

## **Memo and Suggestions on Provisions for Bicycles from Lincoln Resident**

To: Ad Hoc Traffic and Roadside Committee

From: Bob Wolf, Meadowbrook Road

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This is an important issue for the safety of cyclists and to avoid conflict between cyclists and drivers.

**What I've done:** I've talked with over a dozen experienced cyclists who know Lincoln's roads well; engaged in email correspondence with MassBike Coalition (David Watson) and its technical advisory committee (John Allen and Richard Williamson); researched RMV's Driver's Manual, esp. Chapter 4 "Rules of the Road", Mass Highway's Project Development and Design Guide, esp. Chapters 3, 4, 5; MassBike's "Go by Bike!" and other guidelines for safe biking.

**What I'm suggesting:** A consistent 2 ft paved shoulder (the paved roadway outside the fog line; I believe this is MassHighway's usage). When vertical obstructions are present, the fog line should be no closer to the obstruction than 3 feet.

Note that this is NOT a bike lane. Rather it is a provision for a shared bike-vehicular space such as Mass Highway's Case 2 in Chapter 5, PDDG.

**Why a 2 foot shoulder makes sense:** According to Mass Highway (and other sources) bikes require about 40" of operating width, 48" when they are pulling a child or cargo trailer. Cars and light trucks can require up to 9' of operating width (these numbers are from a very big SUV or full sized pickup; could be somewhat smaller for more traditional cars). Large trucks and buses can require 10'.

Safety also suggests a buffer between vehicles when a faster vehicle overtakes a slower one, e.g. a car at 35mph and a bike at 15 mph. The state of MA does not specify this buffer or specific minimum passing though some cities and towns in MA and other New England states require overtaking vehicles to give bikes a minimum of 3' of clearance. I will leave it to the engineers to determine the exact consequences, but practically a buffer might add a foot or so to needed distances.

Given a "typical" road width of 24', a 2' shoulder and 10' travel lane can provide a relatively safe balance of traffic needs for both uses. If a cyclist rides on the fog line when road conditions are good and the shoulder is clear and maintained, the 2' shoulder allows roughly for half the bike's 40"-48" needed operating width, the vehicular lane, 9' of big SUV or pickup, plus a foot, without having the overtaking car ride too far into the oncoming lane of traffic (a foot or less for most vehicles).

This solution is not perfect. Mass Highway recommends a minimum of 4' for the shoulder with wider specifications for obstructions, high traffic, or high speeds. Then no vehicle ever has to cross the double yellow line. And the fog line is a demarcation of travel spaces for bikes and cars. Everyone is in a separated demarcated space. The compromise approach I'm suggesting

will require patience and accommodation from both drivers and cyclists. And likely some kind of information sharing or education on the part of the town.

But within the constraints of our existing roads and right of ways, it may be the best we can do at this time. Adoption of a uniform 10' lane on all of Lincoln's primary roads, will signal to drivers a need to be careful and understand their duty under state law to share the pavement with bicycles. A maintained 2' shoulder can give cyclists a confidence that there is a relatively safe pathway for them, too. That said, both drivers and cyclists will have responsibilities to take account of the existence and behavior of one another.

**When safety concerns may require exceptions:** Vertical obstructions create a cycling hazard that may be especially of concern to the inexperienced rider and require extra clearance to create an environment that feels safe. These obstructions include guard rails, bollards, vertical curbing, trees, mail boxes, and utility poles.

This phenomenon and its psychology have been confirmed in multiple studies, several of which are cited in Mass Highway's PDDG. The practical consequence is to ensure that the obstruction is outside of the needed operating width of the cyclist, i.e., the obstruction should be at least 3' from the fog line.

Note that this does not imply that the paved shoulder be widened to 3' or more. It does mean, having located the fog line, that mailboxes, fencing, poles, etc closer to the fog line than 3' and falling within the road taking, be moved wherever feasible.

**Consistency matters a lot:**

The differences between cars/trucks and bikes in travel speeds imply that consistent application of a shoulder policy needs to be maintained. Cyclists are counseled to ride in a consistent manner in the presence of traffic (e.g., see MassBike's "Go by Bike!"). Therefore, frequent interruption of a 2' shoulder forces the cyclist to either weave in and out as the shoulder varies or, following the consistency rule, to ignore the 2' shoulder when they occur and ride well into the main vehicular travel lane to account for the bike's needed operating width.

**What you might do when consistent application is not possible:** When "neck-downs" of the road surface must occur and the shoulder is reduced below 2', say at intersections without adequate right of way or in the presence of obstacles that cannot be moved, signage could be used to signal road hazards or limitations. I'd be specific and say something that signals what the driver or cyclist needs to know, e.g. "pavement narrows".

This may be an opportunity to get rid of some of the useless signage in town. For example, both east- and westbound on 117 near Lincoln Road, there are "dangerous intersection" signs. The record shows that this is true, at least relative to other Lincoln intersections. But it's not a very useful description for decision making by the traffic. Perhaps a thought exercise to take all the signs down (just mentally), then reintroduce those that are needed with specific information that traffic needs.

**Maintain the road:** A key point that needs to be emphasized from day one after reconstruction. If cracks are not filled and are allowed to grow, if patching is done in a manner that yields unbikable road surface, or if ground cover is allowed to usurp the shoulder, much of the good work done at this stage will be for naught.

**Specify and educate public on safe "rules of the road":** I'd urge the Selectmen to continue deliberations on traffic after this phase of primary road rebuilding. Specifically, I think it would be a good idea to consider an explicit passing clearance for motor vehicles overtaking bicycles. Something like the 3' I mentioned above. That would give police a specific guideline to educate the public to and ultimately enforce.