

Bicycle Safety Program

Executive Summary

In November 2009, the Board of Selectmen asked ABAC, TAC and the Police to develop a bicycle safety program. Investigation of Arlington Police crash statistics reveal that in a typical year there might be 10 – 20 motor vehicle – bike crashes (about 2% of all motor vehicle crashes), and perhaps 4 other incidents (falls, bike-bike, bike-pedestrian collisions) that are investigated by the police. Although Arlington Center does not appear to have an exceptionally large number of bike crashes, sidewalk riding due to the Bikeway crossing there has resulted in numerous citizen complaints.

At their February 2010 meetings, both ABAC and TAC endorsed the following recommendations:

- 1) Pay attention to road maintenance. National statistics indicate that many cyclist injuries are due to falls, not reported to the police. For a cyclist, a pothole can result in serious injury.
- 2) Consider the needs of cyclists in all new road design. Good design provides cyclists with an alternative to sidewalk riding.
- 3) A phased approach to re-engineering Arlington Center is appropriate
 - a) Shared lane arrows and other markings on the road to show where cyclists should ride on the road. In coordination with the Central Transportation Planning Staff, investigate the feasibility of coordinating the Mass/Mystic and Mass/Medford signals to create gaps for westbound left turns from Swan Place.
 - b) Thoroughly investigate the feasibility, cost and issues with the other approaches (diagonal crossing, cycle track on the north or south side of Mass Ave, following the original rail alignment, bike lanes on the streets).
- 4) Educate motorists on sharing the road, and cyclists on safe riding practices. This can be done via outreach in the schools (starting in 4th grade), adult classes, educational brochures and enforcement efforts that initially focus on education. The draft brochure that is attached to this memo contains the key violations by both cyclists and motorists that should be the focus of an education/enforcement effort.
- 5) In Arlington Center, once the shared lane arrows are in place on the road, ensure the prohibition on sidewalk riding is clearly posted.
- 6) Ensure that police officers are educated on safe bicycling practice, as well as the behaviors by both cyclists and motorists that cause crashes.
- 7) Explore opportunities to integrate enforcement with community policing and traffic enforcement efforts. Use a phased approach, starting with education, leading to warnings and then citations.
- 8) Do nothing to discourage bicycling. Bicycle and pedestrian crash rates tend to be lower where there are more cyclists and pedestrians.

The next pages describe the engineering, education, enforcement and encouragement parts of this program, with a particular focus on Arlington Center.

Engineering

A fundamental principal in the engineering of streets is that right design invites right use. If a road design fails to consider a particular group of users (such as bicyclists), then those users will be forced to improvise, often perceiving that it is necessary to break the rules in order to be safe. From an engineering standpoint, the problems with sidewalk riding in Arlington Center stem from both a failure to adequately consider the needs of bicyclists in this area when the Minuteman Bikeway was built (a bikeway that is, in other respects, very well designed), and the failure to consider cyclists when the roads in Arlington Center were reconfigured, well over 20 years ago.

Fortunately, the Metropolitan Area Planning Council has launched a Clean Air and Mobility Program (CLAMP), intended, among other things to, “serve as a funding source for implementing small-scale roadway, intersection, bicycle, and pedestrian facilities that are recommended in MPO evaluations and studies.” Recently, the MPO has reviewed the Arlington Center intersection and has made a number of recommendations aimed at improving motorist, bicycle and pedestrian safety and mobility. The short term options presented here draw from these recommendations, and the Town is seeking funding through the CLAMP program to implement them. Planned improvements for motorists, cyclists and pedestrians in Arlington Center include the following:

