The Lexington We Want

Transportation Element

Project History And Context

Existing Conditions

Strategies

Implementing Actions

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Update

On June 2, 2003, a special election was held to determine whether the citizens would approve an override of Proposition 21/2. The override did not pass, with the result that funding for the LEXPRESS in-town bus service and the position of Transportation Coordinator was eliminated. This has drastically changed the range of transportation services available for fiscal year 2004 and will delay the implementation of recommended strategies. This Transportation Element is part of a long-range (20-year) plan and is being published with the assumption that this funding will be restored in the future, at least in some form. This occurrence in no way invalidates the substantive content of this document and its proposed implementation actions. On the contrary, the plan, as produced, stands as a signpost for where the town needs to be to begin meaningful transportation mitigation.

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Glossary of Terms & Acronyms

Betterment District - A betterment offers a means for the municipality to be reimbursed for the cost of constructing capital improvements in the infrastructure, particularly those of a linear nature, such as a street, sidewalk, sewer or water line. Abutting private properties, each in their fair share, are assessed payments on some kind of regular schedule.

BID - Business Improvement District

CARAVAN for Commuters – A statewide commuter services organization funded by MassHighway and the Federal Highway Administration

Carsharing – A program that allows for short-term rental of a distributed network of automobiles, usually on a membership basis.

Channelization – A traffic planning term referring to the separation of turn lanes from through lanes by traffic islands or pavement markings.

CTPS – Central Transportation Planning Staff – A technical and policy-analysis group for Boston Metropolitan area transportation planning

DPW – Department of Public Works

FAR – Floor-Area-Ratio – A measure of density that compares the total square footage of a building to the size of its lot.

Guaranteed Ride Home - 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.

HATS – Hanscom Area Towns Committee – A committee comprised of four members from each of Hanscom's four abutting towns: Concord, Bedford, Lincoln, and Lexington.

LOS – Level of Service – A measure of traffic volumes by the road's capacity used in traffic planning. LOS ranges from A to F, with F being failure. An LOS of A or B is not desirable, as it indicates that the road has excessive capacity for the volume of traffic that it serves.

LBAC – Lexington Bicycle Advisory Committee

MAGIC – Minuteman Advisory Group on Interlocal Coordination – Lexington's MAPC subregion

MAPC – Metropolitan Area Planning Council – The regional planning agency for the Boston Metropolitan Area
MPO – Metropolitan Planning Organization – The regional transportation planning agency for the Boston Metropolitan area, established to carry out federally funded plans and programs

Neckdown – Reduced lane width at intersections or mid-block crossings to facilitate pedestrian movement and safety. Also known as bulb-out or curb extension.

Overlay District – a zoning district that adds an additional layer of land use controls without replacing the underlying zoning. The overlay may or may not be contiguous with preexisting zoning districts.

Paratransit – 'Paratransit' covers a range of services which fall somewhere between public transportation and private transportation. Paratransit services typically do not have a fixed route or schedule and include taxis, dial-a-ride, jitneys and others.

PUD – Planned Unit Development

SOV – Single Occupancy Vehicle

SPGA – Special Permit Granting Authority

TEAC – Transportation Element Advisory Committee

TDM – Transportation Demand Management

TMA/TMO – Transportation Management Association / Organization

Traffic Calming – A method of using physical infrastructure to moderate driver behavior

Traffic Platform – A traffic calming device. Similar to a speed bump, but significantly wider, a traffic platform both calms traffic and causes less damage to automobiles than traditional speed bumps.

VMT – Vehicle Miles Traveled

ZBA – Zoning Board of Appeals



Executive Summary

INTRODUCTION

This document is the sixth element in the Town of Lexington's Comprehensive Plan, produced by the Planning Board in the past 2 ½ years. The previously adopted elements as defined by the state planning statutes (section 81D of Chapter 41 of the MA General Laws) include: Land use, Natural and Cultural Resources, Housing, Economic Development and a detailed Implementation plan that integrates the preceding elements.
This document can stand on its own, however, as a long range transportation policy plan for the community.

