

Woburn Safe Routes to School

Walkability Assessments



MAKING MASSACHUSETTS MORE WALKABLE

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Introduction

During the summer of 2012, WalkBoston completed five walkability assessments of the pedestrian environments around five of Woburn's public schools. Walkability assessments are commonly used in the vicinity of schools to identify problems with the pedestrian infrastructure. These problems often include discontinuous sidewalk networks, unsafe street crossings, damaged sidewalks and paths, unreliable pedestrian signals, and maintenance issues, such as crosswalks that need repainting or vegetation that has encroached on the pedestrian right of way. When a community wants to encourage more walking and biking to school, it is important that there are safe ways to do so.

This report highlights the observations that were made and makes recommendations on how to improve walking safety, especially for children walking to and from school. Many of the observations are related to vehicular speed, visibility for both pedestrians and drivers, and also predictability and consistency. While lower-cost solutions are emphasized, some longer-term more costly investments are also suggested.

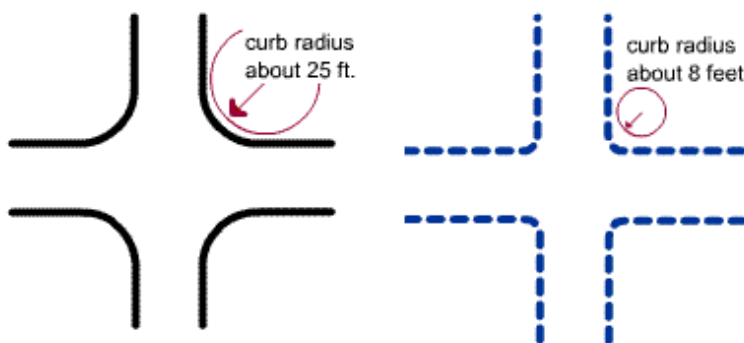
Below are images that will clarify some of the terminology used in the report.



A painted curb extension with planters and flexible delineators (white posts)



In-street pedestrian crossing sign



Larger curb radius (left) allows vehicles to turn more quickly and creates longer crossing distance for pedestrians. Smaller curb radius (right) slows turning speeds and provides pedestrians shorter crossing distances.



The parallel lines (left) are adequate for low-traffic areas, while the ladder (right) is more visible and should be used in higher-traffic areas.

Shamrock Elementary School

Shamrock Elementary School is located in a mostly residential neighborhood southeast of Downtown Woburn. It fronts Green Street, a 1 mile-long east-west collector road that connects two of Woburn's busiest streets, Montvale Avenue and Main Street (MA Route 38). The school's main access point for vehicles and pedestrians is on Green Street, with a rear entrance on Eastern Avenue and a pedestrians-only entrance that connects the school grounds to a cluster of Woburn Housing Authority homes on Spring Court Extension.

1. Crosswalks in front of Shamrock school grounds

a. On the north side of Green Street, a pedestrian crossing sign is placed several feet west of the crosswalk by the western entrance to the parking lot. (See Figure 1)

Recommendations: The sign should be placed farther east on Green Street in advance of the crosswalk. This crosswalk, currently two parallel lines, should be improved to a ladder crosswalk. Ladder crosswalks are more visible especially at night or in low light conditions, such as rain or fog.

b. On the south side of Green Street, a pedestrian crossing sign exists in advance of the eastern entrance to the school. Currently there are no crosswalks at this entrance.

Recommendations: Add an accessible crosswalk, with curb ramps and pedestrian crossing signage to the east of the entrance so pedestrians are not forced to cross over the school driveway to access the sidewalk that runs along the east side of the driveway.

2. Sidewalk along Shamrock school grounds

The sidewalk on the north side of Green Street has a wide curb cut that serves no purpose. (See Figure 2)

Recommendations: The curb cut should be removed, and sidewalk should be improved to be a continuous, level walking surface with a full curb along the street.

3. Green and Garfield

The southeastern corner of Green Street and Garfield Street is missing a curb ramp. All other corners have been improved with accessible ramps, except this one.

Recommendations: Build an accessible curb ramp.

