

Chapter 8

Transportation



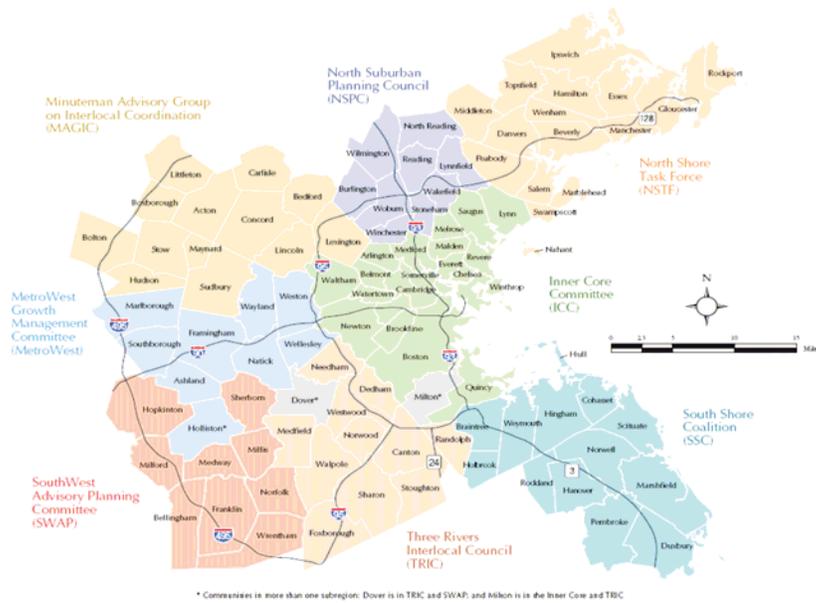
CHAPTER 8: Transportation

A. Background

Transportation and all the issues it encompasses are a key component of our community’s Master Plan. This chapter deals with a variety of issues surrounding mobility, connectivity, and access.

“Transportation” is a broad term and can mean different things to different people. We use the term for everything from our state highways to the Assabet River Rail Trail, and from the way we use our sidewalks to the option of a public shuttle that could drop people off at the train station. However, for the purposes of this chapter, we are primarily concerned with those issues related to transportation that can be impacted and influenced by the local policy choices made by the Town of Stow. Issues that fall into this category include roads and roadway maintenance, participation in a Regional Transit Authority, development of trails, sidewalks, and other linkages, safety, parking, congestion, and traffic impacts.

FIGURE: 26 Metropolitan Planning Organization



Stow is a member of the Boston Region Metropolitan Planning Organization (MPO), which coincides with the boundaries and falls within the planning region of the Metropolitan Area Planning Council (MAPC), a planning organization established by MGL Chapter 40B, Sections 24-29 and comprising 101 cities and towns in the greater Boston region.

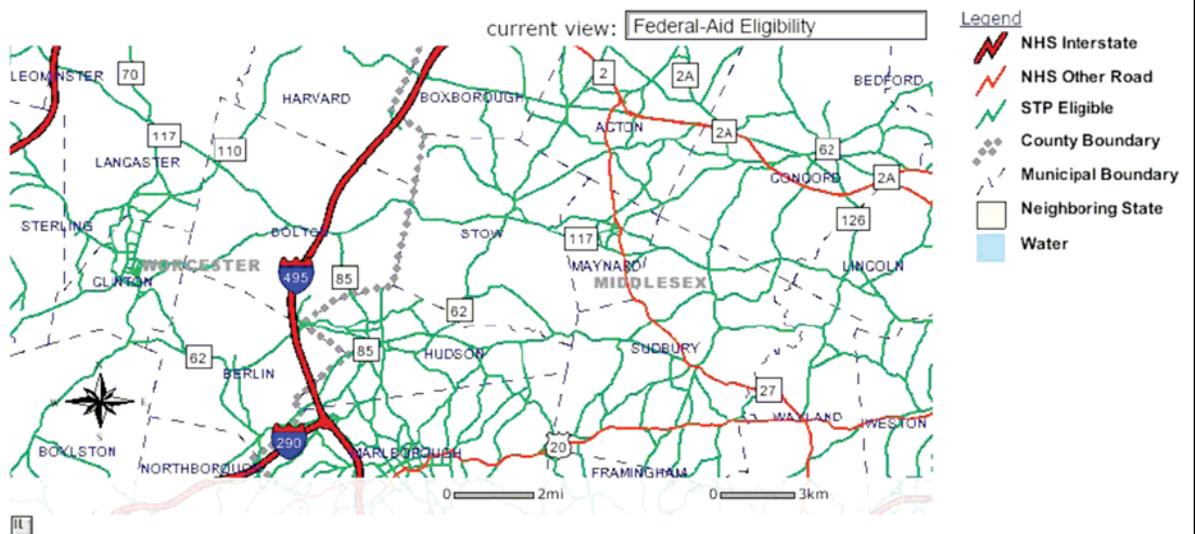
Stow is within the MAPC subregion known as “MAGIC,” which stands for the Minuteman Advisory Group on Interlocal Coordination. The Boston MPO is responsible for programming transportation funds for federal aid projects within its jurisdiction.