The Transportation Element was accompanied by extensive and broad-based public participation, in the form of the Transportation Element Advisory Committee (TEAC), which included citizens, public officials and key committee members, relevant town employees, representatives of business, various guests, and the Planning Board. Working with the consulting team from Vanasse Hangen Brustlin (VHB), staff organized five structured workshops focusing on the transportation modes, between September 2002 and January, 2003. Following this, the TEAC had extensive input into the actual drafting of the document.

This document is structured around and driven by goals and objectives pertaining to the broad issues of quality of life and public services and facilities. These goals and objectives were articulated in three sources: 1) the previous elements of the Comprehensive Plan; 2) the Selectmen's Vision 2020 project that preceded it; and 3) modifications to the preceding from the TEAC, emanating from the public participation process.

The Vision for Alternative Transportation

It is important at the outset to understand the inspiration and assumptions for this document. It is emphatically not a study for upgrading the town's street and highway system, although some infrastructure improvement is unavoidable over time. Instead, it is an attempt to identify and think through feasible implementation measures that will offer a real alternative in the coming years and decades to relentless automobile dependency. The following is an excerpt from the 2002 Request for Proposals for the consulting services that were employed to assist this project:

The issue of traffic and its impact on the quality of life in Lexington is not a new concern. It is merely a worsening one here, and nearly everywhere else in populous regions. The hope in

establishing a transportation element is to make available policies, programs and regulations that can provide transportation alternatives (to single occupancy vehicular trips) which, if implemented extensively enough over time, can improve the quality of life by reducing vehicular trips to at least a discernible degree The transportation element (is intended) *to be a document that explores aspects of how Lexington can help to shape its future…A (Transportation Element) will require a truly regional approach, as traffic does not begin and end at Lexington's borders, but rather, is the result of a complex network of people traveling to and from work, to and from schools and shops, as well as those passing through Lexington on longer trips….This element should propose bold but feasible implementing measures that start from the premise that traffic difficulties do nothing to improve the community's well being, benefiting neither the environment, the economy, public safety, family life or efficiency of people circulation, and that this reality is both local and regional in nature.*

EXISTING CONDITIONS

The consultants and planning staff gathered data from the US Census, MassHighway, the Lexington Police Department, the MBTA and other sources, and conducted interviews with relevant officials, committees, and interested parties. The results were analyzed to gain an understanding of the present status of transportation service and infrastructure in Lexington today. This data forms the basis of the strategies and actions proposed in following chapters and summarized at the end of this section.

Traffic Patterns

Lexington is predominantly a residential community with pockets of retail, office, and light industrial development. Major sources of traffic generation in Lexington include the Town Center, Hartwell Avenue, and Hayden Avenue/Spring Street employment centers, public schools, the Minuteman National Historical Park, and the Lexington Battle Green historic area. Of Lexington residents who are working, approximately 24% work in Lexington, with the result that more than 75% commute to jobs outside of the town.

Lexingtonians have the option to travel by walking, biking, local or regional bus, paratransit, or taxi. The predominant means of transportation in Lexington, however, is the private automobile. This is increasingly the case throughout the country; the number of vehicles miles traveled by passenger car in the United States rose 12% during the 1990s.[1] Automobile ownership has increased as well: 24% of households now have more vehicles than licensed drivers.[2] The result is clear: approximately 80% of Lexingtonians commute to work, whether within or beyond Lexington's borders, by driving alone.