4. Path at rear entrance to school grounds

The path that connects the housing development east of the Shamrock school grounds abruptly ends, forcing pedestrians using this access point to walk through grass and dirt. This would be especially challenging during inclement weather, or for anyone with a mobility impairment. (See Figure 4)

Recommendations: Continue the path another ~15 feet to where it would meet the paved path that connects the school's rear driveway with the front of the school. Cut the vegetation back from the edges of the path, to make it easier to pass through the narrow opening in the fence.



Figure 1



Figure 2

White Elementary School (and Woburn High School)

White Elementary School is located in a mostly residential neighborhood adjacent to Woburn High School and east of Downtown Woburn. It fronts Bow Street, a .4 mile-long north-south local road that connects Montvale Avenue and Salem Street. The main pedestrian and vehicular access point is on Bow Street, with a rear pedestrians only entrance that connects to a driveway that services the tennis courts and playing fields east of Woburn High School.

1. Sidewalk along Boline Street

The sidewalk along Boline Street comes to an abrupt end approximately 150 feet before it intersects with Montvale Avenue. Parked vehicles and overgrown vegetation make this a difficult area to walk, especially because it is an uphill walk to Montvale Avenue from Boline Street. (See Figure 3)

Recommendations: Extend the sidewalk from Montvale Avenue to where the sidewalk ends on Boline Street.



Figure 3

2. Bow Street in front of school grounds

a. The school zone sign on Bow Street is a standard flashing 20 MPH sign that only flashes during school hours.

Recommendations: Consider installing a radar speed limit sign (also known as a “driver feedback sign”). Other Woburn schools (Shamrock and Wyman) have them.

3. Crosswalks on Side Streets

Some of the side streets off of Bow Street, Montvale Avenue and Salem Street lack crosswalks. There should be greater consistency.

Recommendations: At any intersection where there are curb ramps, there should also be two parallel lines at minimum. Ladder-style crosswalks would be even better, especially in a school zone, as they make it clearer that pedestrians are using the streets.

4. Intersection of Beach and Salem

The crosswalk at Beach Street and Salem Street was recently repainted and realigned so that it connects the two new accessible curb ramps. This has shortened the crossing distance, but the view of oncoming traffic from the new location of the ramp on the north side of Salem Street is somewhat obstructed due to a curve in the road. Vehicles sometimes park on Salem Street, which further obstructs visibility at this location.

Recommendations: The curb should be extended so that pedestrians who seek to cross Beach Street east to west may see traffic and be seen by drivers. This could be done by painting a curb extension and installing flexible delineators. At very least, placing a (moveable) in-road “Yield to Pedestrians” sign here would serve as a reminder to expect crossing pedestrians,



Figure 4

and could help to slow traffic turning towards Beach Street from Salem Street.

5. Long continuous curb cut

The gas station on Salem Street east of Bow Street has one long continuous curb cut, which runs the length of the entire property. This design allows vehicles to enter or exit the gas station at any point, which can create a precarious situation for pedestrians walking along Salem Street.

Recommendations: Ideally the gas station would have just two smaller curb cuts to limit access to specific locations. At the very least, the street/sidewalk edge should be better defined, perhaps with a pair of bold white parallel lines, so that the pedestrian right of way is maintained.

6. Salem Street and Hilltop Terrace

The sidewalk on the south side of Salem Street effectively ends after Hilltop Terrace: there is no ramp, the sidewalk becomes very narrow, and it is partially covered in rocks, dirt and other debris (perhaps because it's unused). (See Figure 5)

Recommendations: A long-term/larger-investment improvement would be to re-establish the sidewalk and to maintain a clear walking path. A short-term/smaller-investment improvement would be to improve the crosswalk at the intersection of Salem Street, Hilltop Terrace and Sedgwick because it's necessary to cross here if walking east on Salem.

7. Salem Street utility pole and bushes

There is a utility pole installed in the sidewalk of the north side of Salem Street between Beach Street and Bow Street, which is directly next to a wall of overgrown hedges. This arrangement makes the sidewalk barely passable and causes pedestrians to step into the roadway to pass by. (See Figure 6)

Recommendations: Trim back vegetation that blocks sidewalks. Where appropriate, add asphalt (See Figure 7) to the inside edge of the sidewalks (this may not be possible because of stones and fences).