It is relevant to note that should Stow wish to seek Boston MPO funding of any projects, only certain roadways designated as eligible can receive federal aid assistance. Those roads tend to be the roads with particular functional classifications such as *Collectors and Arterials*.

The Massachusetts Department of Transportation (MassDOT) website notes the following:

Functional classification defines the character of services that a particular roadway is intended to provide. Roads serve to provide mobility for vehicle access to locations. The process of functional classification was mandated by the Intermodal Surface Transportation Efficiency Act of 1991 and implemented in 1993 by the Office of Transportation Planning in cooperation with the 13 regional planning agencies.

The roads noted in green below are those roadways which can receive federal aid transportation funds:



B. Vision

We envision a transportation network for our community that is safe and convenient for pedestrian and vehicular traffic alike while also preserving and enhancing Stow’s quality of life. Our preferred network would encourage healthy living and recreation by making it easy for people to walk or bike if they wished to do so; it would lessen congestion for those who drive their own cars; and it would offer sufficient public transportation options for those who choose to cut back on their individual car use, whether for environmental, economical or physical fitness reasons.

C. Comparison to the Last Plan

In 1996, it was reported in the Master Plan (titled “Stow 2000”) that Stow had 50 miles of public roads and 10 miles of private roads. The total miles of roads a community must

maintain impact the municipality's receipt of Chapter 90 road maintenance funding, which is calculated in part based on a formula that includes total miles of local roads (and in part on population and employment data). Stow's apportionment in 2010 was \$204,963, based on 51.57 miles of public roads, population: 5,902, and employment: 2,098. As of May 2009, the Town of Stow has 60.32 miles of public roads. The Master Plan Committee recommends that the Town update the road inventory with the Department of Transportation on an annual basis. This will enable the Town to maximize its receipt of Chapter 90 monies and obtain full credit for the roads it has within its borders.

In recent years, two traffic studies focusing on specific areas of Town have also been conducted. Copies of those studies are available at the Planning Department. Those plans have helped to inform the concepts and recommendations later in this chapter.

Since funding is the greatest impediment to making roadway improvements, it is also important for the Town to monitor opportunities for funding through grants or other funding streams. As mentioned above a select few roads are eligible for Boston MPO funding through the Transportation Improvement Plan (TIP). However, in order to obtain such funding, the Town would need to go through a lengthy design and review process with MassDOT. Nonetheless, participating annually in the TIP development by, at the very least, designating a local TIP Coordinator is one way to ensure that no opportunity is missed or overlooked. This is especially important for state numbered routes and bridges within the community.