1. After obtaining up-to-date traffic data, adjust the timing at the Mass Ave / Route 60 signal. Based on older data, it appears that the Mass Ave left turn phase should be lengthened from 12 to 16 seconds, including a 1-second longer all-red clearance interval. This is intended to reduce red-light running by motorists and the subsequent conflicts with pedestrians.
2. Install count-down signals for pedestrians at this intersection. This was voted by the Board of Selectmen as part of the Winslow Tower recommendations in December 2009.
3. Extend the following left-turn lanes, to reduce blockages of the thru lane by left-turning motorists
 - On Mystic Street by approximately 100', so that it would start just south of Winslow Street (the existing median at Winslow would be retained, but the median would be narrowed between Winslow and Mass Ave.).
 - On Mass Ave westbound by approximately 60', so that it would start just west of Swan Place. (the existing median at Winslow would be retained, but the median would be narrowed between Winslow and Mass Ave.)
 - On Pleasant Street (done via restriping)

Figure 9C-9. Shared Lane Marking

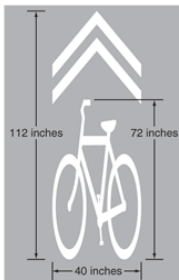


Figure 1 Shared Lane Marking

4. Provide shared lane markings (Fig 1, taken from Figure 9C-9 in the 2009 Manual on Uniform Traffic Control Devices, or MUTCD) on Mass Ave between Swan Place and Water St. This is intended to communicate to both cyclists and motorists the correct place for cyclists to ride on the street, and to reduce instances of thru-cyclists using the right turn lane.
5. Provide clear markings and signs to prohibit sidewalk riding, while indicating that walking bikes on the sidewalk is permitted.
6. Provide appropriate directional signage, directing cyclists who wish to ride away from the sidewalks.

7. Construct an 8' wide path for bicycles near the Uncle Sam statue between the corner of Mass / Mystic and the bikeway. This provides a key connection for eastbound bicycle traffic from the bikeway to Mass Ave, a connection that avoids an extremely difficult left turn from Water Street.

Figure 2, illustrates the short term engineering improvements

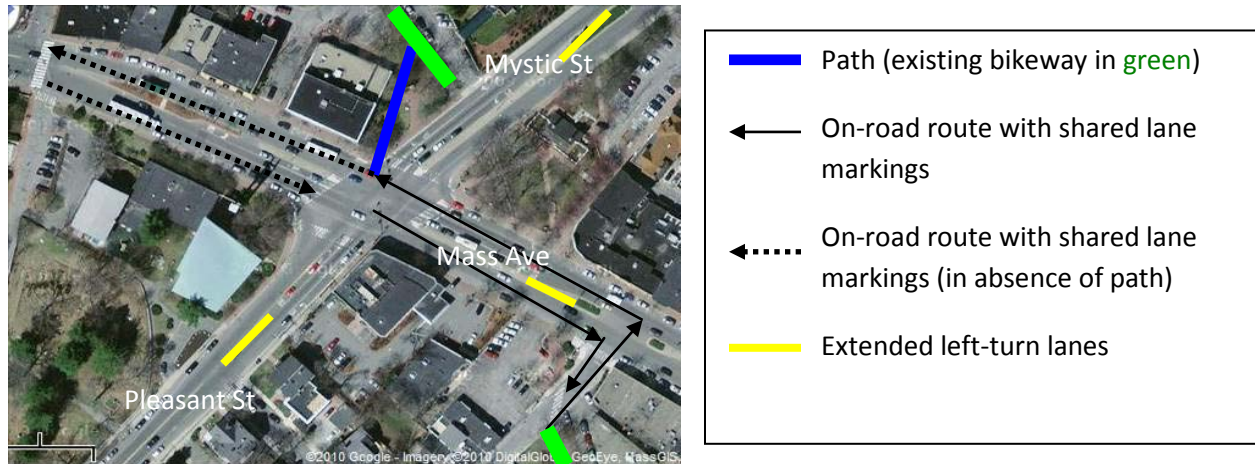


Figure 2 Short Term Approach

Arlington Center: Longer Term Engineering Options

The two leading long-term options under consideration include a cycle-track along the south side of Mass Ave, or routing cyclists along the original rail alignment. Both provide separate paths for bicycles and pedestrians. The long term options would require additional consultation with interested Town committees and the public before implementation.