8. High School tennis court driveway

The driveway that leads to the tennis courts beside Woburn High School has two major issues (See Figure 8):

a. Halfway down the driveway there are two adjacent accessible curb ramps that have not been connected with a marked crosswalk.

Recommendations: Mark a crosswalk that connects the two ramps. While this driveway may only serve limited traffic, the existence of a crosswalk serves as a reminder to drivers that pedestrians may be present here.

b. The driveway's traffic pattern may confuse motorists as well as pedestrians. It is marked as a one way, but arrows pointing in the opposite direction of the sign are painted on the roadway. This makes it difficult to determine who has right of way.

Recommendations: Determine whether this needs to be a one-way driveway, and install the appropriate signage and



Figure 5



Figure 6



Figure 7

pavement markings based on the outcome of that decision. If it should become a two-way, remove the one-way markings.

9. Crosswalk leads to driveway instead of ramp

There is a curb ramp directly across Campbell Street from the ramp at the end of the path across the grassy area, yet the crosswalk leads to a driveway instead. (See Figure 9)

Recommendations: Re-align the crosswalk so that it connects two curb ramps, not a curb ramp and a driveway.

10. Crosswalk into High School driveway

An awkwardly-placed crosswalk near Woburn High School's main entrance directs pedestrians crossing Montvale Avenue directly into the center of the high school driveway. This would be far from the safest place to cross, given the amount of traffic one can expect to use the school's main driveway. There are no curb ramps on the south side of Montvale Avenue across from the High School. (See Figure 10)

Recommendations: Install an accessible curb ramp at the east side of the school driveway, which has a generous sidewalk that leads to the main entrance of the school, and directly across from the east side of the high school driveway. Move the crosswalk so that it connects the two curb ramps. Because Montvale Avenue accommodates heavy traffic, a radar speed limit sign (driver feedback sign) would help reduce speeds near Woburn High not only during school hours but at all times of day. The added benefit to doing so might also help calm traffic speeds as vehicles approach Downtown Woburn.



Figure 8



Figure 9

Kennedy Middle School

Kennedy Middle School is located in a mostly residential neighborhood west of the Wildwood Avenue industrial area and northeast of Downtown Woburn. It fronts Middle Street, a .7 mile-long local road that runs parallel to Mishawum Road, a busy north south collector road. The main vehicular and pedestrian access point is on Middle Street, with an auxiliary entrance for vehicles and pedestrians at the end of Maywood Terrace behind the school. There appears to be an informal pedestrian path through a wooded area that connects the school grounds to Overlook Avenue, a cul-de-sac that ends east of the school grounds.

1. Middle Street in front of school

The crosswalks in front of Kennedy Middle School that cross Middle Street lead directly into solid curbs with no curb ramps. (See Figure 11)

Recommendations: Add curb ramps.



Figure 10

2. Middle Street has excess width

Middle Street has 14.5 feet wide travel lanes that encourage high vehicle speeds, regardless of the posted speed limit. Narrower lanes can help to slow traffic.

Recommendations: Stripe a white fog line painted 4 feet in from the curb. This would narrow the travel lanes to 10.5 feet and create a wide shoulder comfortable for bicycling. (In order to stripe an “official” bike lane, it would need to be 5 feet wide because there is a vertical curb at the edge of the roadway).

3. Middle Street Sidewalk

West of the school grounds, there is vegetation encroaching on the sidewalk and “SCHOOL ZONE” signage along Middle Street. Because this is only sidewalk (just on the south side of Middle Street) it should be maintained as well as possible. (See Figure 12)

Recommendations: Trim back the brush and tree branches along Middle Street so that the sidewalks are passable and the signage is visible.

