

Enhanced Bicycle Boulevard Markings Demonstration Project

Background

According to Title 16 of Portland's City Code, Portland's bicycle boulevards are roadways "with low vehicle traffic volumes where the movement of bicycles is given priority." "Priority" is defined by the Compact Oxford English Dictionary as "the condition of being regarded as more important," or "a thing regarded as more important than others" or "the right to proceed before other traffic." Despite this definition and despite the treatments PDOT has provided on our bicycle boulevard streets, people riding bicycles on these streets all too often do not feel as if they are more important than are motorists on the street. This feeling arises, in part, from the conventional assumption that motor vehicles, as fast and powerful vehicles, should have the right of way and therefore generally are rightfully accorded higher importance on our roadways. This plays out in an environment on our bicycle boulevards that may experience higher than desirable traffic volumes and higher than desirable speeds. Under these conditions, cyclists feel motorists "breathing down their necks" and wishing to pass. Speeding motorists, motorists passing cyclists too closely, and motorists behaving aggressively are among the common complaints heard from cyclists about conditions on some of our bicycle boulevards.

This lack of functional priority may arise also from the fact that neither motorists nor cyclists understand that our bicycle boulevards are truly designed to provide cyclists with priority on the street. What would/should it feel like from the cyclist's perspective to have priority on bicycle boulevard streets? Priority for bicyclists on bicycle boulevard streets should mean:

- Cyclists should not have to ride in the door zone along the roadway
- Cyclists should be able to ride side-by-side to enjoy the social aspects of bicycling
- Cyclists should be able to ride at a speed at which they are comfortable
- Cyclists should receive greater priority crossing arterial streets
- Cyclists should feel that it is easy, clear, and logical to cross major intersections and they shouldn't have to wait long to do so
- Cyclists should not feel uncomfortable on the roadway because of fast-moving motor vehicles

Our job at PDOT is to create conditions that establish priority for cyclists on our boulevard streets. The manner in which people ride their bicycles on bicycle boulevards speaks volumes about who has priority on the streets. PDOT needs to design these roadways so that cyclists are encouraged to assert their priority, and motorists clearly understand that cyclists do have priority. We will do this through engineering, education, and operations. Thus, the intent of this test will be to create clear and obvious conditions on our bicycle boulevards such that motorists and cyclists both clearly understand that cyclists are to have priority on bicycle boulevards. By understanding this priority the goal will be to encourage cyclists to assert their priority and motorists to yield it.

Test Elements

This test proposes liberal use of the following markings on a number of streets:

- Shared lane markings
- Speed limit advisory markings
- Bicycle crosswalk markings.

1. Shared Lane Markings

One of the chief complaints about the one-foot diameter bicycle boulevard markings is that they are too small to communicate to motorists that such streets are intended for high bicycle use. This test will use the shared lane markings to communicate to motorists that boulevard streets are clearly for bikes.

Shared lane markings communicate the same message to motorists and cyclists on boulevard streets as they do on arterial streets. The message to cyclists is: “you belong in the middle of the travel lane.” The message to motorists is: “expect cyclists to legitimately be in the middle of the travel lane.”



Figure 1. Berkeley Boulevard Marking

Thus, the advantage of using shared lane markings on both boulevards and collectors is consistency: the message is the same. All that’s different are the volumes and speeds on the roadway.

These will be employed on the bicycle boulevard street immediately following intersecting collector streets at a frequency to be determined.

2. Fifteen Mile per Hour Advisory Speed

Almost all cyclists ride at well less than 20 mph. Most travel at less than 15 mph. Decreasing the speed differential between motorists and cyclists is an essential element to improving conditions for bicycle riding on boulevards as well as for communicating to motorists that conditions on this roadway are different and quite slow. Roadways in the Netherlands that worked well for cyclists had regulatory speed limits of 30 kilometers per hour, which translated to approximately 18.5 mph.