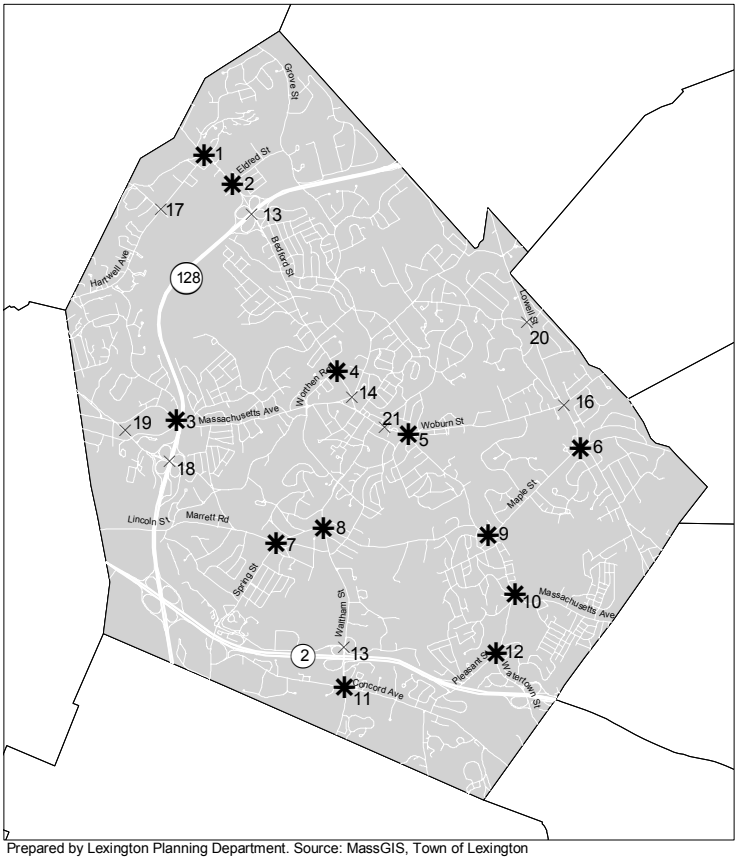
Roadway Network

The town is located at the intersection of two major limited access regional highways: the I-95/Route 128 circumferential highway and Route 2, a major radial highway emanating from

[1] Bureau of Transportation Statistics: "National Transportation Statistics 2002"
[2] 2001 National Household Transportation Survey

Boston. Other state-numbered roadways through town include Route 2A and Routes 4/225. Route 2A is a generally east-west route connecting Arlington to Lincoln. It follows Summer Street, Lowell Street, Maple Street, Marrett Road, and Massachusetts Avenue. Route 4/225 runs between Route 2 near the Arlington town line and I-95/Route 128 and the Town of Bedford. It follows Watertown Street, Pleasant Street, Massachusetts Avenue, and Bedford Street. Massachusetts Avenue, which begins in Boston and continues out towards Central Massachusetts, functions in Lexington as the town's main street.

Various traffic data were analyzed to produce a list of intersections to be studied for improvement. Data sources included accident records, recent traffic studies for individual development projects and conversations with the Department of Public Works regarding operating conditions, including congestion, delay, queuing and levels of service. Proposed improvements were later debated in public meetings; those that were advanced for inclusion in the plan appear at the end of the 'implementing actions' summary below.



Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington

Map 2. Problem Intersections Analyzed

1. Bedford St and Hartwell Ave
2. Bedford St and Eldred St
3. Mass Ave/Old Mass Ave/Wood St
4. Bedford St and Worthen Rd
5. Mass Ave and Woburn Rd
6. Maple St and Lowell St
7. Spring St and Marrett Rd
8. Waltham St and Marrett Rd
9. Maple St and Mass Ave
10. Mass Ave and Pleasant St
11. Waltham St and Concord Ave
12. Pleasant St and Watertown St
13. Bedford St at Rte 128
14. Bedford St at Harrington Rd and Hancock St
15. Waltham St and Hayden Ave
16. Lowell St and Woburn St
17. Hartwell Ave and Maguire Rd
18. Marrett Rd at Rte 128
19. Mass Ave/Old Mass Ave/Marrett Rd
20. Lowell St and East St
21. Mass Ave and Grant St

Legend

Study Intersections

proposed improvements

analyzed, no improvements proposed

2000 0 2000 4000 Feet

Transit

Lexington's transit service consists of MBTA intercity bus service (via Route 62/76), the LEXPRESS in-town bus service, some demand-responsive van services for the elderly and disabled, and a commuter shuttle operated by the 128 Business Council, a transportation

management association. Of these, MBTA Route 62/76 carries by far the highest number of passengers. LEXPRESS attracts fewer riders in total, but carries a large number of Lexington's youth and elderly.

