



## *Consideration of Strategies*

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In this section, analysis is translated into a set of proposed actions. After examining existing conditions in the transportation network for all modes, the Transportation Element Advisory Committee (TEAC) then began the next phase of its work, which was the consideration of alternative strategies for addressing the transportation problems identified. The intent, as with all planning processes, was to modify and narrow down that list, eventually ending up with a final set of priority recommendations.

The section is generally organized by transportation mode (transportation demand management (TDM), transit, bicycling and walking, and roadways, as well as land use), each of which was considered by the advisory committee. The measures were developed in consideration of the existing transportation system and services in Lexington, as well as the land use and travel patterns (see Existing Conditions). For each mode, emphasis was placed on complementing existing services or making more efficient use of existing infrastructure. The data were analyzed to determine where new or expanded transportation services might fill a need and be at least somewhat competitive with automobile use. Greater detail is offered below.

Not all actions discussed in this section were deemed by the TEAC to be of sufficient priority in relation to the other proposed measures to proceed into the final Implementing Actions Plan outlined in the last section of this document. This exclusion in no way precludes their consideration for future action.

## ROADWAYS

The Selectmen's 1999 Vision 2020 project, along with the 2002 ComPlan, set forth a strategy that has informed this transportation planning process – that the road network should only be 'fixed' where doing so is unavoidable. Transportation planners maintain that the construction or improvement of new roads can only temporarily improve traffic conditions. The improved travel times, safety, or accessibility of new areas created by improved infrastructure induce greater travel demand, which quickly consumes the new vehicular capacity. In this plan, this concept has led to a focus on the intersections where level of service failure and safety are so problematic that there is little choice but to make improvements wherein traffic flow and safety may be improved. The assumption has also been that excessive increases to intersection vehicular capacity, as well as construction of grade-separated intersections, were to be avoided.

Potential roadway improvements were identified based on a strategy of maximizing the efficient use of existing roadway infrastructure. This strategy complements another important one of restraining traffic growth and the need for roadway improvements, by providing alternatives to driving alone, such as TDM and transit. A key objective in all of this is to maintain the existing community character of Lexington. As a result, no new roadways or major roadway widenings were considered. The types of improvements considered included:

- ❖ Lane use changes at intersections
- ❖ Intersection geometry improvements
- ❖ Traffic signal timing and phasing changes
- ❖ Addition of new traffic signals
- ❖ Traffic calming measures, including roundabouts, bulbouts, and traffic islands

Traffic calming is a method of using physical infrastructure to moderate driver behavior. It generally slows vehicle speeds by carefully introducing features such as roundabouts, neckdowns, traffic platforms, curves or other measures, which creates a safer environment for drivers, cyclists, and pedestrians alike.

Since traffic calming measures slow vehicle speeds, they can be ideal solutions to the problem of through traffic on local streets, or 'cut-throughs'. Consistent congestion on arterial roads can divert fast-moving commuter traffic to local streets, creating both quality-of-life and safety issues for residents. Many residents demand that their streets be made one-way, or closed entirely to non-local traffic. Not only do both of these solutions create new problems on other local streets, but the latter might also create legal issues. A public street network cannot be selectively privatized. The best solution is to reduce the systemic traffic congestion, which would then remove the incentive for commuters to use local streets. Where this is not possible, traffic calming can be introduced to slow vehicle speeds. This both increases safety and reduces the attractiveness of the local street as a 'cut-through'. This must be done cautiously, however, so as not to unduly impact other local streets.

Traffic signals have only been proposed after much thought. Transportation engineers maintain that, for an intersection with ongoing level-of-service failure, signalization is preferable to stop-sign control and police control in both safety and traffic operation. Stop-sign control can be

dysfunctional and dangerous with high vehicular volumes. Police detail control offers a quick traffic control mitigation but is subject to human inconsistency and error, the vagaries of weather and the uncertainties of personnel availability. While some residents may object to signalization based on the perceived nuisance impacts of traffic queuing, these concerns can be partially allayed with optimum signal timing that is demand-triggered.

Criteria for selecting intersections to be analyzed for possible improvement included: incidence of accidents at the location; peak hour delays and queues; and geometric deficiencies. The number of intersections that could be reviewed for possible improvement as part of the development of the Transportation Element was limited. The twelve intersections listed below were advanced for review based on their accident history and the other statistical measures, as well as discussions with the Town of Lexington Planning and Engineering Departments.

The remaining intersections listed, although important locations with a variety of traffic issues, were not proposed for improvement at this time. Some of these secondary intersections have been the subject of earlier analyses and planning efforts. Others did not rank as high in the need for improvements but might well be strong candidates for consideration for upgrading at a later time.

### **Intersections Reviewed For Possible Improvements**

1. Bedford Street at Hartwell Avenue
2. Bedford Street at Eldred Street
3. Maple Street at Mass. Avenue
4. Lowell Street at Maple Street
5. Bedford Street at Worthen Road
6. Concord Avenue at Waltham Street
7. Marrett Road at Waltham Street
8. Woburn Street/Mass. Avenue at Fletcher Avenue
9. Pleasant Street at Mass. Avenue
10. Pleasant Street at Watertown Street
11. Old Mass. Avenue/ Mass. Avenue/ Wood Street
12. Marrett Road at Spring Street

### **Intersections Reviewed But Not Designated for Inclusion in Implementation**

#### **Reason**

- |   |                                      |
|---|--------------------------------------|
| 1. Bedford Street at Route 128                          | Highway interchange <sup>1</sup>     |
| 2. Bedford Street at Harrington Road and Hancock Street | National Register, historic district |

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<sup>1</sup> Bedford Street at Route 128 was rated as the highest accident location. This location is a full clover-leaf interchange and is under MassHighway jurisdiction. This interchange was not reviewed for improvements as part of this scope ; however it is recognized that the number of accidents warrants further review. It is also recognized that this intersection has impacts on the intersection of Bedford Street at Hartwell Avenue and vice versa. The intersection of Bedford at Hartwell will be reviewed for possible improvements and those improvements could have positive impacts on the interchange.

3. Waltham Street at Hayden Avenue	Channelization improvements implemented 1999-2000
4. Lowell Street at Woburn Street	Reconstructed
5. Hartwell Avenue at Maguire Road	Design and permitting complete. No funding for construction
6. Marrett Road at Route 128	Highway interchange
7. Mass. Avenue/ Old Mass. Avenue /Marrett Road	Lower number of accidents
8. Lowell Street at East Street	Lower number of accidents
9. Mass Avenue at Grant Street	Lower number of accidents

The criteria used to evaluate the improvements considered as part of the screening process included:

- ❖ Roadway safety/accident record
- ❖ Vehicular capacity
- ❖ Cost of likely improvements
- ❖ Impact on or constraints imposed by community character
- ❖ Pedestrian and bicycle safety
- ❖ Impacts to adjacent land uses outside of the existing right-of-way (ROW)
- ❖ Maintenance requirements

Each action was identified as a near term, intermediate term, or long term action item for implementation. The time line utilized for these recommendations is as follows:

Table 3 lists the actions considered for each intersection, the likely timeframe for each action, the number of accidents at each intersection, and the evaluation of each improvement. The time frames are defined as follows: Near Term – 1-2 Years; Intermediate – 2-5 years; Long-Term – 5+ years.

