

PBOT

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From: Wendy Cawley, P.E., City Traffic Engineer
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Subject: Policy and Guidance for Protected Bicycle Lanes

In 2015 PBOT Director Leah Treat asked PBOT staff to ***“make protected bicycle lanes the preferred design on roadways where separation is called for.”*** Since that time staff has prioritized protected bicycle lanes as the preferred design for roadways that require separation between people bicycling and motor vehicles.

This memo formalizes PBOT’s preference for separated bicycle facilities and offers contextual guidance for the implementation of protected bicycle lanes in Portland, including exceptions to the provision of protected lanes.

Definition of Protected Bicycle Lanes

For purposes of this memo, protected bicycle lanes are defined as “an exclusive facility for bicyclists that is located within or directly adjacent to the roadway and that is physically separated from motor vehicle traffic with a vertical element.” (Federal Highway Administration, *“Separated Bike Lane Planning and Design Guide”*, May 2015.) FHWA identifies that the terms “protected bicycle lane”, “separated bicycle lane” and “cycle track” are interchangeable and identify the same facility type.

Policy Context

Portland’s Comprehensive Plan and the Transportation System Plan have recently been updated. Their adoption recognizes several policies and objectives first identified in the Portland Bicycle Plan for 2030, which was adopted by Resolution in 2010 (Resolution 36763). Protected bicycle lanes are both supportive of and responsive to these policies and objectives, specifically:

Comprehensive Plan	Transportation System Plan
Policy 9.6 Transportation strategy for people movement	Objective 9.5.a Major City Bikeways
Policy 9.20 Bicycle transportation	Objective 9.5.b City Bikeways
Policy 9.21 Accessible bicycle system	

Experience

Portland has been implementing protected bicycle lanes since 2009 based on international cities reporting that protected bicycle facilities are effective in attracting “interested but concerned” people to use bicycles for daily transportation. With increased focus on developing and implementing protected bicycle lanes, PBOT staff continues to grow their level of expertise in the design of protected bicycle facilities. This expertise is reflected in [Portland Protected Bicycle Lane Design Guide \(2018\)](#) and in the recent update of the Traffic Design Manual, both of which provide design guidance for protected bicycle facilities. Design guidance is also found at the federal level in the above-mentioned “*Separated Bike Lane Planning and Design Guide*” and the “*Urban Bikeway Design Guide*” (NACTO, 2010), which was adopted by PBOT in 2012 as a design guidance document. Portland has also benefitted from the “*Separated Bike Lane Planning & Design Guide*”, developed by the Massachusetts Department of Transportation (2015).

There has been a growing research effort to look at the effectiveness and safety of protected bicycle lanes. A comprehensive study conducted by the National Institute for Transportation and Communities (“*Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the U.S.*”, 2014) demonstrated both safe intersection operations and the ability of protected bicycle lanes to replace non-bicycle trips with bicycle trips. This is consistent with desired outcomes of city policies.

Contextual Guidance

Protected bicycle lanes are appropriate on any roadway where separation between people bicycling and people driving is called for. These types of facilities are identified in the Portland Bicycle Plan for 2030 as a category of “separated in-roadway” bikeways. This broad term covers all types of in-roadway separation, including protected bicycle lanes, buffered bicycle lanes and standard bicycle lanes.

In 2017 the National Association of City Transportation Officials (NACTO) published contextual guidance to identify the conditions under which protected bicycle lane and other facilities are most appropriate. That document, “*Designing for All Ages & Abilities: Contextual Guidance for High-Comfort Bicycle Facilities*” includes a table that is replicated in the Portland Protected Bicycle Lane Planning and Design Guide. This table copied above, will inform decisions about the appropriate facility based on roadway conditions.

Contextual Guidance for Selecting All Ages & Abilities Bikeways				
Roadway Context				All Ages & Abilities Bicycle Facility
Target Motor Vehicle Speed ^a	Target Max. Motor Vehicle Volume (ADT)	Motor Vehicle Lanes	Key Operational Considerations	
Any		Any	Any of the following: high curbside activity, frequent buses, motor vehicle congestion, or turning conflicts [‡]	Protected Bicycle Lane
< 10 mph	Less relevant	No centerline, or single lane one-way	Pedestrians share the roadway	Shared Street
≤ 20 mph	≤ 1,000 – 2,000		Single lane each direction, or single lane one-way	< 50 motor vehicles per hour in the peak direction at peak hour
≤ 25 mph	≤ 500 – 1,500	Low curbside activity, or low congestion pressure		
	≤ 1,500 – 3,000			Buffered or Protected Bicycle Lane
	≤ 3,000 – 6,000			Protected Bicycle Lane
	Greater than 6,000	Multiple lanes per direction	Low curbside activity, or low congestion pressure	Protected Bicycle Lane, or Reduce Speed
Greater than 26 mph [†]	Any			
		≤ 6,000	Any	Any
High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts	Any	Any	High pedestrian volume	Biike Path with Separate Walkway or Protected Bicycle Lane
			Low pedestrian volume	Shared-Use Path or Protected Bicycle Lane

^a While posted or 85th percentile motor vehicle speed are commonly used design speed targets, 95th percentile speed captures high-end speeding, which causes greater stress to bicyclists and more frequent passing events. Setting target speed based on this threshold results in a higher level of bicycling comfort for the full range of riders.

[†] Setting 25 mph as a motor vehicle speed threshold for providing protected bikeways is consistent with many cities' traffic safety and Vision Zero policies. However, some cities use a 30 mph posted speed as a threshold for protected bikeways, consistent with providing Level of Traffic Stress level 2 (LTS 2) that can effectively reduce stress and accommodate more types of riders.¹⁰

[‡] Operational factors that lead to bikeway conflicts are reasons to provide protected bike lanes regardless of motor vehicle speed and volume.

Figure 1. Contextual Guidance for Selecting All Ages & Abilities Bikeways. From "Designing for All Ages and Abilities, Contextual Guidance for High-Comfort Bicycle Facilities", NACTO, December 2017

Exceptions

The design and construction of protected bicycle lanes can be challenging and not always achievable. In some cases, funding may be insufficient; in other cases, the necessary trade-offs may be untenable. That said, protected lanes should be the starting point for planning and design on roadways where separated bicycle facilities are recommended.

Where protected bicycle lanes are the desired facility type but are not provided, the following will be required:

- Design documentation with rationale for why the recommended facility type cannot be provided.
- Mitigation measures, such as protection or turn calming at intersections
- File design documentation with project documentation and provide a copy to the PBOT Bicycle Coordinator.