



Date: September 4, 2013

To: Hanover Board of Selectmen
Peter Kulbacki, Director of Public Works

From: Carolyn Radisch, AICP

RE: 'Suggestion Lanes' Pilot Test on Valley Road

Background

The Town of Hanover Bicycle and Pedestrian Advisory Committee have been working to improve walking and bicycling in Hanover. One of the biggest challenges in accommodating bikes and pedestrians in Hanover revolves around many narrow street right-of-way and relatively sparse street network. Adding bike lanes and paths, designating bicycle boulevards, putting in sidewalks is often a challenge in these conditions. One of the ideas set forth in the Pedestrian and Bicycle Master Plan (2012) and Safe Routes to School Travel Plan (2013) to improve bicycle travel, particularly to the schools, is to consider the use of 'Suggestion Lanes' on streets such as Rip Road and Curtiss Road.

Suggestion Lanes

Suggestion Lanes, also called Bicycle Advisory Lanes, are used in Europe and extensively in the Netherlands where there is not adequate space for two lanes of traffic and two bicycle lanes:



The dashed white lines divide the road into two side zones (for bikes) and a central zone that is shared by cars. (Note: the red lane is not proposed here; in the Netherlands red paving is used to demarcate all bike facilities). With this treatment motorists ride in the center of the road – away from the sides where there are bikes and pedestrians. When a motorist approaches from the opposite direction, they cross the dashed lines, yielding to any bikes, pass, and then return to the middle of the road. While this sounds like a great departure from the current situation, it is the way most people drive on narrow streets when they encounter a bike. As described in the attached article, nothing is mandated or required of any user, but by suggesting that cars travel in the center of the road, we create a better environment for users at the edge of the road.

A full explanation is described in the attached excerpt from an article written by Professor Peter Furth of the Northeastern University College of Engineering. (Furth, Peter G., *Bicycle Priority Lanes: A Proposal for Marking Shared Lanes*, January 2008.) Additional information is available at: <http://sustainabletransportationholland.org/topics/bicycle-advisory-lanes>

Why do we want to do this?

We give more vulnerable travelers, namely bicyclists and pedestrians, a better environment by moving motorists away from the edges of the road. We decrease bicyclist stress by identifying a bicycle zone, albeit a zone that is shared when necessary with motor vehicles. As Professor Furth notes in the attached article “...the net effect is to give bicyclists a zone in which they have priority over motor traffic – all by the power of suggestion, using the magic of lines...” Valley Road, Rip Road and Curtiss are important links in the Town bicycle and pedestrian network. There is not space for formal sidewalks and bicycle lanes; but the streets merit additional attention to improve conditions for bicyclists and pedestrians. Rip Road is an important link to the Ray and Richmond Schools and Storrs Pond – both important destinations for children. The goal is to make these destinations more accessible and attractive to bicyclists.

What about pedestrians?

Pedestrians also benefit by moving motor traffic away from the edges of the roads. Pedestrians walk facing traffic; the bicycles ride with traffic, so they are facing each other at the side of the road. Again, this is like the current situation.

What are the design criteria?

- Bike network streets where lanes or paths are not feasible
- In-town streets with speed limits up to 30 mph
- Streets with ADT between 3,000 and 6,000 vehicles per day