While Lexington has a number of options for a town of its size and population density, the existing transit network is limited in its usefulness. LEXPRESS ends operations by 7:00 P.M. at the latest on weekdays, which is a handicap in attracting commuters who keep irregular hours. The relative infrequency of transit service during the hours in which it operates further reduces its attractiveness. Another limitation is the lack of Sunday service by any public transportation provider in the area. Most residents cannot depend wholly on existing public transit and maintain their current quality of life. For those who cannot or do not wish to drive, however, the existing public transit system is immensely valuable.

Transportation Demand Management

Transportation Demand Management (TDM) is a set of policies and strategies that focus on the reduction of transportation demand and the provision of alternative means of travel to driving alone in a car. Lexington has both a Transportation Demand Management Bylaw and Policy, which provide developers with the option of creating a TDM plan as a mitigation for negative traffic impacts of a development. Many fulfill this condition by joining the 128 Business Council, a Transportation Management Association serving the Route 128 area. The 128 Business Council operates the Alewife Shuttle, which is an employer-subsidized shuttle from the MBTA Red Line Alewife station to offices on Hayden Avenue and Spring Street.

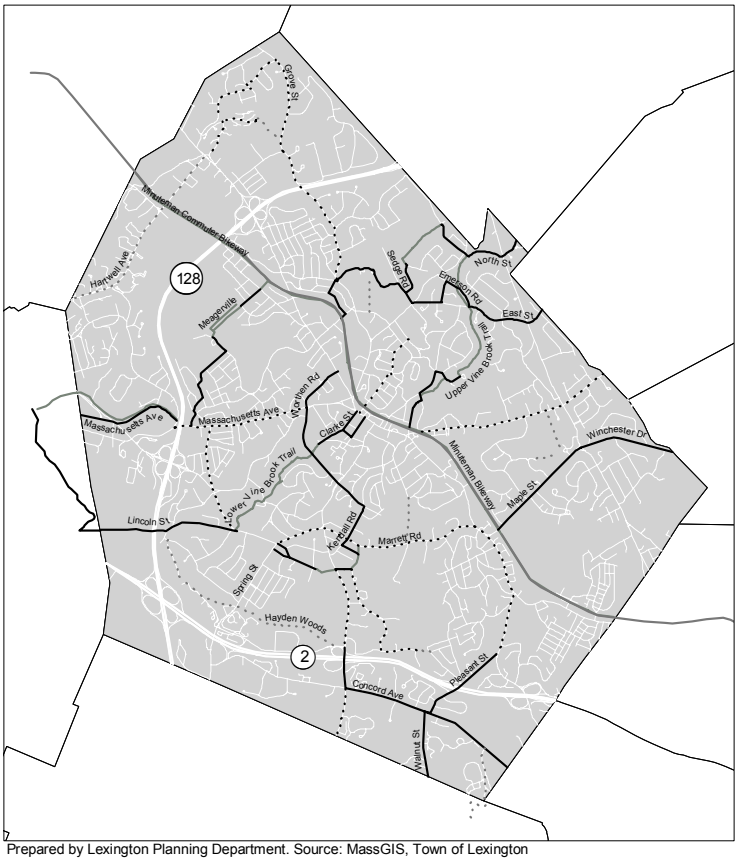
The Lexington Transportation Coordinator heads local TDM efforts, as well as coordinating LEXPRESS, municipal parking, and paratransit service. Since 1996, Transportation Coordinators have made three attempts to establish a TMA on Hartwell Avenue area. The most recent effort began in the autumn of 2001 and continues. Current Hartwell TMA planning is a joint effort of the Transportation Coordinator, Economic Development Officer, and the 128 Business Council.

Walking and Bicycling

Lexington has a network of bicycle trails and designated routes and sidewalks that facilitate bicycling and walking not only as a form of recreation but also as a mode of travel. These modes not only function as environmentally and health-friendly transportation options in their own right, but also facilitate the use of public transportation. The Town is fortunate to have the Lexington Bicycle Advisory Committee (LBAC), which has done much to expand the bicycle network and inventory the sidewalk network. More generally it provides active support and encouragement of bicycle use and walking.