Near Term Action improvements are low in cost and can be quickly implemented. Intermediate Actions require more time to implement and involve greater cost than Near Term Actions. Long-Term Actions entail high capital investments, might involve additional major players at every step (e.g., MassHighway), or may have a longer process to be planned, designed, permitted and constructed. Such projects are likely to involve further complications such as Environmental Impact Reports. For some intersections, different improvements were identified in separate time frames.

Most of the actions were carried into the plan with minor changes and reference Goals 4.A and 4.B. Any improvements at the intersection of Massachusetts Avenue and Wood Street were eliminated because of concerns about adverse impacts on the Minuteman National Historical Park.

**INSERT INTERSECTION IMPROVEMENTS TABLE HERE (4pg)**









## **TRANSIT**

### **Strategies**

While the MBTA is the major provider of transit service in the area, it cannot be relied upon to significantly increase service to Lexington in the near future. This is due both to the MBTA's current financial struggles and Lexington's relatively low population density and outlying position in the MBTA service area. Consequently, transit strategies that could be implemented locally have been emphasized. The actions listed below generally focus on making connections between existing transit nodes, employment centers, and other activity centers. Those connections could be made by a variety of services, which could be anything from an expanded LEXPRESS service to a sub-regional transit provider, to privately funded services like the existing Alewife Shuttle.

The transit strategies considered include:

❖ **Establish Regional Commuting Links to Lexington**

Establish links to Lexington from regional transit services to provide additional transit alternatives for regional commuters to Lexington. These alternatives could be established by providing connections to commuter rail stations in nearby communities.

❖ **Improve Commuting to Lexington from Nearby Communities**

Improve connections between Lexington and nearby communities to provide additional transit options for commuters from nearby towns.

❖ **Expand Commuting and Non-Work Trip Options for Lexington Residents**

Provide additional services within Lexington to enhance non-automotive travel options for work and non-work trips for Lexington residents.

Based on the transit strategies described above, as well as analysis of relevant data, potential actions were identified and evaluated for inclusion in the Transportation Element. The following sections describe the actions listed above and indicate whether the TEAC supported inclusion of the measure in the plan.

### **Potential Actions – Regional Commuting Links**

❖ **Establish Link To Lowell Commuter Rail Line at the Anderson Regional Transportation Center in Woburn**

This measure would establish shuttle service between the major employment center on Hartwell Avenue and the Lowell Commuter Rail Line. The measure would provide service between the town's major employment center and a major regional catchment area along the I-93 corridor in northern Massachusetts and New Hampshire. This regional

**INSERT REGIONAL MAP HERE**

advantage will increase when Lowell commuter rail service is extended to Nashua, New Hampshire. One potential drawback is that the shuttle must travel in heavy traffic on Route 128. The town's Transportation Coordinator is investigating the possible use of buses that currently are deadheading<sup>2</sup> from Woburn in the morning and returning in the evening. The committee supported this concept because of the large workforce in the Hartwell Avenue area and the number of commuters from the north. **Included in Implementing Actions; Goal 2.A.1.**

❖ **Establish Link To Lowell Commuter Rail Line at Winchester Center**

This measure would establish shuttle service between the Lexington Town Center and the Lowell Commuter Rail Line. It would serve local areas in Lexington (Countryside) and Winchester. It would entail less travel through traffic congestion than the Woburn connection but would require a longer train ride for suburban commuters. It would benefit from the extension of the Lowell Line to Nashua, New Hampshire. The committee accepted this measure as a long-term action. **Included in Implementing Actions; Goal 2.A.4.**

❖ **Establish Link To Fitchburg Commuter Rail Line from Lincoln**

This would establish a connection from the Lincoln Commuter Rail station to Hartwell Avenue and Lexington Center. It would provide the best connection to the Hartwell Avenue area from the Fitchburg Line but would not provide any other transit connections or service for local residents. This measure would have little impact on traffic conditions in Lexington because it would serve commuters coming from the west to Hartwell Avenue. Because of its limited transit connections and limited impact on traffic conditions within the town, the committee did not support its inclusion in the plan. **Not Designated for Inclusion in Implementing Actions.**

❖ **Establish Link To Fitchburg Commuter Rail Line from Waltham**

This would establish a direct connection from the Waltham Commuter Rail station in Waltham Center to Hayden/Spring and Lexington Center. Currently, riders between Waltham Center and Lexington Center must transfer between LEXPRESS and the Waltham CitiBus. This action would also provide connections to other transit services in Waltham Center and would serve a significant local catchment area in Waltham. It could provide all day service to Lexington Center and peak hour service to Hayden/Spring. The committee believes this measure provides the most promising link to the Fitchburg Commuter Rail Line and supported its inclusion in the plan. In addition, it could enhance transit service along Waltham Street for Lexington residents (see *Use Commuter Rail Connection to Waltham Center to Provide Local Service to Waltham*). **Included in Implementing Actions; Goal 2.A.2.**

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<sup>2</sup> The process of a train or bus returning empty (with no passengers) to the yard or garage.

❖ **Establish Link To Fitchburg Commuter Rail Line from Belmont**

This would establish a connection from the Waverly Commuter Rail station in Belmont to Hayden/Spring and/or Lexington Center. Because this measure would provide connections to limited transit services in Waverly Square and would entail a longer train ride to reach Waverly for commuters, the committee did not include it in the plan. **Not Designated for Inclusion in Implementing Actions.**

❖ **Establish Link To Worcester Commuter Rail Line from Auburndale**

This would connect Auburndale (Riverside Station intermodal facility) to Hayden /Spring and Lexington Center. This could involve a possible extension of the Waltham connection described above. Since not all trains stop at Auburndale and there are no other transit connections available, the committee did not include this measure in the plan. **Not Designated for Inclusion in Implementing Actions.**

**Potential Actions –Links to Nearby Communities**

❖ **Provide Connection To Green Line at Riverside**

This action provides service between the Riverside Green Line stop and Hartwell Avenue or Hayden/Spring. It could serve reverse commuters from Brookline and Boston as well as a local catchment area in Newton. Because the shuttle bus would compete with auto traffic on local roadways and there would be no “guaranteed connection” due to the uncertainty of the Green Line schedule this measure was not adopted by the committee. **Not Designated for Inclusion in Implementing Actions.**

❖ **Extend MBTA Bus Route #78 (Arlmont Village – Harvard Station)**

Extend MBTA bus route #78 to Hayden/Spring during peak hours. Since this measure would be similar to the 128 Business Council TMA Alewife Shuttle service which currently provides peak hour service to Hayden/Spring, it is included in the plan in the event the 128 Business Council service is reduced or eliminated. **Included in Implementing Actions; Goal 2.A.5.**

❖ **Extend MBTA Bus Route #77 (Arlington Heights – Harvard Station)**

Extend MBTA bus route #77 to Lexington Center to provide more direct service for Arlington residents. This measure is an extension of an existing route and would be simple and relatively inexpensive to implement. The committee recommended this action. **Included in Implementing Actions; Goal 2.A.6.**

❖ **Use Proposed Connection to Commuter Rail at Waltham to Provide Local Service To Waltham**

The Waltham Center – Lexington Center Connection (as described above) could provide local service to the Lexington Street/Waltham Street corridor including a connection with other buses in Waltham Center. This measure was included in the plan because it uses one service to support regional commuting as well as improve service for residents.