4. Clinton and Mishawum

a. Traffic signal posts are installed where ideally curb ramps would be, and their placement in the middle of narrow sidewalks makes these points difficult to pass. (See Figure 13)

Recommendations: The geometry of this intersection would make widening sidewalks difficult. Instead, signal posts could be removed from the sidewalks and traffic signals could possibly be suspended over center of intersection. The base of such a suspension system might be installed wherever there is the greatest surface area on an existing sidewalk or set into land outside the sidewalk if the right of way is available to avoid blocking the sidewalk as it is currently.

b. There is no crosswalk marked across Clinton Street where it meets Mishawum on the western leg of the intersection (though there once was, according to Google Street View).

Recommendations: Marked crosswalks with accessible curb ramps are needed at all legs of this intersection, and especially at this location because the sidewalk along the north side of Clinton Street ends directly west of the intersection.

5. Beach Street Utility Poles

Utility Poles are in the center of the sidewalk all along Beach Street headed toward Salem Street from Mishawum Road.

Recommendations: Sidewalk should be “widened” at these locations by adding asphalt on the inside of the sidewalk (away from traffic) wherever possible. This has been done elsewhere in Woburn and in many other communities. This makes the sidewalk’s effective width wide enough for a wheelchair to pass (a minimum of 36 inches, according to the Americans With Disabilities Act guidelines).



Figure 11



Figure 12



Figure 13

6. Crosswalk at Anthony and Beach

The crosswalk that crosses Beach Street at Anthony Drive is missing curb ramps. Also, Anthony Drive, which is rather wide where it meets Beach St, is missing a crosswalk marked by two parallel lines that many side streets in Woburn have. This is not uncommon. Many “T” intersections where local residential streets meet more heavily traveled roads lack crosswalks that would naturally continue the pedestrian right of way across the side street.

Recommendations: Where crosswalks are missing at any “T” intersection, stripe at minimum a pair of parallel white lines. Doing so would not only make all of Woburn’s intersections consistent; the crosswalks would remind drivers to slow to a stop before the crosswalk, check for vehicles as well as pedestrians, and then “nose out” into the intersection.

7. Sloped Sidewalk near Maywood Terrace and Beach Street

Just east of the intersection of Maywood and Beach, across from the cemetery, the sidewalk on the north side of Beach Street adjacent to the stone wall is severely sloped. This sidewalk would be especially difficult to use in winter. (See Figure 14)

Recommendations: The sloped portion of the sidewalk should be leveled and reconstructed.

8. Maple and Lillian STOP sign height

The stop sign on the northwest leg of the 4-way intersection at Maple Avenue and Lillian Street is too low. According to the Manual of Uniform Traffic Control Devices (MUTCD), the bottom of a sign mounted where pedestrians can be expected should be no lower than 7 feet. (See Figure 15)

Recommendations: Raise the sign so that it complies with the MUTCD.

9. Path behind school

The neighborhood east of Kennedy Middle School, which is connected to Beach Street by Maple Street, is close to the rear of school “as the crow flies,” but it is a long walk because of the lack of street connectivity. (See Figure 16)

Recommendations: An informal path through the wooded area between Overlook Terrace at the western edge of the aforementioned neighborhood should be cleared, improved, and perhaps lighted. This would provide a safe connection to the school grounds that would be much shorter for people trying to walk or bike to Kennedy Middle School, and increases the likelihood that children from this neighborhood would choose to walk or bike to school.