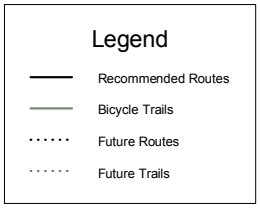
The existing bicycle network is divided into off-road bicycle trails and on-road recommended routes. The latter are generally, but not always, marked with road signs. Recommended routes are judged to be both relatively convenient to major destinations and fairly safe, although caution is urged at all times. Bicycle trails are generally on town-owned land or easements through private land and offer access to recreational facilities and open space.

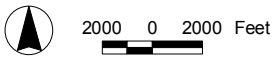
The most well known bicycle facility in the community is the Minuteman Commuter Bikeway which runs generally north of, and parallel to, Massachusetts Avenue through much of the town. The Bikeway is a production of the Rails to Trails program and follows the former B & M rail corridor.



Map 4.
Bike Routes and Trails, Existing and Proposed.

'Recommended Routes' are roads which are recommended for cyclists, while 'Bicycle Trails' are off-road paths generally closed to motorized vehicles. Many links in the proposed network do not yet exist.





Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington

Sidewalks are concentrated in the town center and nearby neighborhoods and adjacent to public schools. The presence of sidewalks in other areas is less uniform with some lower density residential areas having few if any sidewalks.

IMPLEMENTATION

Analysis of the existing conditions led to the proposal of a slate of implementation measures, which constitute the body of the plan. The measures that are included were selected after debate by the TEAC.

Implementation of the recommended measures over a considerable period of years is entirely a function of the collective will of all the "actors" involved with these issues. Their willingness to focus on these complex but important policies and to devote time and resources to them will determine if significant parts of the Element are implemented. There is no single entity, whether the Planning Board, Transportation Coordinator, Transportation Advisory Committee, Traffic

Safety Advisory Committee, Public Works Department, Board of Selectmen, the business community, or whomever, that possesses sufficient capacity, authority and resources to carry this effort forward unilaterally. It will take a determined cooperative effort to achieve some success.

Below is an abbreviated summary of the implementing actions proposed by the TEAC. Actions are assigned to primary and secondary implementers, as well as to one of four timeframes – Ongoing, Near Term, Intermediate Term, or Long Term. As intersection improvements are numerous, they appear separately at the end of the section. A list of designated actors follows for reference purposes. In the full document, all relevant actors are assigned to specific implementation measures.

Designated Actors

Board of Selectmen	Economic Development Officer
Planning Board	Lexington Bicycle Advisory Committee
Board of Health	Traffic Safety Advisory Committee
Zoning Board of Appeals	Transportation Advisory Committee
128 Business Council	Historic Districts Commission
Town Manager	Design Advisory Committee
HATS	Capital Budget Committee
MPO Representative	Transportation Coordinator
Business Community	Department of Public Works
School Committee	MAGIC Representative

Implementation Time Frames

Category	Ongoing	Near Term (NT)	Intermediate Term (IT)	Long Term (LT)
Difficulty	Varies	Least Constraint	Medium Constraint	High Constraint
Initiating Time Frame	Continuous	1-2 years	2-5 years	5+ years
Cost	Varies	Low	Medium	High

Ongoing

- Seek easements from public and private landowners to extend bicycle and pedestrian facilities.
- Rigorously implement the Town's TDM Policy and Article XII, Traffic, of the Zoning Bylaw.
- Promote use of LEXPRESS for transportation from after-school activities
- Maintain consistency in pedestrian and bicycle facilities
- Enforce snow removal policies
- Incorporate bicycle needs and priorities in roadway projects

- Coordinate with Boston MPO and MPO Advisory Committee to monitor regional projects.
- Monitor Hanscom/Massport transportation impacts
- Communicate directly with abutting towns on traffic aspects of developments of regional impact
- Participate in MAGIC's regional transportation planning efforts