**Included in Implementing Actions; Goal 2.A.2.**

❖ **Use Proposed Connections To Commuter Rail at Winchester Center to Provide Local Service To Winchester**

The Winchester Center – Lexington Center Connection (as described above) would provide limited local service and very limited service to other buses. As a result, the committee did not include it in the plan. **Not Designated for Inclusion in Implementing Actions.**

**Potential Actions – Expand Options for Lexington Residents**

❖ **Extend Hours of Operation for LEXPRESS**

Extended hours for LEXPRESS could provide an option for Lexington commuters who need service before or after existing service hours. Commuter use may be limited by the need for transfers. The potential increase in ridership might not offset the increased cost of operating this service. Because of current fiscal limitations, the committee included this measure as a long-term action. **Included in Implementing Actions; Goal 2.A.3.**

❖ **Expand Frequency of Service for LEXPRESS**

More frequent service would provide greater flexibility for Lexington commuters and non-commuting riders. Commuter use may be limited by the need for transfers and the potential increase in ridership might not offset the increased cost of operating this service. As with extended hours of operation, the committee recommended this measure as a long term action. **Included in Implementing Actions; Goal 2.A.3.**

❖ **Provide Express Buses from Lexington Center to Boston**

This measure would resurrect a service that was once provided. It would require expanded parking in the Town Center or an extensive neighborhood collector bus service to the Town Center (see LEXPRESS service improvements above). This may not provide faster service to downtown Boston than existing connections to Alewife or proposed connections to commuter rail and it would compete with existing service to the Red Line at Alewife station. As a result, the committee did not include it in its recommendations. **Not Designated for Inclusion in Implementing Actions.**

## TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is an array of strategies and actions that focus on supporting and encouraging the use of alternatives to driving alone. These include a wide variety of measures to promote carpools, vanpools, mass transit, bicycling, walking, and more. They also include actions to reduce the total amount of travel, especially during peak travel times.

Table 9, at the end of this sections, provides a list of common TDM measures and the type of trip they can effectively serve. A number of TDM measures are already being implemented in Lexington (see Existing Conditions section) and some TDM measures are not particularly applicable to Lexington’s needs. The emphasis in this plan is on reinforcing or strengthening existing actions and implementing new actions that can reasonably be expected to have an effect for this community.

Due to the fact that existing programs in Lexington are quite limited, and that many strategies under the TDM umbrella are available, the participation process delved into these alternative transportation policies in considerable detail.

To determine the appropriate measures for Lexington, the TEAC began by brainstorming answers to the question, “What would it take to get you out of your car?” To avoid limiting the discussion to preconceived ideas, this was done before the formal presentation of the “toolbox” of TDM measures generally available. Two lists were developed: one for commute trips and one for non-commute (all other) trips. Once the lists were developed, the group then voted for the five measures they thought should be the highest priority for Lexington, and prioritized them. In the next session, the survey results were used to guide a group discussion of a range of common TDM measures and their suitability to Lexington. For both the commute and the non-commute trip, frequency and reliability of service were highly ranked.

### TDM Measures – Survey Results for Commute Trips

A total of 27 suggestions were made for discouraging single-occupancy vehicle commuting. Each member voted for five measures, assigning them a value between 1 (low priority) and 5 (high priority). The number of votes reflects how many committee members voted for the measure and the score reflects the total value assigned to the measure by the members voting on it. The top five suggestions by both frequency and priority are listed in Table 4. Other measures with one or more scores of “4” or “5” (the highest priorities) are listed in Table 5. Four of the top five measures suggest improvements to transit service; the fifth suggests more convenient ridesharing. While the top four measures are perhaps directed at mass transit, they also suggest improvements for paratransit services such as shuttle buses and vanpools.

**Table 4. Highest Scoring TDM Commute Trip Measures**

	Measure	Votes	Score
❖	Frequent service for flexibility	13	48
❖	Better access to transit	10	27

❖	Reliability	8	28
❖	Reasonable time	7	22
❖	Close carpooler	5	19

**Table 5. Other High Scoring Commute Trip Measures**

	Measure	Votes	Score
❖	Information about choices	5	15
❖	Public priority	4	15
❖	Increase in parking costs	5	14
❖	Door to door service	3	13
❖	Shower at work	5	11
❖	Transit link to commuter rail	4	9
❖	Safe bike route	4	9
❖	Financial incentive	3	8
❖	Employer leadership	2	7
❖	Regular work hours	3	6
❖	Control over own schedule	2	6
❖	Work at home	2	5
❖	Live closer to work	1	5

**TDM Measures – Survey Results for Non-Commute Trips**

A total of 15 suggestions were made for TDM measures related to non-commute trips (all trips other than trips to work). The measures with the most votes and highest scores are listed in Table 6. As with commute trips, there was a desire for more frequent transit service but there was also a focus on mixed land use to facilitate shorter, non-automotive trips. Other measures with one or more scores of “4” or “5” (the highest priorities) are listed in Table 7.

**Table 6. Highest Scoring TDM Non-Commute Trip Measures**

	Measure	Votes	Score
❖	Frequency of service	15	67
❖	Variety in town center	12	37
❖	Pick-up and delivery	10	28
❖	Live closer to shop and errands	8	26
❖	More/off-peak park and ride	6	26

**Table 7. Other High Scoring Non-Commute Trip Measures**

	Measures	Votes	Score
❖	Night service to entertainment	10	25
❖	Sunday Service	7	20
❖	Safety on the T	6	16
❖	Urban ring/circumferential transit	6	15
❖	Convenient and secure bike facilities	7	13

## Potential Actions

Based on the results of the exercise, existing TDM measures in Lexington, and the range of measures generally available, the following strategies and actions were recommended for implementation by the TEAC.

### ❖ Provide Information on Commuting Choices

A continuing theme with the TEAC was the need to educate the public, especially commuters, on the options available and the advantages of those options. This strategy focuses on helping commuters and others make informed decisions about their travel modes. **Included in Implementing Actions; Goal 2.C.3.**

- Work with the Transportation Coordinator and other officials, as well as private sources, to establish an effective and comprehensive marketing program utilizing:
 

1. Flyers	4. Information kiosks
2. Posters in the Town Center, Community Centers, Public Buildings, etc.	5. Posters in office lobbies
3. Transportation fairs	6. Flyers mailed with bills
	7. <i>Lexington Minuteman</i> or other newspapers
- Work with the Transportation Coordinator and other officials to enhance the Transportation section of the Town's Website. Provide all transportation measures and services in addition to LEXPRESS schedules and maps. Include links to other resources including MBTA, CARAVAN, the Route 128 Business Council, etc.