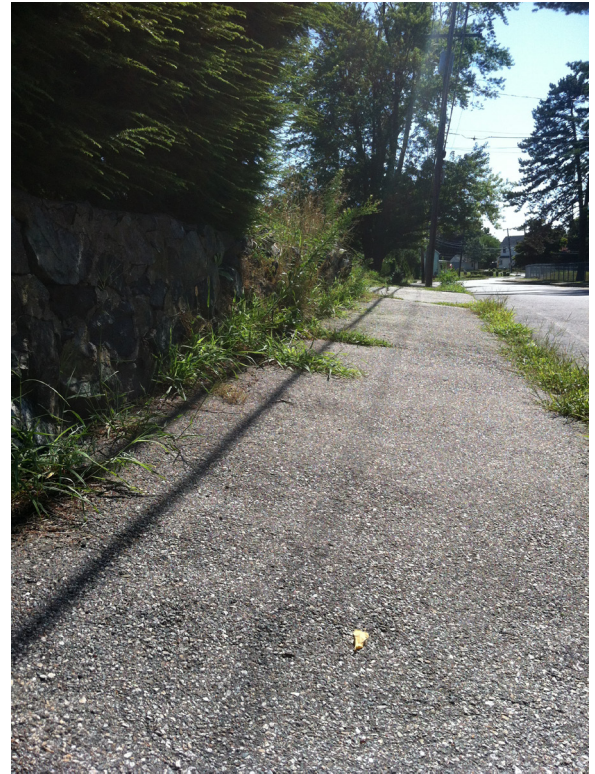


Figure 14



Figure 15

Hurld Elementary School

Hurld Elementary School is located in a residential neighborhood northwest of Downtown Woburn near the Burlington town line. Hurld is the only school that is located west of Main Street (MA Route 38). It fronts Bedford Road, a 2.5 mile-long collector road that runs west from central Woburn to the commercial area near Burlington Mall. The school's main access point for both pedestrians and vehicular traffic is on Bedford Road, with an auxiliary entrance for pedestrians and cyclists from a path that connects to Sheridan Street, a local road that runs parallel to Bedford Road north of the school grounds.

1. Crosswalk in front of school

The crosswalk at Houghton Street and Bedford Road provides less than optimal visibility for pedestrians crossing Bedford Road, especially those crossing toward the Hurld School. Bedford Road bends slightly, to the west of the crosswalk, so pedestrians would be unable to predict if a vehicle were approaching from their left. The problem is made worse by tall hedges at the edge of one of the properties on the south side of Bedford Road. This crosswalk is also missing a curb ramp on the north side of Bedford Road. (See Figure 17)

Recommendations: Remove this crosswalk and place a new crosswalk to the east where pedestrians would have better visibility and a more direct connection to the school grounds. This new crosswalk should be a highly visible ladder style, not simply a pair of parallel white lines. Accessible ramps should also be installed, as well as brightly-colored pedestrian crossing signage. This would be the only crosswalk in the school zone, so it should be made as visible as possible.

Also, consider installing a driver feedback sign to the west of the crosswalk that shows not only the speed limit but also tells drivers their current speed. These signs are proven to slow down most drivers.

2. Crosswalk east of Bedford and Rock

The crosswalk just to the east of the intersection of Bedford Road and Rock Street has poor visibility to the east, especially for pedestrians crossing Bedford Road south to north. This crosswalk is also lacking curb ramps. (See Figure 18)

Recommendations: Remove the crosswalk entirely. This is not a place where people should cross the street. Crosswalks should be installed only where it is safe to cross. There are plenty of other safe places to cross Bedford Road.

3. Intersection of Bedford Road and Burlington Street

The intersection of Bedford Road and Burlington Street is quite large. The crossings of the three legs of this intersection are mostly adequate, but on the southeastern corner of the intersection the curb radius is quite large. Because of this, the distances

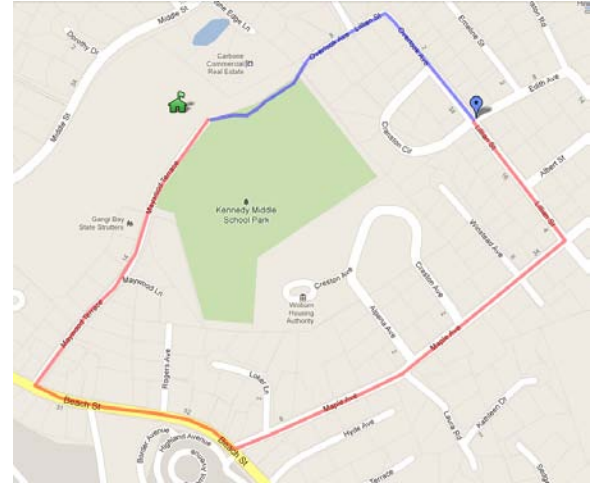


Figure 16



Figure 17

across Bedford Road west of Burlington Street, as well as Burlington Street south of Bedford Road, are longer than they need to be. As a result, pedestrians are “exposed” to traffic for more time than necessary. Furthermore, the large turning radius allows drivers turning right onto Burlington (south of Bedford Road) to do so at a faster speed than they would if the corner were sharper. (See Figure 19)

Recommendations: Painting curb extensions and installing flexible delineators would effectively narrow traffic lanes and shorten crossing distances. This would also slow vehicle speeds around corners.