Near Term

- Initiate limited bus service between Hartwell Avenue and the Lowell Commuter Rail Line at Anderson RTC in Woburn.
- Initiate bus service between Waltham Center and Lexington Center to access the Fitchburg Commuter Rail Line
- Incorporate bicycle route plan in Comprehensive Plan and update regularly
- Update bicycle route signage
- Encourage pedestrian and bicycle amenities at key locations
- Identify satellite 'park and bike' locations
- Define flexible standards for bicycle and pedestrian facilities that respect community character
- Develop and implement zoning regulations to support walking and bicycling
- Review and revise Article XII of the Zoning Bylaw for better enforcement and monitoring
- Support carpooling by Lexington residents and by employees working in Lexington
- Provide information on alternative commuting choices.
- Work with other officials to enhance the transportation section of the Town's website
- Provide small-scale services in office parks
- Pursue an education, encouragement, and enforcement program for students and the larger community in walking and biking
- Implement a pilot Safe Routes to School program
- Investigate feasibility of providing incentives for students to commute by walking, biking, bus, or carpool
- Initiate planning for long-term roadway improvements at the intersections of Marrett Road and Waltham Street and Bedford Street and Hartwell Avenue.
- Write and adopt policy on importance of creating and maintaining sidewalks for safety, health, and mobility.
- Update and maintain sidewalk inventory
- Develop prioritization strategies and screening criteria for sidewalk improvements
- Plan for the future of the former Raytheon site (141 Spring St).

Intermediate Term

- Investigate feasibility of extending the hours of operation and increasing frequency of service of LEXPRESS.
- Provide incentives for alternative modes of travel
- Establish TMA services; assist employers in joining existing and new TMA's.

- Investigate providing improvements by means of a betterment district along the length of Hartwell Avenue
- Study existing parking regulations to assess impact on transportation choice
- Provide incentives to reduce parking demand and automobile use
- Consider identifying criteria for roadways where sidewalks may be constructed on only one side
- Create Task Force to study a retrofit of Hayden Avenue and the commercial areas of Spring Street and Hartwell Avenue with non-automotive infrastructure
- Consider creating a Business Improvement District to address transportation and parking issues in the Town Center
- Create an Overlay District in Hartwell Avenue that ties density to traffic management
- Allow small-scale, service-oriented commercial uses in office parks
- Investigate feasibility of establishing mixed-use development at commercial nodes.
- Encourage transit and pedestrian-friendly redevelopment in East Lexington along the Massachusetts Avenue commercial corridor
- Promote greater use intensity at the commercial node on Bedford Street north of Route 128
- Plan for the future of the StrideRite site (191 Spring Street)
- Initiate revision of home occupation permitted uses in the Zoning Bylaw
- Initiate action to establish housing as an allowed use in upper stories in the Town Center and East Lexington.

Long Term

- Initiate bus service between Winchester Center (Lowell Commuter Rail Line) and Lexington center; connect to MBTA routes.
- Advocate for extension of MBTA bus route #78 to Hayden Avenue and route # 77 to Lexington Center
- Advocate for increase in frequency of service on MBTA bus routes in Lexington.

INTERSECTION IMPROVEMENTS

Near Term

Hartwell Avenue and Bedford Street

- Modify the traffic signal phasing to provide separate phases for the eastbound Hartwell Avenue and westbound Bedford Street jughandle approaches.
- Allow right turns from the southbound jughandle approach.

Waltham Street and Marrett Road

Install a "Yield" sign at the channelized right turn on southbound Waltham Street.

Maple Street and Lowell Street

- Paint gore (zebra) striping around the islands with signal posts to better delineate the islands
- Paint a left-turn lane on Maple Street (lane is already in operation).

Worthen Road and Bedford Street

- Paint a crosswalk across Camelia Drive (sidewalk and ramps already in place).

Intermediate Term

Marrett Road at Waltham Street

- Consolidate driveway access at Gulf Station on southwest corner and provide sidewalk.
- Install signal ahead sign on southbound Waltham Street due to limited sight distance.

Maple Street at Lowell Street

- Upgrade signal equipment to provide protected left-turn phasing on northbound Lowell Street approach and pedestrian crossings.
- Upgrade pedestrian crossings to be ADA-compliant.

