resource to help you identify and prioritize infrastructure needs.

2. The process provides an opportunity for a municipality to educate the public about the complete streets approach to roadway design.

3. The process can build public support by raising potential issues and responding to concerns.

There are objective data sources to help zero in on needed projects, such as MassDOT crash data and the Metropolitan Area Planning Council's Local Access Score—and, in some communities, local bicycle counts. But to really understand where people want to ride bicycles and what is preventing them from doing so, there is no substitute for asking them directly.

A good place to start is with local advocates for bicycling and complete streets. Many communities have a core group of people who are already engaged in bike safety issues and have ideas about what needs to be done. A municipality may choose to form a bicycle advisory committee, to bring together local advocates and municipal officials regularly and establish a base for long-term bicycle planning efforts. Complete streets has implications for many disciplines, so consider including a wide range of departments in

Bicyclists use dedicated bike boxes at Washington Street intersection in Somerville.

A protected bike lane, between the curb and sidewalk, runs along Western Avenue in Cambridge.

the committee, including planning and economic development, public works, public health, schools, parks and recreation, public housing, and public safety.

For a specific project or planning effort, there are many tools available for public engagement. Traditional public meetings remain important, but there are many options for reaching a broader cross-section of the community and making the engagement interactive. Design charrettes let non-professionals offer creative solutions to complex problems. Web-based mapping and public input tools provide an outlet for people who cannot attend meetings. Pop-up demonstration projects let people actually experience what a proposed project might be like. Public surveys help focus on what is most important to the community. Direct outreach to priority populations ensures that no one is left out of the process.

A Hierarchy of Protection

Designs for bicycle facilities generally fall into the following three categories, creating a hierarchy of protection for bicyclists from least to most protection:

- Shared bicycle facility
- Dedicated bicycle facility
- Protected bicycle facility

The context dictates the appropriate level of protection for a given roadway or intersection. Cost may be a factor in the selection of a bicycle facility, but the selected design should be one that provides the indicated level of protection or it may not achieve the desired safety outcomes.

There are many great resources for bicycle facility design (see sidebar) and engineers with specific experience designing bicycle facilities, but a few examples provide a sense of the range of possibilities.

Shared Facilities: Shared bicycle facilities are intended for use where traffic volumes and speeds are low, such as quiet rural roads or neighborhood streets. All streets are, fundamentally, shared space, and sometimes the right context-based choice is to leave a street as is, without any bicycle facilities.

For example, Shade Street in Lexington is a two-way residential street with no curbs, no sidewalks, no on-street parking and no centerline. Striped shoulders provide a buffer for pedestrians, and motorists and bicyclists share the travel lane. Vehicle speeds are kept low by a series of speed humps.

Scott Street in Cambridge is also a two-way residential street, but it has curbs, sidewalks and on-street parking. It has advisory bike lanes that are effectively part of the travel lane, but the design encourages motorists to move to the center of the roadway—and out of the bike lanes—as oncoming traffic permits.

Dedicated Facilities: As traffic speeds or volumes increase, or if there are known safety issues that cannot be effectively addressed with a shared bicycle facility, dedicated bicycle facilities *visually* separate cars and bikes. Bicyclists and motorists can freely move in and out of each other's dedicated space as needed, such as a bicyclist leaving a bike lane to position for a left turn, or a motorist crossing a bike lane to park. Dedicated bicycle facilities provide no physical protection for bicyclists, but can establish strong visual cues to guide interactions between bicyclists and other roadway users.

Massachusetts Avenue in Arlington is a good example of what usually comes to mind when people hear "bike lanes." It is a major arterial with significant traffic volume, though generally moderate speeds. Along with other complete

streets features, this project features striped bike lanes adjacent to on-street parking, with green coloration at intersections for added visibility.

Dedicated facilities include specialized intersection treatments to assist bicyclists with turns and to increase visibility. Examples include two-stage left turns on Binney Street in Cambridge and bike boxes with advance stop lines on Main Street in Cambridge and Washington Street in Somerville.

Protected Facilities: Protected bicycle facilities take the idea of separating modes one step further by *physically* separating cars and bikes. The physical separation is accomplished by adding a vertical element between the different users, such as curbs, bollards, landscaping or even parked cars. Pay particular attention to intersections and transitions in and out of protected bicycle facilities, where the potential for conflict is greatest.

Binney Street and Western Avenue in Cambridge are examples of protected bike lanes separated from motor vehicle traffic by both a curb and parked cars. A demonstration project on Massachusetts Avenue in Cambridge shows a bike lane separated from traffic and parked cars by removable flexible posts in a painted buffer.

Bike Parking

An often-overlooked but essential component of a bicycle network is bicycle parking. No matter how good your network is, people must have safe and convenient places to lock their bicycles when they arrive at their destinations.

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A bike corral uses shoulder space in Somerville.

BICYCLE FACILITY PLANNING AND DESIGN RESOURCES

Massachusetts-specific

MassDOT *Complete Streets Funding Program Guidance*
tinyurl.com/massdotcomplete

MassDOT *Project Development and Design Guide*
tinyurl.com/massdotdesignguide

MassDOT *Separated Bike Lane Planning and Design Guide*
tinyurl.com/massdotbikelane

Boston Complete Streets Design Guidelines
Bostoncompletestreets.org

MAPC's Local Access Score
localaccess.mapc.org

National

NACTO *Urban Bikeway Design Guide*
nacto.org/publication/urban-bikeway-design-guide

FHWA *Small Town and Rural Multimodal Networks*
tinyurl.com/fhwa-smalltown

AASHTO *Guide for the Development of Bicycle Facilities*
tinyurl.com/aashto-bike

FHWA *Separated Bike Lane Planning and Design Guide*
tinyurl.com/fhwa-bike-lane

FHWA *Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts*
tinyurl.com/fhwa-multimodal