The cycle-track (Figure 3) includes the following:

- An 8' path (sufficient for two-way bicycle travel) near the Uncle Sam statue between the bikeway and the NW corner of Mass Ave and Rt 60
- Bicycle signal at the Mass Ave / Rt 60 intersection that runs concurrently with left turns from Rt 60
- A two-way cycle track in the parking lane of Mass Ave between Route 60 and Swan Place.

The advantages of this approach are that (1) it can be tried extremely cheaply, with signs and cones/bollards along the parking lane, (2) it makes efficient use of the existing signal at Mass Ave / Route 60, without the need to add signals, (3) it is close to the route that many path users have chosen already, a choice that has produced a reasonably good safety record, and (4) moving cyclists away from the building faces (Cambridge Savings) will improve motorist/cyclist visibility. Disadvantages include (1) the unconventional diagonal crossing for Mass Ave/ Route 60 and (2) potential conflicts with motorists at the two driveways (the Bank and JamNJava), and (3) the loss of a few on-street parking spaces.

The original rail alignment (Figure 4) involves routing the bike path along the original rail alignment by the Jefferson Cutter House. It would involve two new signals: one on Mystic Street and the other on Mass Ave near Swan Place. Its advantage is an extremely direct routing. This option is expensive; furthermore, any new signals would have to be closely synchronized with the existing signal at Mass / Rt 60, in order to avoid adding to motorist or cyclist delay.



Figure 3 Cycle Track



Figure 4 Original Alignment

Education

Education is an extremely important part of any bicycle safety program, because some individuals have strongly-held opinions about bicycling that are contrary to both the law and safe bicycling practice. The law says that cyclists may use the road as drivers of vehicles, with the same rights and responsibilities as motorists. Experienced bicyclists have found that the only way to safely ride at faster than walking speed is to act as a driver of a vehicle, using the roads as a vehicular bicyclist.

However, some believe that cyclists should “keep out of traffic” and act like pedestrians. As a result, many bicyclists do act like pedestrians, for example, by riding on sidewalks. When they are on the road, they put themselves and others in danger by riding too far to the right (in range of opening car doors, or trying to go straight in the right-turn only lane), and by ignoring signs, signals and markings.

General recommendations are as follows:

1. Take advantage of opportunities to educate both children and adults on safe and lawful bicycling.
 - a. In the past, the Town has provided space for Massbike-sponsored bicycling education classes; this should continue.
 - b. At the 4th and 5th grades (an age when children are capable of learning basic vehicular bicycling skills) provide bicycling education. Where road conditions permit, provide opportunities for parents and children to ride to school. Reinforce the message at higher grade levels.
2. Provide a brochure on safe bicycling practices, with material tailored to Arlington (a draft is attached as part of this report).

3. Identify teachable moments in the BikeArlington tour, and use them¹. This tour is an annual family-oriented ride around Arlington, sponsored by ABAC with a Police escort. Depending on weather, it typically attracts between 20 and 60 participants.

Specific recommendations for Arlington Center were mentioned previously in the engineering section of this report, and include shared lane markings and a clearly indicated prohibition on sidewalk riding. It should be noted that in the absence of substantial engineering improvements in Arlington Center, it may be difficult to achieve voluntary compliance with the prohibition on sidewalk riding.

Enforcement

The Bicycle Safety Bill that was passed by the state legislature in April 2009 made the procedure for ticketing cyclists similar to that for motorists. However, enforcement cannot occur in a vacuum. Any enforcement (such as sidewalk-riding enforcement) that might result in more cyclists using the road must be accompanied by the appropriate education of those cyclists and engineering accommodation on the road. Otherwise, the enforcement may create a more dangerous situation than what exists now. Also, given the number of injuries to cyclists caused by motorist violations, any enforcement effort should be directed at the unlawful, dangerous behaviors of both bicyclists and motorists.