Concord Avenue at Waltham Street

- Upgrade signal equipment to provide protected left-turn phases on Waltham Street.

Spring Street at Marrett Road

- Install an island on northbound Spring Street to better channelize vehicles entering and exiting Spring Street.
- Extend northwest corner of Spring Street to reduce the width of eastbound Marrett Road and to improve channelization.
- Extend curb from one-way Bridge Street toward Marrett Road to reduce the amount of pavement and to better channelize vehicles.
- Investigate the feasibility of providing a separate left-turn lane on westbound Marrett Street within the existing right-of-way.

Worthen Road at Bedford Street

- Provide an exclusive left-turn lane on northbound Bedford Street.

Massachusetts Avenue at Woburn Street/Winthrop Street

- Install bulb-out on Woburn Street to reduce amount of pavement at the intersection and to slow and better channelize vehicles exiting Woburn Street onto Massachusetts Avenue.

Extend island westward to prohibit vehicles from crossing

Long Term

Bedford Street at Hartwell Avenue

- Widen the jughandle approach to provide three lanes (a shared left-turn/through lane, a through lane, and a shared through/right-turn lane).
- Widen the Hartwell Avenue approach to four lanes (two exclusive left-turn lanes and two exclusive right-turn lanes)
- Widen the Bedford Street approaches to two full lanes in each direction.
- Upgrade traffic signal equipment and implement new phasing and timing (including a split phase for Hartwell Avenue and the jughandle).

Bedford Street at Eldred Street

- Install traffic signal and coordinate with signal at Hartwell Avenue.[3]
- Widen Bedford Street northbound approach to three lanes.
- Install detectors to monitor queues from the southbound I-95/Route 128 exit ramp.

Marrett Road at Waltham Street

- Re-stripe the Waltham Street northbound and southbound approaches to provide an exclusive left-turn lane and shared through/right-turn lane.
- Provide two approach lanes on eastbound Marrett Road (an exclusive left-turn lane and a shared through/right-turn lane).
- Upgrade the signal equipment, including installation of pedestrian signal heads, and adjust signal timing and phasing.

Maple Street at Massachusetts Avenue

- Install traffic signal.
- Consider signalizing Marrett Street at Massachusetts Ave and coordinating the two systems.

Maple Street at Lowell Street

- Investigate limited widening of Lowell Street approaches to provide an exclusive left-turn lane in each direction and determine if widening can be accomplished with little or no impact to adjacent properties.
- Investigate limited widening of Winchester Street approach to provide an additional lane and determine if widening can be accomplished with little or no impact to adjacent properties.
- Reconfigure channelized right-turn lanes to slow traffic and provide easier pedestrian crossings.

Concord Avenue at Waltham Street

- Widen westbound Concord Avenue to provide two lanes. Additional traffic analysis will be necessary to determine the appropriate lane utilization for the widened approach.

Massachusetts Avenue at Woburn Street/Winthrop Street

- Install traffic signal or modern roundabout.

Pleasant Street at Massachusetts Avenue

- Install traffic signal or modern roundabout.

Pleasant Street at Watertown Street

- Install traffic signal or modern roundabout.

Spring Street at Marrett Road

- Install modern roundabout

[3] There is concern that this will attract cut-through traffic to Eldred St, which could impact its status as a proposed bicycle route. Any signalization project should study this possible and its impacts.



Project History and Context

Streets should not be efficient traffic sewers. They are places for human encounter
Robert Campbell, Boston Globe

If freeways solved transportation problems, Los Angeles would be heaven"
Paul Basha, Scottsdale's Traffic Engineer, in The Arizona Republic,

…she comes pulling out in a Blazer. I start pedaling and she comes up and she whacks me and she's goes 'Ohh!' She got all like scared and everything, and then tells me that I should watch where I'm going! It's a tough town if you don't got a car. Can't get around.
Ed Martinez, a bicycler, from the film
Making Sense Of Place, Lincoln Institute of Land Policy

With such thoughts in mind, but tempered by a pragmatic viewpoint of what is attainable, the Lexington Transportation Element held its kickoff meeting on September 9, 2002. An intensive program of public participation occurred over the next several months, fueled by the extensive research that staff and consultant were assembling in support of this process. Education and research efforts funneled into discussions about alternative transportation policies and mitigation measures.