4. Path from Hurd School to Sheridan Street

There is an unmarked path that connects the Hurd School to Sheridan Street less than 1/4 mile north of the school grounds. The asphalt is in need of improvement along most of this path. This route would cut the walking distance to the Hurd School for a student walking from most anywhere north of the school. The fact that the path is not marked causes one to wonder if the path is widely used or even known about.

Recommendations: Improve the walking surface of the path and install signage at both ends of the path.

5. No sidewalk around school

Where the path from Sheridan Street connects to the parking lot at the Hurd School there is not currently a sidewalk immediately adjacent to the school building itself. There ought to be a protected area for pedestrians here, especially because it is in a parking lot where vehicles could be backing up and there is limited visibility when parked cars are present. If not a concrete sidewalk, perhaps paint and bollards could be used to indicate the pedestrian space. (See Figure 20)

Recommendations: Short-term/small-investment: Using paint, designate a pedestrian area around the building from the end of the path that leads to the main entrance. Separate the pedestrian area from the parking lot’s circulation using flexible delineators or other easily seen object (such as large planters) that would separate the pedestrian area from the parking area. Long-term/large-investment: Build a sidewalk around the building that connects the path to the front entrance to the school.

6. Winn and Sheridan

There are no curb ramps where the sidewalks along Winn intersect with Sheridan Street. A crosswalk would be helpful here so those traveling along Winn can easily access the better quality sidewalk along the east side of Winn Street. Also since Sheridan connects to the path that goes to the back of Hurd School, the crossing should be marked here.

Recommendations: Install curb ramps, a crosswalk, and pedestrian crossing signage on Winn Street northwest of Sheridan Street.



Figure 18

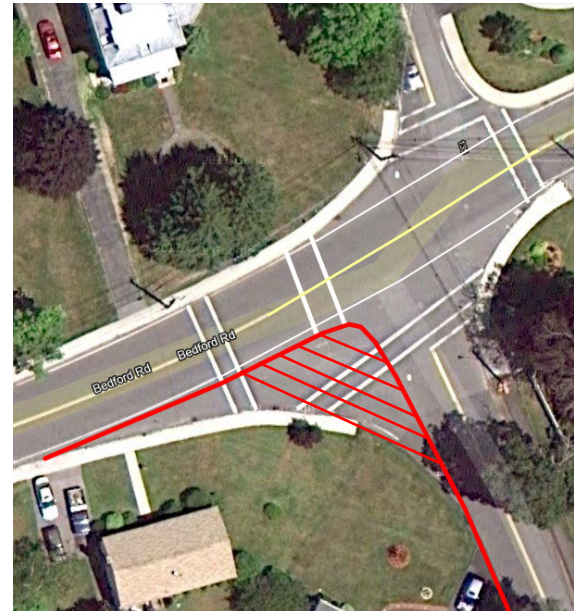


Figure 19

7. Bedford and Winn

Winn Street is missing a crosswalk, ramps and pedestrian signal where it intersects with Bedford Road and Wright Street. It is the only leg of this major intersection that is missing a marked crosswalk. In order to cross Winn Street safely and legally, one would be expected to cross three times.

Recommendations: Add a marked crosswalk, accessible ramps and a pedestrian signal at Winn Street where it intersects Bedford Road and Wright Street. It's the shortest crossing distance of any leg in the intersection.