### ❖ Strengthen Article XII (Traffic) of the Zoning Bylaw

Article XII, (Art. XII, 135-71-73), while a commendable tool, is unclear as to the enforcement and monitoring of special permit conditions that are established under it. A revised policy would give the Town more 'teeth' vis-à-vis TDM, traffic mitigations, and private developers. **Included in Implementing Actions; Goal 2.C.1.**

### ❖ Support Carpooling

The emphasis in this strategy is to take immediate, low cost action to foster increased ridesharing. The actions build on existing efforts and focus on education and providing formal support for carpoolers. Many people reject carpooling because they perceive it as inconvenient, or are unaware of potential carpoolers in their area. Building on existing public and private programs to support carpooling extends scarce resources. One relatively new option is carsharing, which provides convenient, short-term rental of an automobile for subscribers. Rentals may be from anywhere between 30 minutes and 24 hours. Zipcar, a private company in the Boston, DC, and NYC areas, uses the internet to



manage rental of a network of cars stored at reserved parking places in urban neighborhoods and at transit stations. **Included in Implementing Actions; Goal 2.C.2.**

- Begin by incorporating and building upon existing local initiatives by the town of Lexington and private sources.
- Promote ridematching services offered by CARAVAN for Commuters and/or the Route 128 Business Council.
- Collect information, conduct outreach and implement marketing strategies.
- Seek financial incentives for carpoolers/vanpoolers.
- Serve both Lexington residents and Lexington employees.
- Explore options for carsharing programs such as Zipcar

#### ❖ **Provide Financial Incentives for Alternative Modes of Travel**

Other financial incentives to alter automobile use and shift to other modes of travel also exist. A few strategies are listed below. **Included in Implementing Actions; Goal 2.C.5.**

- Create a town-wide program that encourages alternative travel using credits and/or lotteries.
- Extend credits through employers or retail establishments to those who do not drive alone. Credits can be used for actual gifts or for a regular lottery drawing.
- Obtain gifts or lottery prizes from sponsors and from the Town. Should include transportation-related gifts including bicycles, sneakers, T-Passes, LEXPRESS tickets, gas coupons for carpoolers, etc.
- Have program work on an honor system with the disincentive for cheating being the advertising of the winners.
- Explore alternative sources of funds for financial incentives.

#### ❖ **Establish TMA Services**

Transportation Management Associations (TMAs) are alternative transportation implementing groups that take advantage of economies of scale among employers who wish to provide supportive service for commuters who do not drive. Employers contribute funds and provide other kinds of support (from office space to internet services) to a central organization, which in turn may provide ridematching services, run shuttle buses, organize a Guaranteed Ride Home<sup>3</sup> program, or distribute bicycle maps.

**Included in Implementing Actions; Goal 2.C.6**

- Encourage or mandate all employers (over a threshold number of employees) to join a TMA
- Encourage formation of Hartwell Avenue TMA to serve Hanscom Field, Hanscom AFB, and area businesses.

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<sup>3</sup> A Guaranteed Ride Home program ensures that employees will be able to get home even if they have to leave in the middle of the day or work late, thus missing a shuttle bus or carpool departure. Such services may be provided by taxi vouchers or an on-call paratransit service.

**❖ Provide Small-Scale Services in Office Parks**

This strategy focuses on providing opportunities to reduce the incidence of vehicular trips or eliminate the need to travel by car altogether and to allow travel needs to be served by walking. Some commuters may feel that they need to use their automobile during the workday. Providing a range of on-site or nearby options for lunches, dry cleaning, day care, and convenience shopping will remove one constraint to using alternative modes.

**Included in Implementing Actions; Goal 2.C.7.**

- Establish mixed use districts and associated zoning changes as a long-term measure.
- Encourage small businesses to use lunch trucks to bring lunch to the employees rather than employees going to lunch.
- Provide a number of trucks, offering a variety of cuisines, which visit a different office park or Town Center daily, providing variety to the employees.

**❖ Provide Incentives to Reduce Parking Demand (and Automobile Use)**

This strategy is aimed at providing financial incentives to reduce automobile use by focusing on paying commuters not to park instead of subsidizing their parking. One ‘hidden subsidy’ to SOV commuting is the provision of free parking. The employer nearly always pays the cost of obtaining land, constructing parking lots or garages, and maintaining them. If employees are given a choice of receiving this benefit in the form of a parking space, a significant cash payment, or other attractive benefit, they will have a further incentive not to drive. Restricting the total parking supply reinforces this incentive. In addition, Lexington’s regulations should be examined to ensure that they do not create unnecessarily large numbers of parking spaces. **Included in Implementing Actions; Goal 3.A.1 and Goal 3.A.2.**

- Establish a parking cash-out<sup>4</sup> program for employers.
- Explore Federal, State, or Local tax breaks or other sources of funds for reimbursing employers based on actual cash-back.
- Review minimum parking standards in the Zoning Bylaw

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<sup>4</sup> Parking cash-out refers both to a California state program and to a project under the Federal Commuter Choice program. Both establish standards for employers to offer employees a choice of cash or a free parking space.

	Retail Trips	Work Trips in Lexington	Work Trips outside Lexington (nearby communities)	Work Trips outside Lexington (Boston area)	Work Trips outside Lexington (outside 495)	School Trips	Other (tourist, recreational, etc.)	Work Trips (Non-Lexington Residents)
Car Sharing (e.g., ZipCar)	X						X	
Company car available during the day for work trips		X						X
Guaranteed Ride Home		X	X	X	X			X
Bike Discounts, Incentives, Facilities (showers/lockers)		X	X	X		X		X
Bike Lanes, paths, and Parking		X	X	X		X	X	X
Carpool/Vanpool Program		X	X	X	X	X		X
Schoolpool						X		
Priority parking (especially in Town Center)	X	X						
Convenience retail on site (residential and office)		X						X
Delivery services (retail) including online shopping	X							
Transit pass purchase (pre-tax)		X	X	X	X			X
Transit pass subsidy	X	X	X	X	X	X	X	X
Local hiring program		X						
Location efficient mortgages	X	X				X		
Local shuttle service (LEXPRESS) including night / weekend service	X	X				X	X	
Express buses and other transit services/links				X				X
Park & Ride facilities			X	X				
Site design	X	X				X	X	X
Mixed use and variety of services and retail	X	X				X	X	X
Graduated parking rates (town center vs. Satellite lots vs. office parks)	X	X					X	
Transit / TDM Information (booths, posters, marketing)	X	X	X	X	X	X	X	X
Financial Incentives	X	X	X	X	X	X	X	X

**Table 9: TDM Measures By Trip Type**

## BICYCLING AND WALKING

*An early-morning walk is a blessing for the whole day.* ~Henry David Thoreau

*A vigorous five-mile walk will do more good for an unhappy but otherwise healthy adult than all the medicine and psychology in the world.* ~Paul Dudley White

In addition to the land use changes described above that would foster walking and bicycling, the TEAC also considered improvements to sidewalks, walkways, and bicycle paths that would provide increased opportunities for walking and bicycling. The principal thrust of this was to consider incorporation of previous work of the Lexington Bicycle Advisory Committee into the Transportation Element, including the bicycle network plan and the sidewalk inventory developed by the committee. The element would support the further expansion of the Town's bicycle network and sidewalks consistent with the network plan and sidewalk inventory.