D. DATA

1996 Master Plan Commuting Data

| <i>Commuting to Work</i> | |
|---------------------------------|---------------|
| No. of workers 16 yrs. + | 2,939 |
| Drive alone | 82.1% |
| Drive in carpool | 6.94% |
| Use public transportation | 3.03% |
| Use other means | 0.54% |
| Walk or work at home | 7.38% |
| Mean travel time to work | 23.67 minutes |

Census 2000 Commuting Data

| Commuting to Work | |
|---------------------------|--------------|
| No. of workers 16 yrs. + | 3,112 |
| Drive alone | 84.2 |
| Drive in carpool | 4.6% |
| Use public transportation | 3.5% |
| Use other means | 0.1% |
| Walk or work at home | 7.1% |
| Mean travel time to work | 31.1 minutes |

There has been very little materially relevant change in commuting patterns since 1996. However, minor, perhaps insignificant, shifts do seem to be occurring. Unfortunately, single occupancy vehicular trips as a mode of transportation have increased slightly. Fewer people are using public transportation and fewer are using other means of travel to get to work. This may reflect the increasing dispersal of jobs throughout the region in a greater sprawling pattern with less employment concentrated in central urban areas. As the I-495 and 128 regions continue to grow, fewer workers are likely to be traveling into Boston, and options for public transportation, carpooling, and other alternative modes are less viable when employment is decentralized.

With the soon to be released Federal Census for 2010, the Town will have more updated information on which to base any future policies relative to transportation. Perhaps, if smart growth initiatives begin to bear fruit, there will be more opportunities in the future to encourage ride-share, and small-scale transit such as shuttle buses and van pools.

In 2004, concurrent with the drafting of a Community Development Plan, a forum was held at which participants generated a list of transportation-related issues and concerns. Many are no longer relevant today, either because they have now been resolved or because priorities have changed; however, the MPC believes the following still have merit. The bullet reflects the original 2004 text; the wording in parentheses reflects the MPC's current position.

- There is a need for electronic signs. (One has recently been acquired. The MPC agrees that usage of this sign will be a valuable asset.)
- Lower Village study to include traffic circulation and economic development options. The Lower Village Subcommittee recently conducted an extensive traffic study. The key result of that study was recommendation of a roundabout. (The MPC recommends that the Selectmen pursue funding for further steps, such as a feasibility study and preliminary design, through either grant opportunities or other municipal appropriations.)

- Improve parking at Town Building. (In May 2009, Town Meeting voted appropriation of funds to improve parking at the Town Building. The MPC recommends that this work continue.)

E. Discussion of Needs

1. Intersections

As the Town of Stow continues to grow, congestion and safety issues surrounding intersection capacity are likely to become more of a concern. It is important for the community to regularly monitor both intersection functioning and intersection safety factors so that there is a clear sense of which intersections may need improvements. Keeping an eye on this list will ensure that the Town has problem intersections evaluated when nearby development permitting presents an opportunity for the Town to request traffic studies. The Town might also choose to seek program design and/or improvement funds for projects of greatest concern.

Transportation specialists assign an “LOS,” or “level of service,” rating to intersections in roadways throughout the commonwealth. The rating reflects the delay a driver experiences when traveling through an intersection. The standardized measure of level of service ranges from A to F. In a suburban setting, the typical functioning level of service range is C-E, which means a delay of 20 to 80 seconds for motorists attempting to make a specific turning movement. Generally, an E represents a compromised intersection operating near its capacity and an F is a failed vehicular movement. However, it is not uncommon for an intersection to be rated F for left turns only or rated E during rush hour but considered to function adequately at other times of the day. Each intersection’s level of service is determined by the configuration of the intersection, and the ability of an intersection to accommodate the traffic demand that is placed upon it.

The Town's Safety Officer and Fire Chief have identified the following list of intersections as areas of concern. The Master Plan Committee further includes those intersections noted below as intersections to watch carefully when development impacts occur:

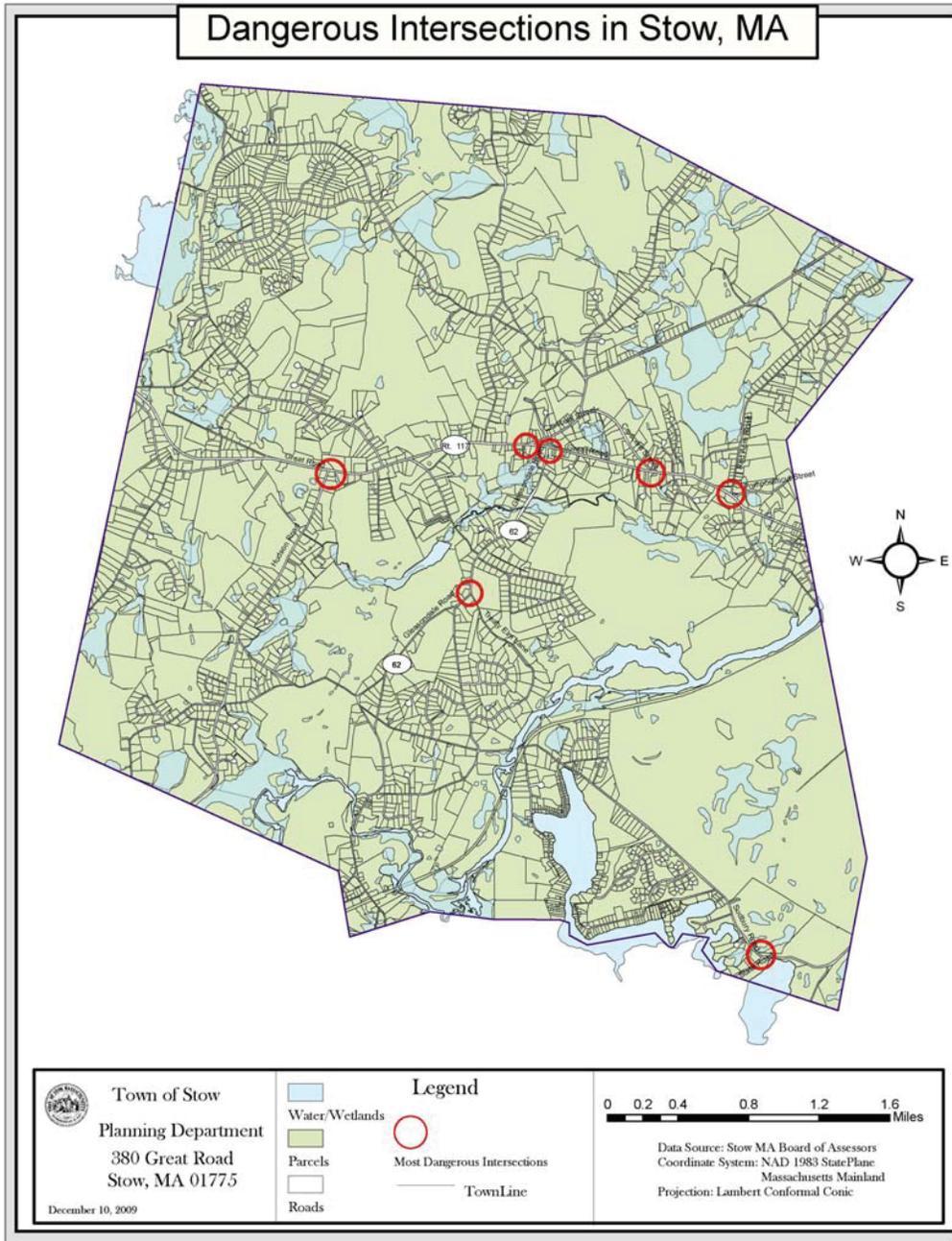
FIGURE: 27 Table of intersections of concern

| Intersection Name | Quadrant | LOS (if known) | High Crash rating? (Y/N) | Issue / Concern (eg. Pedestrian crosswalks, delay, turning movements) |
|---|-------------------------|--|---|---|
| Route 117 at Red Acre Rd | Northeast | Red Acre Road southbound = F | 2001 reported = 0 2002 reported = 2 2003 reported = 1 | Pedestrian crosswalks, delay, turning movements |
| Route 117 at Pompositticut Street | Northeast | Pompositticut Street southbound: a.m. peak = C p.m. peak = F | 2001 reported = 1 2002 reported = 0 2003 reported = 1 | Pedestrian crosswalks, delay, turning movements |
| Gleasondale at Treaty Elm | Southeast | | | Sight lines/dangerous curve |
| Gleasondale and Great Road | Northeast and Southeast | | | (Limited visibility responding from the Fire Station looking west on Route 117) Lack of pedestrian crossways |
| Hudson Road and Route 117 | Southwest | | | Limited visibility |
| State Road (Hudson line to Sudbury Road) | Southeast | | | Limited visibility |
| Crescent Street (Both intersections with Route 117) | Northeast | | | Limited visibility |