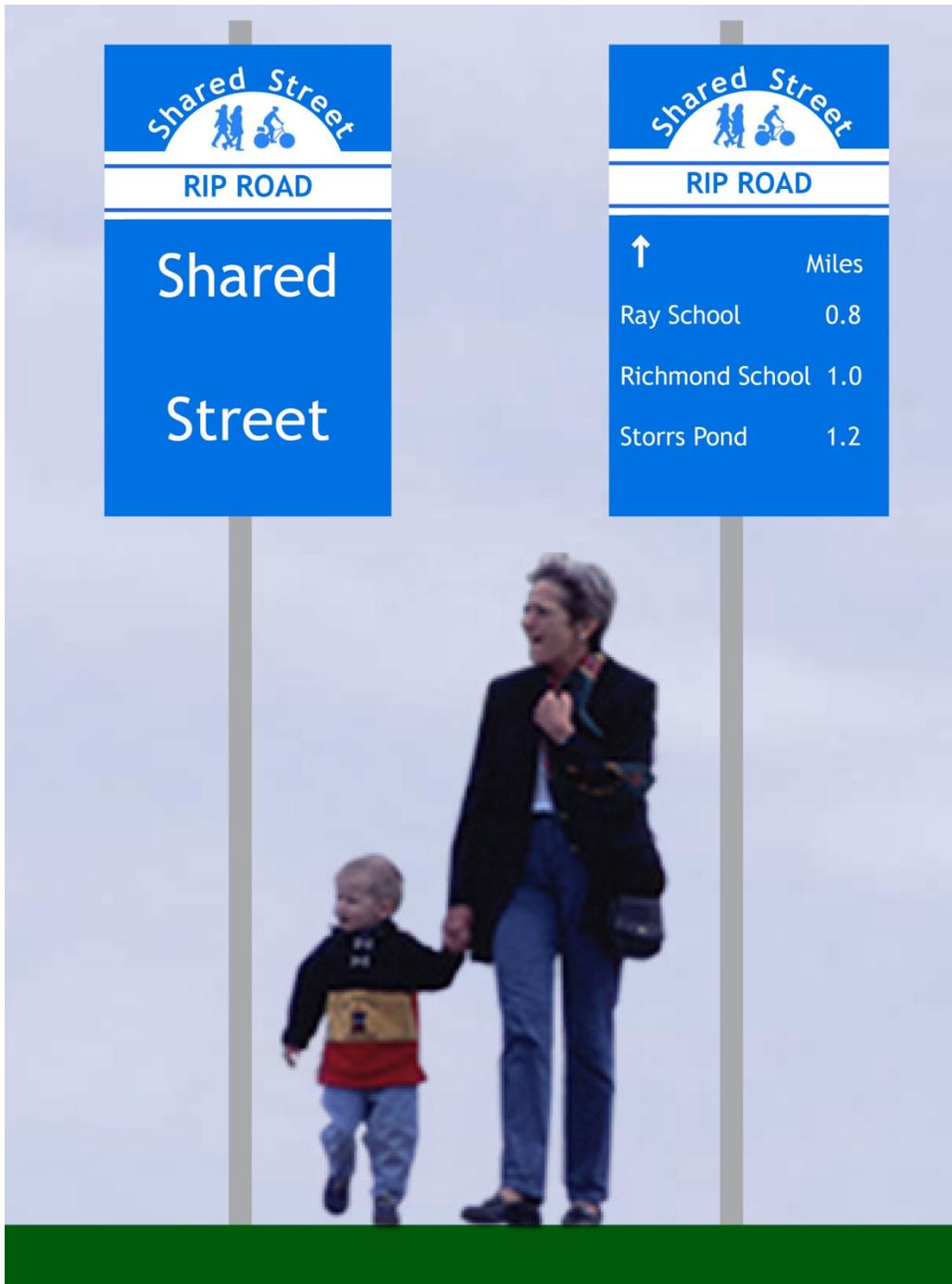
What about signs?

I asked Professor Furth about signage and received the following response:

I have never seen signs used with this treatment. It should be self-explanatory and not over-regulated. Cyclists and (if there are no sidewalks) pedestrians will go where they're supposed to without need for signs. Drivers should take advantage of the flexibility offered by dashed lines to drive wherever they want, subject to the overriding rules of (1) keep to the right when

encountering an opposite direction vehicle, and (2) don't run over a ped or cyclist on your right. We hope that drivers will keep to the middle when not encountering other traffic, but we don't want to tell them they're supposed to.

We can evaluate signage within the context of our town. A simple sign showing bikes and peds on the side and a car in the center may be advisable. In the long run, a non-regulatory signage approach that identifies these streets as bicycle / pedestrian shared zones may be desirable as well. This was done very effectively for Bicycle Boulevards in Berkeley, CA.



What is the proposal?

We recommend a test of this concept on Valley Road where traffic volumes are quite low. The test would consist of two 5' foot dashed lanes with a 10' center lane. The Hanover Bike/ Pedestrian Committee would work with the Town on public outreach for this test. Depending on the results of the test, the treatment would be considered for Rip Road.

Attachment: Excerpt from: *Bicycle Priority Lanes: A Proposal for Marking Shared Lanes*, Furth, Peter G., January, 2008.

Dutch “Suggestion Lanes”

The primary inspiration of the Bicycle Priority Lane marking is the “suggestion lane” marking used in the Netherlands, shown in Figures 5-7. Like the proposed Bicycle Priority Lane, suggestion lanes delineate a bicycle zone within an automobile travel area using a broken line boundary and sometimes colored pavement. Like the proposed Bicycle Priority Lane, they have no legal standing (i.e., they neither require bicycles to ride in them, or motorists to stay out of them) (11). Suggestion lanes differ from formal bike lanes in that the former have no bicycle symbol marking, nor do they have a sign indicating bicycle lane. Their name, “suggestion lane” (Dutch: suggestiestrook) deliberately omits the word “bicycle.”



Figure 5: Suggestion lanes on minor rural roads. Notice how the centerline has been obliterated. The road on the right, with a narrower cross section, has narrower suggestion lanes so that the central zone will appear wide enough to seem like a normal-width driving lane.

However, the power of lines to suggest a bike lane is strong; virtually all road users, bicyclists and motorists, recognize it as a bike lane, and also recognize that cars may enter when doing so wouldn't interfere with a bike. Some suggestion lanes are paved with red asphalt, the color used routinely on formal bicycle lanes and roadside bike paths, further adding to the power of suggestion.