Development of formal on-road bike lanes and off-road trails is constrained in Lexington, as the Town is nearly built out. With this in mind, incremental infrastructure improvements, regulation, and educational programs are urged.

One excellent educational program is offered by Safe Routes to Schools, an international organization devoted to creating safe routes for children to walk or bicycle to school. Their aims are to increase children's health and fitness and decrease traffic congestion created by parents driving their children to school.

The group also considered several additional actions, including the following:

### ❖ **Confirm and Support Townwide Bicycle Network**

The existing network of routes, trails, and paths provides opportunities for recreational cycling, dog-walking, inline skating, a convenient way to get to work or school, or to provide the first or last leg of a multi-modal journey. There are many neighborhoods, however, which are 'land-locked' by busy intersections, highways, or conservation lands. The proposed additions to the network have been chosen to create pedestrian and bicycle-friendly links between neighborhoods, elementary schools, and major employment and shopping areas. **Included in Implementing Actions; Goals 2.B, 4.C, and 4.D.**

- Update bicycle route signage – The Lexington Bicycle Advisory Committee has recently completed an inventory of existing signing to allow for upgrading and expanding network signs.
- Develop “spot” improvement program – The network plan can be used to identify locations where specific physical improvements can be made to eliminate deficiencies in the network
- Incorporate bicycle “needs” in roadway projects – Roadway improvements should explicitly recognize and consider the needs of bicyclists.
- Use bicycle needs to help prioritize roadway improvement – Incorporating bicycle needs into roadway improvements should be a factor in establishing priorities for roadway improvements.

- Maintain synergy with neighboring communities – coordination with adjacent communities will allow for an integrated regional network.
- Encourage bicycle amenities (bike racks/lockers) at key locations – it is important to provide storage and other amenities to facilitate the use of bikeways.

#### ❖ **Adopt Townwide bicycle and sidewalk standards and policies**

Consistency in bicycle and pedestrian facilities is important both for safety and aesthetics. Sudden changes in the width or texture of a path or sidewalk could throw a user off balance, creating a potentially dangerous situation. A sidewalk that abruptly ends may force a pedestrian to walk on a busy road. Maintaining design consistency also creates a more aesthetically pleasing environment, in harmony with Lexington's existing character. **Included in Implementing Actions; Goals 2.B.7, 2.B.8**

- Write and adopt policy on the importance of creating and maintaining sidewalks for safety, health, and mobility
- Define standards for various bicycle facilities – Minimal standards should be established for various types of facilities to assure that no substandard segments of the network are created.
- Maintain consistency between facilities – establishment of minimum standards will provide for consistency between facilities of the same type and increase safety by removing sudden changes in quality of facilities.
- Enforce snow removal policies – where appropriate<sup>5</sup>, bicycle and pedestrian facilities should be kept clear of snow to facilitate year round use.

#### ❖ **Develop prioritization strategies for sidewalk improvements**

When planning sidewalk improvements, the prioritization system typically reflects the confluence of the physical condition of the sidewalk with its area or townwide importance as a pedestrian link. The Lexington Department of Public Works, in its annual capital budgeting process, employs a system that functions along these lines, but the methodology could be standardized for maximum consistency. The selection process also can be greatly aided by keeping the sidewalk inventory up-to-date and considering the impact of surrounding land uses and traffic conditions. **Included in Implementing Actions; Goals 4.C.2 and 4.C.3.**

- Update sidewalk inventory – The sidewalk inventory should be kept up-to-date to facilitate avoiding breaks in the network.
- Develop screening criteria – criteria should be developed for establishing what sidewalk improvements should be made.

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<sup>5</sup> There is some debate between clearing bike paths so that bicycle commuters can use them year-round, as opposed to leaving them snow-covered for cross-country skiing. A compromise may be possible, so that more isolated paths (which are less suitable for commuter use) are reserved for skiers and major paths cleared for other users. There needs to be dialogue around this issue, possibly with the Lexington Bicycle Advisory Committee playing a key role.

❖ **Vigorously implement the Town’s Transportation Demand Management Policy and Traffic Bylaw to support walking and bicycling in and around public and private development and redevelopment sites.**

When a property being developed meets the thresholds set by Article XII, Traffic, of the Zoning Bylaw, appropriate pedestrian and bicycle mitigations may be required, to the degree practicable. This is of benefit to both the town and the developer, as the former receives improved infrastructure and the latter is able to reduce the traffic impacts of the development. In addition, the marginal costs of constructing sidewalks, recreational trails, bike racks, or showers are relatively low. **Included in Implementing Actions; 2.B.2.**

❖ **Develop and implement zoning regulations to support and encourage walking and bicycling.**

Zoning and subdivision regulations govern the physical infrastructure that can either encourage or discourage walking and bicycling. In general, wider streets, a lack of sidewalks and crosswalks, and large building setbacks tend to make a ‘pedestrian-unfriendly’ environment. Compared to newer suburban communities, Lexington’s zoning bylaw is fairly supportive of alternative modes. Improvements could be made in many areas, however. Some examples are listed below. **Included in Implementing Actions; 2.B.8.**

- Require that bike lockers and showers be provided for employees in new commercial buildings over a certain size.
- Limit waivers for sidewalks in new construction.

❖ **Pursue 3E Programs (Education, Encouragement, Enforcement) in support of walking and bicycling.**

Education for drivers, cyclists, and pedestrians is a simple and inexpensive way to increase safety for all. Programs may be taught in schools, community centers, or other civic and social facilities. **Included in Implementing Actions; 2.D.2.**

❖ **Develop local Safe Routes to School program**

Safe Routes to School is an international program that works to develop safe walking and biking routes to elementary through high schools. The program is designed to both decrease traffic congestion and increase children’s health and fitness. **Included in Implementing Actions; 2.E.2.**

- Consider pilot program – establish a pilot program to test the feasibility and public acceptance of the program as a pilot for possible townwide adoption.