In addition, the Lower Village Traffic Study, developed by Fay, Spofford & Thorndike identified at least 12 turning movements into roads or driveways along Great Road that are currently at LOS F and several more that are at LOS E. That study evaluated a number of different solutions to address safety and congestion in Lower Village. Intersection enhancements, a roundabout, and signalization were the three primary alternatives evaluated in that study. For those interested in traffic considerations, that study can be obtained from the Planning Department. It should be noted that the Lower Village Committee strongly favors the roundabout option at two locations (Rt. 117, Red Acre, & Pompositticut Roads and Rt. 117 & Elm Ridge Road) while some residents and perhaps even businesses are not in support of that

option. Nonetheless, for safety reasons and to address congestion and pedestrian mobility, some action needs to be taken in the Lower Village area. The Master Plan Committee recommends further evaluation, dialog, and consensus building to be undertaken so that improvements can move forward. Some of these intersections are further depicted on the following map:

FIGURE: 28 Map of Dangerous Intersections



In addition, the MPC suggests as a lower-order priority that a traffic calming policy be developed. The following links provide useful information on how other communities have successfully implemented traffic calming policies:

Federal Highway: <http://www.fhwa.dot.gov/environment/tcalm/index.htm>

Northampton - <http://www.northamptonma.gov/tpc/trafficcalming/>

Newton - http://www.ci.newton.ma.us/cdbg/transportation/documents/traffic_calming_guidelines.pdf

Burlington VT - <http://www.dpw.ci.burlington.vt.us/transportation/neighborhoods/>

MassDOT (formerly MassHighway) also has entire sections in its design manual dedicated to traffic calming and bike/pedestrian safety. See chapters 11 and 16 of that document in particular: <http://tinyurl.com/5bddeo>

2. Bike and pedestrian mobility

a. Sidewalks

There is considerable interest in expanding the sidewalk network in Stow. Some people in town have expressed a desire to have sidewalks for mobility in getting from place to place, but a significant majority have identified recreational use as their primary motivation for wanting sidewalks in town. The recent Master Plan Survey revealed the following:

The Planning Board recently formed a Pedestrian Walkway Planning Sub-Committee, comprising two Planning Board members, one member of the Board of Selectman and two members-at-large, tasked with the preparation of a Draft Pedestrian Walkway Master Plan to enhance the Town's sidewalk network. The committee will consult with the Superintendent of Streets, Board of Selectmen, Conservation Commission and Board of Health and incorporate the Town's goals of creating a pedestrian link between neighborhoods and an "Emerald Necklace Trail" linking conservation areas with walking trails, where feasible.

If there were more sidewalks or trails, would you or your children use them regularly for either of the purposes below? (Check all that you support)



It will be important for this committee to also consider opportunities for key linkages between subdivisions and cul-de-sacs where easements may be needed in the future. This is an often overlooked opportunity to connect neighborhoods via trails or walkways and reduce the

number of vehicle trips that must be taken to drive children to a house around the block or to visit a neighbor. Strategic planning around large tracts of undeveloped land can help the Planning Board make requests of future developers to include these easements and/or build the walkway connections as part of their subdivision plan. Often, a small connection between backyards can be accomplished with a few hundred feet of trail, while but that same trip by car would amount to a drive of a quarter-mile or more. To assist in this endeavor, it would be productive for the Town to develop GIS mapping of all existing easements, rights of way, and trail connections to provide a visual representation of opportunities to enhance connectivity.

One recommendation pertaining to sidewalks worth noting is the notion of developing “pathways” or “pedestrian ways” that are set back from the road away from traffic. Several nearby Towns (such as Sudbury and Lincoln) use this approach when constructing new sidewalks to avoid disturbing street trees, rock walls, and other natural land features. While ROW can be an obstacle to this type of sidewalk, the benefits can often outweigh the sometimes added complexity of working with abutters to lay out a sidewalk of this type. Snow plowing, for instance, does not end up being pushed onto these more detached pedestrian ways as they are distant from the impacted area.