Figure 2. London Pavement Speed Markings

The Bicycle Boulevard Markings Test will use large markings on the roadway to set an “advisory speed limit.” The roadway markings have the advantage of being more clearly seen by motorists and cyclists than signs, and also provide a stronger visual message than signs as to the desired behavior.

These will be employed prominently and intermittently along the boulevard streets in tandem with the shared lane markings at a spacing to be determined.

3. Bicycle “Cross-Walks”

One of the more difficult elements of riding on a bicycle boulevard is crossing collector or other high-volume cross-streets. Since we first began using curb extensions and other civil

improvements to facilitate such crossings we have observed positive unintended consequences. Rather than simply shortening the crossing distance—and thus increasing the number of suitable crossing gaps—the presence of cyclists adjacent to curb extensions and similar civil works often results in motorists stopping on the collector to provide cyclists an unfettered crossing. Such motorist behavior is both the desire and requirement when pedestrians are present at a marked crosswalk. The intent of using “bicycle crosswalks” is to see if they similarly encourage yielding behavior to cyclists in the absence of other civil improvements. They would be used on lower volume collectors where the number of gaps is not so low as to require our standard crossing treatments, but not high enough such that cyclists wouldn’t expect to be delayed while waiting for a gap.



Figure 3. London Bike Markings

Using such a treatment is based on observations and experiences that many Portland drivers are willing to be polite and generous in their behavior toward cyclists. All that’s needed to encourage such behavior are the appropriate visual cues. Curb extensions and the prominent position they provide cyclists at an arterial crossing are such a cue; marked crossings may be another such cue that could be implemented relatively inexpensively and effectively at boulevard crossings of relatively minor collector streets. Portland already has an example of a similar treatment in place at NE 21st & Tillamook (Figure 4). In that case, the markings direct cyclists to the most direct crossing of 21st Avenue. However, motorists occasionally stop when they see the cyclist waiting to cross.



Figure 4. NE 21st & Tillamook

These will be employed for crossings of selected collector streets where crossing opportunities are greater than 60 per hour¹.

Measurable Goals

To test new techniques that collectively may result in realizing the following quantifiable goals:

- Decreased automotive speeds on streets treated for bicycling
- Decreased automotive volumes on streets treated for bicycling
- Increased bicycle use on streets treated for bicycling

¹ Another helpful treatment would be to stripe bicycle stop bars for crossings currently treated with curb extensions so that cyclists know where to appropriately position themselves in order to take advantage of the decreased crossing distance offered by such treatments when used correctly. This lack of understanding of how to make best use of curb extensions as a crossing treatment was discussed at the April, 2007 Bicycle Master Plan Network Ride. The markings at 21st & Tillamook are helpful in positioning cyclists to take best advantage of the crossing there.

As well as the following qualitative goals:

- Increase the visibility of bicycle boulevard streets to motorists and cyclists alike.
- Truly create a roadway where it feels like “the movement of bicycles is given priority,” in accordance with 16.90.030.

Test Protocol

The following types of streets will be tested with the above techniques:

- An existing bicycle boulevard that is functioning near the limits of traffic volumes and speeds;
- A roadway classified as City Bikeway for which Bicycle Boulevard is the recommended treatment but that has not yet been so treated
- A roadway classified as a Local Service Bikeway, identified on our family friendly bikeway maps as a “Lower Traffic Street/Shared Roadway.

Data to be collected both before and after installation of markings:

Quantitative Data

1. Automotive volumes
2. Automotive speeds
3. Bicycle volumes
4. No. of motor vehicles stopping to allow cyclist crossings at collector streets

Qualitative Data

1. Survey of cyclists to assess their satisfaction with conditions along the roadway.

Test Partners

Work with Jennifer Dill/PSU/Institute for Bicycle and Pedestrian Innovation to gather and evaluate data.

Work with North Carolina Highway Safety Research Institute.

Funding for work orders/materials would come from Missing Links project.