❖ **Keep informed of emerging technologies**

- In addition to these actions, the committee also discussed the potential for human transporters (i.e. the Segway) to impact the transportation system. While acknowledging the possibilities, the committee felt that the transporters are in an early stage of development and no consensus has emerged among experts as to an appropriate role for them in the transportation system. The committee agreed that the evolution of this invention should be monitored and appropriate actions should be included in updates of the plan when the functions of transporters become more clearly defined. **Not Designated for Inclusion in Implementing Actions.**

## LAND USE

Land use and transportation are incontrovertibly linked. The availability of transportation affects how land develops and the prevailing land use affects what transportation systems and services can be effective and where improvements will be situated. One common example of the relationship between land use and transportation is the highway interchange. When first built, interchanges were typically located in rural locations surrounded by large amounts of vacant land. The sudden increase in accessibility to these areas eventually made them desirable locations for shopping centers, office parks, and light industrial growth, as well as the sprawling subdivisions ringing the commercial nodes. The zoning that was put in place in mid-20<sup>th</sup> century America usually reinforced this pattern rather than controlling it.

In reaction to increasing traffic, longer commutes, and the sprawling development style that is largely dependent on the automobile, communities around the country have begun to reexamine their policies on land use and transportation. The typically rigid and land-consuming separation of residences from employment, commercial and institutional uses, induces the maximum use of automobiles. In response, some localities, in areas where it makes sense to do so, have begun to implement creative approaches to zoning that are more likely to mix uses, link to transit, and/or be designed so as to minimize traffic generation, by encouraging complementary changes in land use. The effects of such regulatory strategies are very gradual and incremental, but they should not be ignored as a component in the transportation tool kit.

Highway interchanges are only one type of location where changes in land use policy might be considered. Another example is offered by the central business district, where the zoning could be changed to allow apartments on the upper stories of commercial buildings, thus providing built-in customers and placing those people where there is transit. A third hypothetical location might involve modernizing the list of allowed home occupations, to remove commuters from local streets. A fourth would be to liberalize the creation of small-scale commercial service and food businesses in districts where the land use is predominantly large scale office or research and development use, for the purpose of reducing mid-day car trips or to minimize the incentive to bring an automobile to work in the first place.

Other types of land use policies that impact transportation might involve community improvement programs, accompanied by modifications to design standards, such as street widths, setbacks, sidewalks, parking lots, and density, all of which have an effect on the 'walkability' of a place. Lexington Center, with its mix of commercial uses, wide sidewalks, pedestrian amenities, frequent crosswalks, and traffic-calming design, is often bustling with pedestrians and cyclists. Hartwell Avenue, by contrast, with extremely high traffic volumes, no sidewalks, and deep building setbacks, is clearly auto-dominated.

Under any circumstance, it is important to see the retrofitting of land use at certain nodes or locations as a secondary transportation and planning tool, one that helps only over time and in a modest way. This is due to the fact that Lexington is a mostly built-out community, a mature suburb where the development patterns are largely established, in contrast to more outlying localities that are only partially developed and where growth might often occur at a more



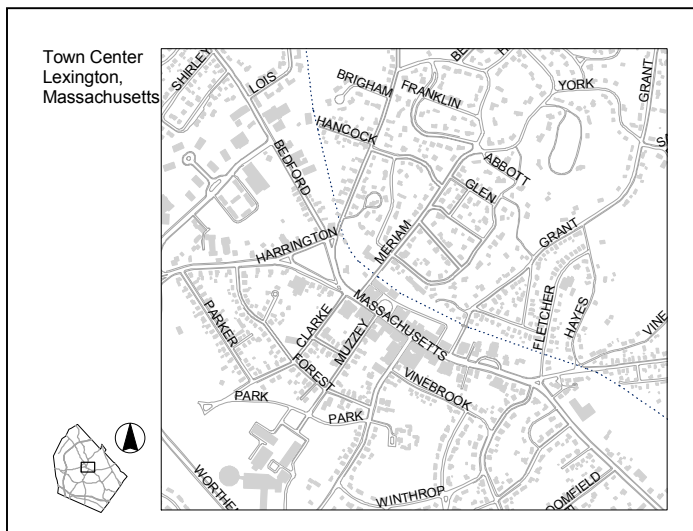
sweeping scale. The objectives with these kinds of land use/transportation strategies are more modest for an established community.

Further, any policies of this type that are considered for Lexington must be bound by some precautions. Smallness of scale and compatibility with neighborhood character must be primary considerations, and the link to transportation objectives must be present. The proposed changes must be acceptable to those in the vicinity and to the community and seen as a benefit.

The Transportation Element planning process considered several actions involving land use decisions that would support the goal of providing alternatives to driving alone. These actions involve encouraging a mix of uses within certain nodes to reduce the need to travel by automobile and allow greater use of walking, bicycling, transit, or TDM measures such as ridesharing. Eight land use nodes were identified as locations where greater mixing of uses would be both desirable and possible. The TEAC incorporated recommended land use changes in each of these areas in the Implementing Actions for the plan. Descriptions of these areas and potential actions are described in the sections that follow.

## LAND USE NODES

### Town Center



**Map 7:**  
**Town Center**  
**Locus Map**

### Issues/Observations

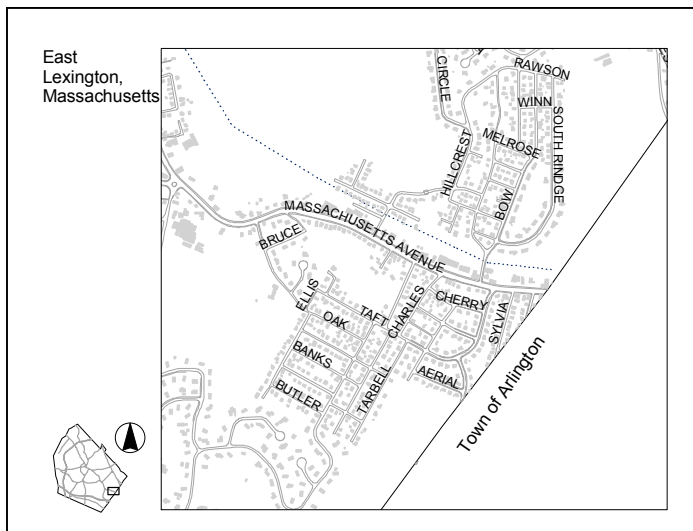
- Follows traditional New England town center form (scale, uses, etc.).
- Local and regional attractions (shopping, bikeway, restaurants, theater, historic sites)
- Multi-modal village:
  - LEXPRESS transfer point at Depot Square
  - MBTA bus routes
  - Minuteman bike trail
  - Extensive sidewalks
  - Parking
- Traffic congestion.