Specific recommendations include the following:

1. Explore opportunities for bicycle/pedestrian safety grants to fund such any enforcement effort. It should be noted that in the absence of such resources, the Police Department has indicated that they would be unable to support an enforcement effort.
2. Ensure that police officers understand both the law and the types of dangerous behaviors by both cyclists and motorists that they should be looking for. Massbike has developed a national program which contains extremely useful material².
3. Explore opportunities to integrate this enforcement with other enforcement and community policing. For example, sidewalk enforcement might be part of foot patrols in our business districts. A crosswalk enforcement effort on Mass Ave might involve pulling over both motorists and cyclists who fail to yield to pedestrians in crosswalks.
4. A phased approach for bicycle enforcement should be used. Start with a primarily educational approach: a verbal warning (this is why you were stopped) accompanied by a brochure. As needed, escalate to written warnings (take names) and finally citations.

¹ For example, should the tour use the sidewalk in Arlington Center, make sure everyone walks on the sidewalk.

² See <http://www.massbike.org/projectsnew/law-officer-training/>

Encouragement

The past few years have seen a noticeable increase in bicycling. In general, this has been a good thing. Each bicycle that replaces a car helps to reduce traffic and parking congestion. The increase is also consistent with the Town's desire to be more "green." At a national level, a shift away from automobile use for short trips reduces carbon emissions and our Nation's dependence on foreign oil.

Furthermore, there is evidence that more bicycling means safer bicycling, as bicyclists learn from each other, and motorists learn how to share the road safely. In communities with more bicycling and walking, the bicycle and pedestrian crash rates tend to be lower³. Therefore, a bicycle safety program should avoid actions that discourage bicycling.

However, the behavior of some bicyclists is dangerous to both themselves and others. They, and others will benefit from education (and, as needed, enforcement), on safe and legal riding. Those cyclists who do ride safely and legally have a more enjoyable experience, and are thus more likely to continue cycling for the long term. They receive more respect from other road users, and have fewer close calls and crashes.

³ See <http://www.livablestreets.com/streetswiki/safety-in-numbers> for a non-technical explanation. The original paper is Jacobsen, P. 2003. [Safety in numbers: more walkers and bicyclists, safer walking and bicycling](#) (pdf). *Injury Prevention*, 9:205-209.

Sharing the Road Safely:

Advice for Bicyclists & Motorists

According to Massachusetts Law, bicyclists have the same rights and duties as the drivers of motor vehicles (MGL Ch 85 11b). Every Arlington street is open to bicyclists.

Of the approximately 800 motor vehicle crashes in Arlington each year, between 10 and 20 involve bicycles. Here is how you can avoid being involved in one of those crashes.

Produced by:

Board of Selectmen

Police Department

Bicycle Advisory Committee

Transportation Advisory Committee

Town of Arlington, Massachusetts

Advice for Cyclists

Some motorists and cyclists ignore the rules. Don't follow their example. Riding by the same set of rules as motorists greatly reduces your risk of a crash. Those cyclists who obey the rules also tend to receive more respect from motorists.

- Ride on the right side of the street, with the flow of traffic. Do not go the wrong way down a one-way street. Wrong-way riding is the largest cause of collisions with cars.
- Do not ride on the sidewalk.
- Obey signs, signals¹ and lane markings. For example, when proceeding straight on Mass Ave in Arlington Center, use the thru lane, not the right turn lane.
- Yield to pedestrians in crosswalks, and do not pass any other vehicle (car or bike) that has stopped for a pedestrian in a crosswalk.
- Use a white front light and the appropriate rear reflectors when riding at night. A red rear light is also recommended.
- If you are 16 or younger, you must wear a bicycle helmet. For all cyclists, wearing a properly fitted helmet reduces the risk of fatal and disabling brain injuries in a crash.
- Ride at least a car-door length away from parked cars.
- When there is space, and you can do so without compromising your safety, leave enough room for faster traffic to pass you on the left.

¹ Exception: if you are at a traffic-actuated signal, your bike does not trip the detector, and there is no car around to trip the detector, you may treat it as a motorist would treat a non-functioning traffic signal. Proceed extremely cautiously, yielding to all other traffic.

Advice for Motorists

Respect for other road users, including pedestrians and cyclists, goes a long way towards preventing crashes.