The biggest impediment to building sidewalks is, of course, funding, as the capital costs can be quite daunting. Moreover, obtaining easements and developing engineering solutions to navigate around stone walls, trees, significant grade changes, and other obstacles can be equally challenging. Stow may want to look to communities such as Sudbury and Lincoln for an example of path-building that can accomplish many of the same goals as sidewalks but in some cases be built to a less robust standard. Paths in these communities tend to meander around obstacles in the natural and built environment and minimize disruption. As an added benefit, abutting property owners are often more accepting of such designs.

Finally, it may be worth exploring the feasibility of utilizing betterment assessments as a source of complementary funds to augment direct town appropriations. In this fashion, neighborhoods advocating most vociferously for a sidewalk can elect to incur a tax surcharge and match municipal funds to advance their projects. Such betterment surcharges are typically amortized over 20 years and shared among the property owners either on a per house basis or per linear foot of frontage. Either method can be valid depending on the particular circumstances of the street receiving the betterment.

3. Safety

Increasingly, roadway planning now includes a component for bike and pedestrian safety. The Safe Routes to School program, founded in 2005, provides limited funding to help communities address getting children safely to school on bike or foot. The Master Plan Committee recommends that Stow investigate the possibility of participating in the program. The committee also recommends evaluating curb cuts.

4. Roundabouts

Modern roundabouts have become a favored solution, in lieu of a traffic signal, to improve vehicular circulation and safety. When properly located, designed, and constructed they reduce overall vehicular speed while simultaneously reducing congestion. The idea is that cars flow continuously through the roundabout but at slower speeds. Unlike traditional “rotaries” vehicles enter roundabouts at a 90 degree approach and must therefore slow to a near stop prior to entering circulation. However, some people feel that a roundabout can sacrifice pedestrian mobility through an intersection as it can be challenging to site crosswalks with adequate site-distances to provide safety. Considerable literature can now be found on the use of roundabouts and MassDOT is favoring the use of these devices as they also eliminate the need to maintain traffic lights and pay for electricity usage. For more information on roundabouts, the reader is directed to:

http://www.mhd.state.ma.us/downloads/designGuide/CH_6.pdf

It should be noted here that the Lower Village Committee is strongly favoring a roundabout at the intersections of 117, Red Acre Road, and Pompositticut Roads along with a roundabout at Route 117 and Elm Ridge Road. That committee also feels roundabouts should be considered when the Town evaluates design alternatives for other intersections throughout town. The Master Plan Committee supports pursuing improvements to traffic in Lower Village. However, the Master Plan Committee also wants to acknowledge that public opinion may not yet be ready to embrace roundabouts. Further outreach, education, and analysis might be necessary to achieve consensus before the Town could move forward with design plans at various locations.

In general the Master Plan Committee is in favor of passive traffic solutions throughout town where such solutions make sense from a safety perspective. It is our preference to avoid the installation of numerous traffic lights that may only be needed during peak periods of travel. Traffic calming, pedestrian refuge islands, and other creative methods to slow traffic or channelize it in a safer fashion is preferable to the cost and unsightliness of adding new traffic lights.

5. Shoulder width

Roadway widths are typically being increased to accommodate a 4-foot shoulder for bicyclists, and new techniques are often added to allow greater ease in crossing roads. This can sometimes present a problem for a community such as Stow which is trying to preserve rural character and protect wetlands. Any increase in overall road width can often come into direct conflict with the desire to keep stone walls, meandering ways, and maintain the scenic elements of the roadway. Nonetheless, where possible, when roadways are being reconstructed, every effort should be made to accommodate a shoulder for bike and pedestrian use.