- Lack of appropriate parking for tour buses

#### Potential Actions

- Establish housing as an allowed use in upper stories. Pursue this initiative in the next year or two, because it will be years before the resultant market activity actually has an impact. **Included in Implementing Actions; Goal 6.C.**
- Introduction of new residential uses may require expansion of parking. Consider benefits of structured parking as a catalyst for residential use and for the Center in general **Included in Implementing Actions; Goal 6.C.**
- Consider creating a Business Improvement District to address transportation and parking issues, among others. **Included in Implementing Actions; Goal 6.A.2.**

#### East Lexington (Massachusetts Avenue)



**Map 8:  
East Lexington  
Locus Map**

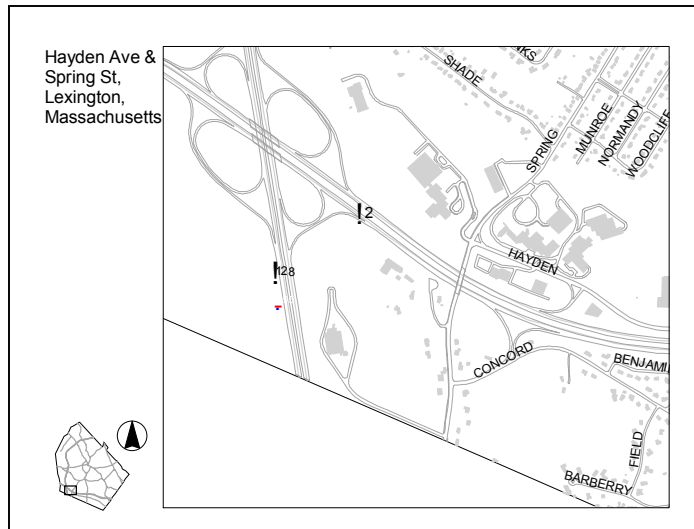
#### Issues/Observations

- Offers more urban character than most of Lexington.
- On MBTA and LEXPRESS bus routes

#### Potential Action

- Encourage housing as an allowed use in upper stories. **Included in Implementing Actions; Goal 6.A.6.**

## Hayden Avenue and Spring Street



**Map 9:  
Hayden and Spring  
Locus Map**

### Issues/Observations

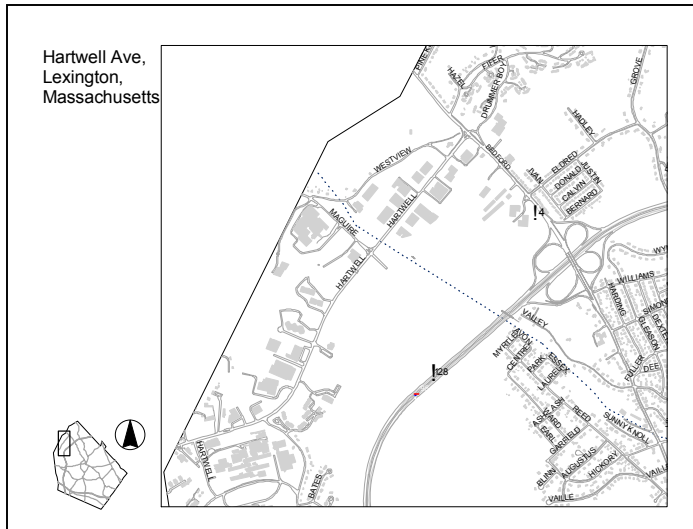
- Range of density and intensity along Hayden/Spring (high) and Spring Street (low).
- Large front setbacks along Spring Street; variable setbacks along Hayden/Spring.
- Automobile focused.
- Lacks sidewalks.
- Dominated by two large corporate uses (Raytheon, Stride Rite).
- Address future of Raytheon parcel (6 of 96 acres zoned residential)
- Route 128 Shuttle Bus to Alewife Red Line station.
- Served by LEXPRESS.
- No MBTA bus service.

### Potential Actions

- Retrofit with non-automotive infrastructure: **Included in Implementing Actions; Goal 6.A.3.**
  - Provide multi-purpose trails for pedestrians and bikes
  - Reduce front setbacks, both by way of zoning and physical retrofitting to allow for transit, TDM and pedestrian facilities.
  - Orient building entrances to street
  - Provide bus pullouts and shelters
- Establish a mixed-use node along Spring Street and Hayden/Spring tied to CD rezoning process and traffic mitigation (via Overlay District as a regulatory incentive or enhanced base zoning). There is a generally more land area along Spring Street to accommodate mixed development than along Hayden/Spring. **Not specifically identified in Implementing Actions but is suggested by Goal 6.A.4.**

- Plan for near-term future of Raytheon parcel: potential for mixed-use development (office, limited commercial, conservation/recreation and housing). Consider cohesive mixed-use development approach. **Included in Implementing Actions; Goal 6.A.1.**
- Plan for long-term future of Stride Rite parcel: mixed use with or without housing. Consider cohesive mixed-use development approach. **Included in Implementing Actions; Goal 6.A.8.**

## Hartwell Avenue



**Map 10:**  
**Hartwell Avenue**  
**Locus Map**

## Issues/Observations

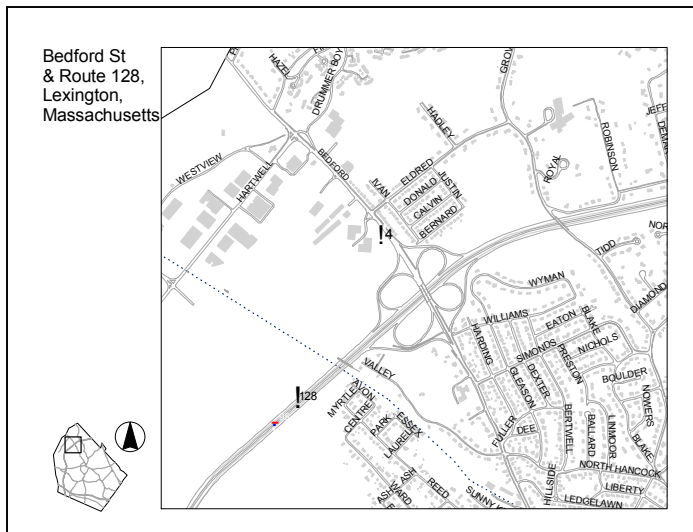
- Low density, automobile focused development area.
- Large front setbacks from street.
- Lacks sidewalks.
- Significant employment area (over 2,000 employees have addresses along Hartwell Avenue, plus additional employees on Wood Street, Hanscom AFB, Hanscom Field).
- Lack of transit service to the area (No LEXPRESS service, no MBTA service, except on Saturday)

## Potential Actions

- Retrofit with non-automotive infrastructure: **Included in Implementing Actions; Goal 6.A.3.**
  - Provide multi-purpose trails for pedestrians and bikes
  - Reduce front setbacks
  - Orient building entrances to street
  - Provide bus pullouts and shelters
  - Provide for on-site multi-passenger vehicle drop-off/pickup areas at individual businesses.