Figure 6. Suggestion lane on a busy suburban two-way road in Nootdorp. Cars stay out of the suggestion lane when passing bikes, and then enter it in order to pass oncoming traffic. The two cars passing bikes are bunched because they were waiting behind the bikes until the car departing in the background had passed.

As the figures suggest, Dutch suggestion lanes are only used on two-lane roads that are not marked with a centerline, and are too narrow to fit two bike lanes and two travel lanes. The longitudinal markings divide the road into two side zones and a central zone, the latter being wide enough for cars to travel in

one direction, but not wide enough for cars to pass in both directions. They encourage the kind of motorist positioning that takes place naturally on many narrow, low volume roads – motorists ride near the middle of the road by default, and shift to the right when needed to pass oncoming traffic. The side zones become the default bike zone. When cars have to enter a side zone because of oncoming traffic, bikes in the bike zone benefit from the natural yielding that occurs when motorists change lanes. The net effect, then, is to give bicyclists a zone in which they have priority over motor traffic – all by the power of suggestion, using the magic of lines.



Figure 7. Choker reinforcing suggestion lanes in the Westland. The choker reinforces the idea that cars are to drive in the middle, leaving the suggestion lane for bikes, except when they need to shift to the right for oncoming traffic. When the government (as roadway owner) uses marking and devices like this to assert bicyclists’ right to operating space on the road, bicyclists using the lane don’t have to feel assertive. Speed limit is 60 km/h (37.5 mi/h).

National guidelines recommend that suggestion lanes be marked as wide as regular bike lanes, specifically rejecting the practice of making suggestion lanes narrower than regular bike lanes, with the following exception. If the road is narrow, generous suggestion lanes could leave a central zone that is so small that cars overtaking a bicycle will encroach on the *opposite side* bike zone, possibly endangering opposite direction bicyclists. Therefore, guidelines recommend narrower suggestion lanes as the roadway cross section becomes narrower.

Suggestion lanes are used in both urban and rural areas. As part of the national “Sustainable Safety” program adopted in 1997, the default treatment for minor rural roads at least 4.5 m (15 ft) wide is to use suggestion lanes and no centerline, while at the same time lowering the speed limit from 80 km/h (50 mph) to 60 km/h (37.5 mph). On minor rural roads all over the country, centerlines are being removed and suggestion lanes marked. While some officials were skeptical of the safety impact of replacing centerlines with suggestion lane lines, a large scale before-after test involving more than 700 km of rural roads owned by water boards found that this new layout, combined with the speed limit change, reduced the overall accident rate by 17%, while the accident rate involving bicycles had a small but statistically insignificant drop (12).

Informally, any visitor to the Netherlands can readily see how Dutch suggestion lanes meet the three criteria stated earlier for low-stress lane sharing: respected by motorists as a bike zone, sized large

enough that nearly all cyclists stay in them (except when riding two abreast), and used by motorists when it doesn't interfere with cyclists. A before-after study of road user behavior on minor rural roads (13) found that, like formal bike lanes, suggestion lanes have a strong canalizing effect, but only when bicyclists are present. Nearly all bicyclists (97%) rode in the suggestion lanes, whose width varied from 3.7 to 4.3 ft. (In the before case, "in the lane" refers to being in the space that in the after case was defined by the marking.) In the absence of a bicyclist, 61% of motorists drove on or over the suggestion lane marking, down only slightly from before the marking was laid down (69%). However, in the presence of a bicycle, the lines tended to channel the motorists away from the bike zone, but without an undue shift to the left. After suggestion lanes were applied, the fraction of motorists riding in or just next to the bike zone fell from 3% to less than 1%, while the fraction shifting so far to the left that they encroach in the opposite direction bicycle zone fell from 65% to 34%.

In urban areas, within traffic-calmed 30-km/h zones which have proliferated in the Netherlands since 1997 as part of the Sustainable Safety program, it is desired that cars and bikes share space without any lane markings (and therefore no centerlines or suggestion lane markings). However, the desire to provide the highest level of comfort to bicyclists has led to the development of a new street arrangement, borrowed from Germany, called the "bicycle street:" a street intended chiefly for bicycle traffic but on which autos are allowed "as guests." One of the three approved layouts for a bicycle street has the familiar three-zone arrangement, with suggested bicycle zones on the sides indicated by red pavement and a middle zone in black pavement, as shown in Figure 8.

Dutch suggestion lanes meet the criteria that make them a low-stress layout for shared lanes. Their popularity and safety record make them a good model for facilitating lane sharing in a way that is safe, not stressful to cyclists, and clear to motorists. The proposed Bicycle Priority Lane adapts the features of the suggestion lane to create a design that should achieve the same benefits on American streets with centerlines, multiple lanes, and on-street parallel parking.



Figure 8. Bicycle streets in Culemborg (left) and Zwolle. While there is no broken line marking, the pavement colors clearly suggest bike zones on the sides of the road. The narrow central zone in the figure on the left is a visual cue to drive slowly because drivers cannot get out of the bike zone. The sign reads "drive at walking speed."