- When turning right, slow and merge behind a cyclist ahead of you to make your turn from the right edge of the road. It is illegal to turn right immediately in front of a cyclist. (MGL Ch 90 14).
- When turning left, check carefully for, and yield to, oncoming cyclists, even those on the far side of the road. Do not underestimate the speed of a cyclist. (MGL Ch 90 14).
- When getting out of a car, do not open your car door into the path of an approaching cyclist (MGL Ch 90 14).
- When overtaking a cyclist, pass at a safe speed, leave plenty of room, and don't pull back to the right until you are well clear of the cyclist.

Bicyclists may occupy any part of a traffic lane when their safety warrants it. If the lane is too narrow to share (for example, Mass Ave in Arlington Center when parked cars are present), it is safer for the cyclist to communicate that information by riding in the center of the lane.

Acknowledgements

Much of the material in this brochure is taken from the Boston Transportation Department's "Don't be a Road Hog/Warrior" brochure, and from Massbike's educational materials (www.massbike.org).

What Should Bikeway Cyclists Do in Arlington Center?

The Minuteman Bikeway crossing in Arlington Center is a uniquely complicated problem. This pamphlet is an early result of the Town's committees and departments to address these issues. Until more permanent changes can be made, your cooperation with the guidelines below will help reduce conflicts.

Why the Sidewalk is not a Safe Place to Ride

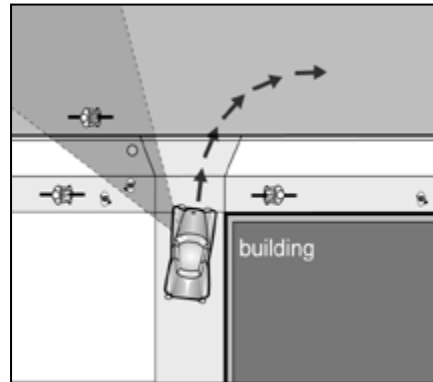
Cyclists and pedestrians can share the Minuteman Bikeway because there are few points where someone can enter unexpectedly, visibility is generally good, and both cyclists and pedestrians expect to share the trail.

Some cyclists treat the sidewalks in Arlington Center as a continuation of the Minuteman Bikeway, and ride on them. However, it is both dangerous and illegal (in Arlington) to ride on the sidewalk in a business district, such as Arlington Center because:

- A pedestrian can suddenly appear from any storefront, or can suddenly turn towards a storefront, or toward the street to his or her parked car.
- Pedestrians and motorists don't expect to see cyclists on the sidewalk in a business district.

A business district sidewalk also has driveways (for example, the exit from Cambridge Savings Bank). Cyclists who ride on the sidewalk (or the wrong way on the street) are also at greater risk from collisions with motorists.

Although motorists should be checking for traffic on the street, they don't look for anyone coming faster than a pedestrian on the sidewalk. In the illustration below, the only cyclist that this motorist has seen is the one on the street.



What are the Options?



Walk on the Sidewalk

A person walking a bike is considered a pedestrian and is expected to obey pedestrian laws. This is the best option for families with small children, and those cyclists who are not accustomed to sharing the road with heavy auto traffic. Walking your bike on the sidewalk gives you the important legal protections that pedestrians receive, including the right-of-way when crossing driveways.

It takes less than 5 minutes (700 feet) to walk from the Bikeway at Mystic Street to the Bikeway at Swan Place.



or Ride on the Street

For more street-savvy bicyclists, there are several riding routes through Arlington Center. They require that you use the travel lane, shared with motorists.

Eastbound, there are several options. The first two can be difficult in heavy traffic:

- Turn right at Water Street, left onto Mass Ave, and proceed straight to Swan Place
- At Mystic Street turn right (using the nearby curb cut), cross over to the left turn lane, and use the left turn signal to turn left onto Mass Ave, and then proceed straight to Swan Place.
- At Mystic Street, walk to the corner of Mass Ave, cross the street, and re-enter the traffic stream on Mass Ave eastbound with the light.

Westbound bicyclists are advised to turn right off of the Bikeway onto Swan Place, and then turn left onto west-bound Mass Ave.