- Provide improvements possibly by means of a betterment district along the length of Hartwell Avenue and Maguire Road. **Included in Implementing Actions; Goal 6.A.3.**
- Create an Overlay District that allows a modest floor area ratio (FAR) increase if tied to a commitment for an overall TDM strategy. Allow small density increases with mitigation tied to transportation improvements (i.e., TDM, fixing the Bedford Street/Hartwell Avenue jug handle intersection, etc.). **Included in Implementing Actions; Goal 6.A.3.**
- As an alternative or complementary policy, businesses wanting to add space along Hartwell Avenue would be required to pay a fee that goes towards a fund dedicated to implementing transit programs and/or infrastructure improvements along Hartwell Avenue. **Included in Implementing Actions; Goal 6.A.3.**
- Allow secondary commercial uses (day care, restaurant, small service businesses, etc.) to create synergy between employers and service-type uses and to reduce auto trips. **Included in Implementing Actions; Goal 6.A.4.**

**Bedford Street/Route 128**



**Map 11:  
Bedford and 128  
Locus Map**

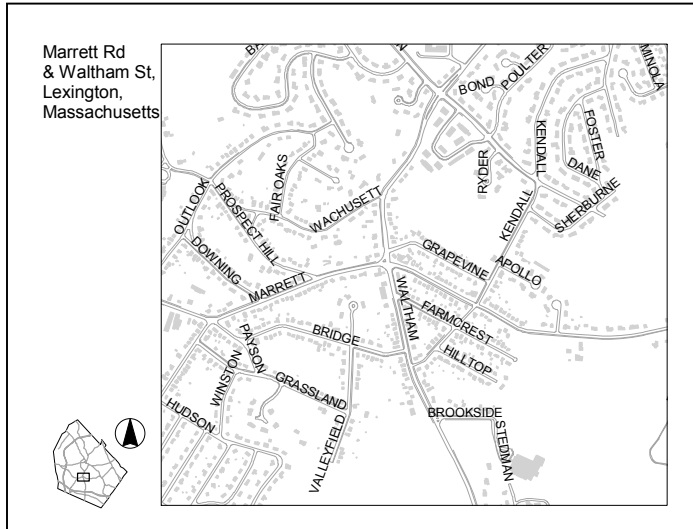
**Issues/Observations**

- Excellent regional highway access.
- Significantly underdeveloped, given location and access.
- Area of significant untapped potential.
- Served by MBTA bus
- No LEXPRESS service

Potential Action

- Promote greater use intensity, if town chooses to take such action for economic development/tax base enhancement purposes. **Included in Implementing Actions; Goal 6.A.7.**

**Marrett Road (Route 2A)/Waltham Street**



**Map 12:  
Marrett and  
Waltham  
Locus Map**

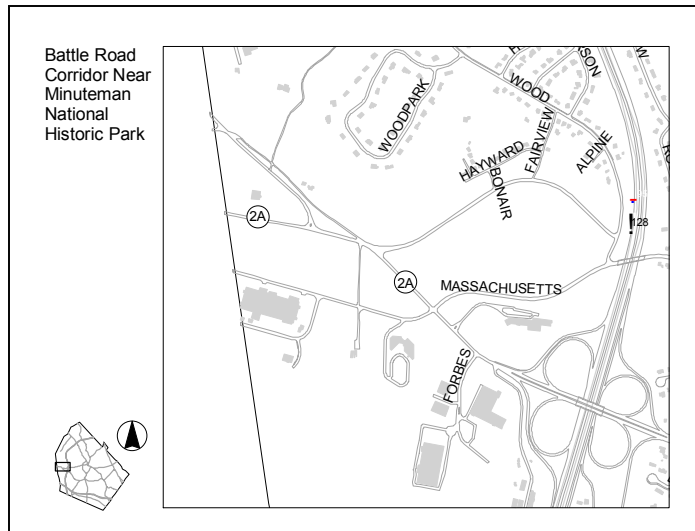
Issues/Observations

- Automobile-oriented retail node (Dunkin Donuts, gas station, etc.)
- Poorly functioning parking/circulation pattern.
- Traffic congestion – intersection improvement planned.
- Served by MBTA and LEXPRESS transit.

Potential Action

- Implement physical access improvements to reduce direct access to parking spaces from street. **Included in Implementing Actions; Goal 4.B.3.1.**

## Battle Rd/2A Corridor



**Map 13:**  
**Battle Rd/2A**  
**Locus Map**

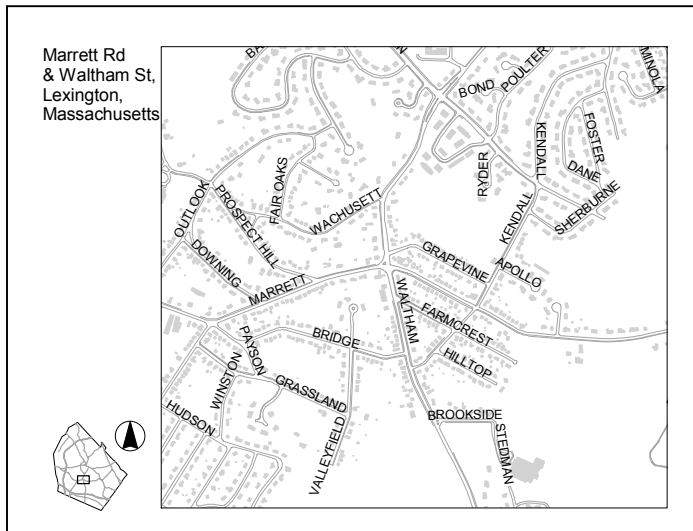
### Issues/Observations

- Heavy through-traffic volumes
- Significant traffic to/from Massport-Hanscom AFB
- Possible expansion of existing commercial development (hotel, office park, Minuteman Voc-Tech)
- Popular with cyclists

### Potential Actions

- Support National Park Service efforts to provide alternative transportation, particularly a corridor shuttle bus. **Not Designated for Inclusion in Implementing Actions; recommended for future consideration**
- Monitor development proposals and resultant traffic impact at Massport/Hanscom, coordinate responses and negotiation with other underlying towns. **Included in Implementing Actions; Goal 5.B.**
- Monitor trip generation impacts of proposed developments in area. **Included in Implementing Actions; Goal 5.A.2.**

## Countryside (Lowell Street/Woburn Street)



**Map 14:**  
**Countryside**  
**Locus Map**

### Issues/Observations

- Limited retail development area, with some office and abutting attached housing.
- On LEXPRESS route.

### Potential Action

- On a small-scale basis create more uniform zoning pattern, with regulatory incentives to have more campus and less strip-mall development over time. **Not designated for inclusion in Implementing Actions.**

### Land Use Measures Applying Townwide (no specific geographic location)

The following measures were discussed in the transportation planning process as land use actions that might have a long term positive impact on traffic management:

- Modernize Allowed Home Occupations in Zoning Bylaw, to encompass contemporary home based business types and technology. **Included in Implementing Actions; Goal 6.B.**
- Study the viability of a regulatory amendment linking the floor area entitlement in large scale commercial development to traffic trip generation, with the possible outcome of establishing formulae specific to relevant zoning districts. **Not designated for inclusion in Implementing Actions.**

### Other Upcoming Land Use Issues



**201 Bedford Street:** Now occupied by the Public Works Department, a town-solicited concept proposal to sell the site, move the department to its Hartwell Avenue property, and develop 201 for mixed income housing and a new town senior center, was recently debated at town meeting. The nature of a senior center is such that accessibility for all seniors, whether they can drive or not, is important to its operation. The 201 Bedford St site is located on an MBTA bus line, LEXPRESS Route 4, and is near the Route 128 interchange. Bedford St itself has sidewalks, but they are less common in surrounding neighborhoods.