6. Crosswalks

Pedestrians are an integral part of the transportation system, and should be able to cross roads safely. Although marked crosswalks are traditionally used to facilitate pedestrian crossings, in some instances other treatments should be considered to provide a safer environment for pedestrians. Alternative treatments could include:

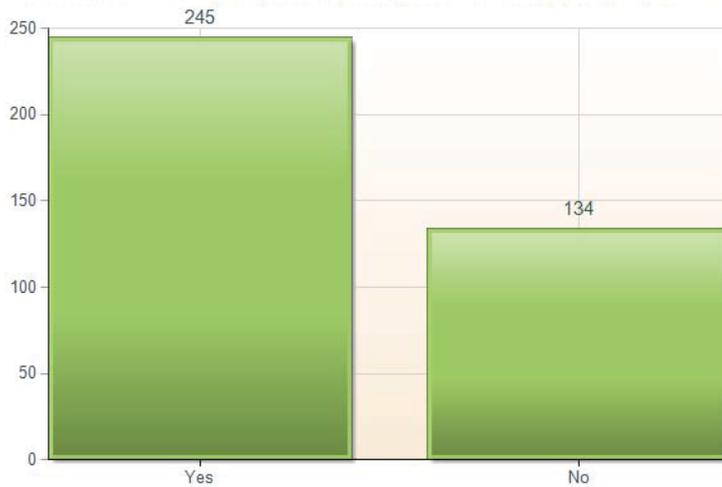
- Angled crosswalks in pedestrian refuge islands to direct pedestrians to face oncoming traffic
- Raised crosswalks
- “Dragon teeth” to designate an upcoming crosswalk
- Pedestrian refuge islands
- Pedestrian signals
- “Stop for Pedestrians” signage

The Town should continually work to improve safety and encourage pedestrian traffic. The Master Plan Committee recommends that the Town adopt guidelines identifying the preferred kind of crosswalk treatment for various types of crossings and then use that policy to implement a consistent format throughout town. Priority locations for new crosswalks should be at school crossing locations and destination areas such as the Lower Village business zoned area and town recreation fields.

7. Refuge islands

Pedestrian refuge islands are usually defined as a small section of pavement or sidewalk, surrounded by asphalt or other road materials, where pedestrians can stop halfway across the street while crossing the roadway. Not only do they make pedestrians safer by giving them a traffic-free spot on which to stand; they also have the secondary effect of creating an interruption to the traffic flow that slows cars down. Our Master Plan Survey revealed strong support for refuge islands as shown on the following graph:

In order to slow traffic and accommodate pedestrian crossing, the Town installed temporary pedestrian refuge islands in the Lower Village area. Would you support installation of permanent pedestrian refuge islands?



8. Trails

The Assabet River Rail Trail (ARRT) has been under design and development for more than a decade. This trail will eventually be a 5-town multiuse trail connecting the communities of Marlborough, Hudson, Stow, Maynard, and Acton. The Marlborough and Hudson section, comprising approximately 5.5 miles, has been constructed and is open for public use. The Acton and Maynard sections are presently under design. For more information on the trail in general, go to www.ARRT.org. In Stow, the ARRT Committee has been engaged in discussions over an extended period of time to try to find ways for Stow to complete its section of the trail. See Figure 17 in Chapter 6 for ARRT Map.

The Town has acquired a two-mile easement over a portion of the railroad right-of-way which is presently in private use as “Track Road.” Efforts may soon be underway to evaluate design possibilities for a trail along that section. However the actual route for some areas of the trail is still to be determined.



The two-mile easement over “Track Road is depicted in green. Sudbury Road is depicted in yellow. The Maynard Town Line is depicted in red.

The Stow ARRT Committee voted on Feb. 17, 2009 to use existing trails in the Assabet National Wildlife Refuge for some of the route through Stow. The committee is now working on ways to connect the northern end with the Rail Trail in Maynard and the southern end with the Hudson Rail Trail. The Master Plan Committee strongly supports prompt completion of this project since state and federal funds may not be available much longer.



From the collection of R.R. Conard B&MRRHS

9. Public Transit

In 2007, the Board of Selectmen voted to join the Montachusett Regional Transit Authority (MART), a separately constituted legal entity that provides transit services. The primary motivation behind this vote was a recent state law that allowed towns without MBTA service to deduct money paid to RTAs from their annual MBTA assessments. MART is one of Massachusetts' 15 regional transit authorities. It is a public, non-profit organization charged with providing public transportation to an area consisting of the cities of Fitchburg, Leominster and Gardner, and the adjoining towns of Ashburnham, Ayer, Shirley, Lancaster, Sterling, Hubbardston, Royalston, Littleton, Winchendon, Ashby, Templeton, Westminster, Hardwick, Lunenburg, Harvard, Bolton, Boxborough, and Stow.