8. Rag Rock and Bedford

Rag Rock Drive becomes very wide at the intersection with Bedford Road. It isn't necessary for a small residential street (not even a through way) to have such a large curb radius. This intersection is also missing a crosswalk parallel to Bedford Road. Across the street, the intersection of Bedford Road and Elijah Street has a much shorter crossing distance and a marked crosswalk. (See Figure 21)

Recommendations: Ideally the intersection of Rag Rock and Bedford should be more like Elijah and Bedford. Shortening the crossing distance by narrowing the width of Rag Rock may be costly. At very least, a crosswalk should be painted and a School Zone / Pedestrians Crossing sign should be installed to remind drivers headed toward Bedford to expect (young) pedestrians.



Figure 20



Figure 21

Wyman Elementary School

Wyman Elementary School is located on the edge of a residential neighborhood adjacent to a small business district north of Downtown Woburn. It fronts Main Street (MA Route 38), an arterial road that runs north from Downtown Woburn to Interstate 95/MA Route 128 on the northern edge of Woburn. Pedestrian access to the school is from Main Street, with parking areas and vehicular access on Eaton Avenue and Newbury Street behind the school.

1. Area behind school and Newbury Street

The area east of the school grounds where Newbury Street intersects with the school driveway is potentially dangerous. This is a student drop-off area marked for buses transporting students with disabilities. There is also a bus drop-off to the south, where more large vehicles could limit visibility. Currently there are white icons painted on the pavement that appear to indicate that this is a school zone. (See Figure 22)

Recommendations: Replace the icons with a high-visibility crosswalk and pedestrian crossing signage. The crosswalk should connect from Newbury Street to the walkway that leads to the door at the rear of the school.



Figure 22

2. Curb cut north side of school

There is a very long curb cut on northern edge of the school grounds along Eaton Avenue, west of the chain-link fence that separates the two parking lots. Long curb cuts allow vehicles to enter/exit the parking area at higher speeds than they would if there were two small curb cuts

Recommendations: Short-term/Small-investment: Paint a white line that further defines where the roadway ends and the sidewalk begins. Long-term/large-investment: rebuild the sidewalk so that there is a curb that separates the walking zone from the vehicular travel lane, providing at least one ramp for vehicular access if this is desired.

3. Vegetation on sidewalk on Eaton

The sidewalk east of the Wyman School grounds (south side of Eaton Avenue) is crowded with vegetation and low hanging tree branches. (See Figure 23)

Recommendations: Trim back the weeds and tree branches so the sidewalk remains passable.



Figure 23

4. Crossing at Eaton and Mishawum

The crosswalk at Eaton Avenue and Mishawum Road (across Mishawum) has very limited visibility to the southwest, where vehicles are known to exceed the speed limit. A passer-by elaborated on how dangerous this crossing is in his view. This crossing is also missing curb ramps. (See Figure 24)

Recommendations: Because we know many people use this crosswalk, it may not be advisable to remove it or move it to another location. Instead traffic must be calmed heading downhill toward this crosswalk with an appropriate traffic control device. Perhaps a push-button activated rapid-flash beacon with bright green pedestrian crossing signage to alert drivers that pedestrians are present. If speeding is a persistent problem along this stretch of Mishawum Road, a radar speed limit sign could be installed to help slow traffic.



Figure 24

5. Crossing at Lowell and Main

a. The distance across Lowell Street where it intersects Main Street is very long. Pedestrians crossing Lowell Street here are “exposed” for quite a long time. (See Figure 25)

Recommendations: At very least, a high visibility crosswalk should be added here, especially since it is so close to a school. If the City were to take on a more ambitious project, curb extensions could be installed (in addition to a crosswalk) to shorten the crossing distance, or the intersection’s geometry could be altered to force vehicles to take turns here more slowly.

b. Crossing Main Street toward Lowell Street can also be dangerous, as the view to the left is obstructed by parked vehicles and a bend in the road.

Recommendations: Short-term/small-investment: Paint a “curb extension” where vehicles should not be parked, so that pedestrians could step partially out between parked vehicles to look for traffic heading north on Main Street. Long-term/larger-

investment: Build a concrete curb extension that would allow pedestrians to “sneak and peek” around the curve in the road and the parked vehicles.



Figure 25