MART operates 15 fixed route bus services together with paratransit services. It also provides connections to the MBTA Commuter Rail line at Fitchburg station. Currently, MART provides Stow with a senior van. Discussions have taken place regarding a shuttle service to the South Acton train station, but there are no specific plans to increase MART's service within Stow at the moment.

The Master Plan Survey revealed that there is a reasonable level of interest among the populace for a shuttle from Stow to the South Acton train station as well as a few nearby shopping areas. Of the 387 respondents, 87% answered “yes” to the question “If a public shuttle service were available in Stow, would you use the shuttle to/from the South Acton Commuter Rail Station?”, while 34% said they would use a public shuttle service to nearby retail and business areas in Stow as well as in Maynard, Acton and/or Concord.

There are other factors we must consider as well when evaluating if we have adequate transit services in town:

- Is the Town providing a sufficient level of public transportation for those who wish to use it?
- Are factions such as the elderly and disabled for whom driving may not be an option adequately served by public transportation options?

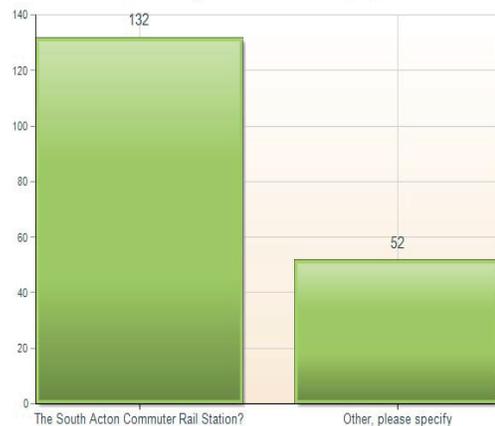
The MAGIC subregion of MAPC is presently pursuing a number of studies and initiatives to help expand suburban mobility within the

region. One is a study with a working group, to identify the small-scale public and private transit options within the region and make suggestions on cross-community connections to augment those present activities. For more information on MAGIC’s activities, go to

<http://www.mapc.org/subregions/minuteman-advisory-group-inter>

The other study is an effort to evaluate whether or not bus rapid transit (BRT) could be developed in conjunction with the proposed rail trail slated to be built on the MassCentral Branch Railroad. This trail is known as the Wayside Trail and it runs roughly from Waltham through, Weston, Wayland, Sudbury, Stow, Hudson, Bolton, and on to Clinton. A BRT or some other form of public transit in conjunction with the trail would be of great benefit to the residents of Stow, who presently have no public transportation options (except the Senior Shuttle). The MPC recommends that Stow participate actively in the efforts of this MAGIC study and follow closely the possibilities and recommendations that could come out of this study. It may also be appropriate for the Board of Selectmen to designate an individual to act as Stow’s liaison in this matter. A point person could become the local expert, providing information to appropriate Boards including the Selectmen and Planning Boards and represent Stow’s interests at various meetings and venues at which this topic will be discussed.

If a public shuttle service were available in Stow, would you use the shuttle to/from (please check all that apply)



A. Action Items

- Pursue participation in the state's Safe Routes to School program
- Participate actively in the efforts of the MAGIC study to evaluate whether or not bus rapid transit (BRT) could be developed in conjunction with the proposed rail trail slated to be built on the MassCentral Branch Railroad and follow closely the possibilities and recommendations that could come out of this study.
- Pursue funding for further steps that would follow up on the recent Lower Village traffic study, such as a feasibility study and preliminary design, through either grant opportunities or other municipal appropriations.
- Pursue means to connect the northern end of the Stow Assabet River Rail Trail with the Rail Trail in Maynard and the southern end with the Hudson Rail Trail while state and federal funding are still available to do so
- Pursue the development of a town-wide Traffic Calming policy and include in it the preferred construction form of crosswalk treatments appropriate for various types of roadway crossings
- Monitor and participate in decision making on opportunities for expanded transit service through MART or MBTA
- Explore opportunities for funding of roadway projects through the Boston MPO including designating a staff person to act as the municipality's TIP Coordinator.