It is important to understand that the Transportation Element is a part of a larger comprehensive planning effort that was begun by the Planning Board, at the behest of Town Meeting, at the end of the year 2000. These efforts have continued to date. *With the adoption of the first part of the Comprehensive Plan by the Planning Board on January 30, 2002—consisting of four elements (Land Use, Natural And Cultural Resources, Housing and Economic Development, plus part of the Implementation Element that integrates in detail all of these topical sections)— this transportation piece, with its related implementation measures, completes the Comprehensive Plan for Lexington.* These six elements are required in the state planning statute, Chapter 41, Section 81D. On August 22, 2002, the adopted elements received official certification by the Commonwealth as an acceptable community development plan, under the Executive Order 418 planning and housing initiative originally signed by Governor Cellucci in January, 2000.

It is equally important to discuss the Board of Selectmen's Vision 2020 process, an intensive, citizen-driven visioning project that involved scores of residents and which took place over a period of approximately 18 months throughout 1999 and into 2000. Vision 2020 pursued a slate

of community goals and objectives in five topical areas, one of which was transportation. The conceptual framework and consensus that emanated from Vision 2020 has been drawn upon directly and extensively throughout the Planning Board's comprehensive planning work, both in the multiple elements adopted in 2002, and in the present transportation element. The Board's Comprehensive Plan became the ideal, more detailed follow-up to the more conceptual Vision 2020, with each complementing the other in a well timed segue.

In summer, 2002, the engineering firm Vanasse Hangen Brustlin (VHB), of Watertown, MA, was hired to assist the Board and staff with this complex and technical transportation project. After a contractual scope of services was established, a broad-based advisory committee was set up to drive the process. This group, referred to as the Transportation Element Advisory Committee (TEAC) included representatives of business, key departments of town government, pertinent committees, particularly the Transportation Advisory committee, and the full Planning Board. The TEAC participated in five themed, structured workshops organized around the different transportation modes; these workshops were: 1) Overview and Analysis of the Existing Transportation System, all modes; 2) Transportation Demand Management and the Land Use Connection; 4) Traffic Analysis/Infrastructure Improvements; 5) Bicycle/Pedestrian Modes. Following this phase, the TEAC worked interactively with staff on the drafting of each part of the document, offering detailed comments throughout the drafting process. All such comments were incorporated or otherwise addressed in the multiple revisions of the chapter drafts by staff and consultant.

The Transportation Element is organized as follows:

CHAPTER I: PROJECT HISTORY AND CONTEXT

Important background information on where the Transportation Element fits into the larger long-range planning activities of the Town of Lexington. Includes a brief summary of process, participants and the workshops and meetings that drove the effort.

CHAPTER II: EXISTING CONDITIONS

A detailed description and critical analysis of the local and regional transportation system in all travel modes—automobile and roadway network; transit and paratransit; transportation demand management; bicycle and walking.

CHAPTER III: CONSIDERATION OF TRANSPORTATION STRATEGIES

The key planning phase connecting the analysis of existing conditions with the detailed future implementation plan. It is driven by the goals and objectives of the public participation process and structured around debate over alternative transportation improvement and mitigation measures in all modes, as well as land use policies.

CHAPTER IV: IMPLEMENTING ACTIONS

The final slate of recommended implementation measures offered by the TEAC and Planning Board, organized strategically around goals and objectives, prioritized in terms of ease of implementation (and secondarily by time duration), and identifying likely primary and secondary players who might logically lead the effort around each proposed transportation measure.

APPENDICES

Various helpful information too detailed, lengthy or peripheral to the process to warrant inclusion in the main body of the document, but still necessary to provide to afford greater depth to the Plan.

Composite Goals and Objectives from Vision 2020 and Comprehensive Plan (original, pre-process version)

The following composite goals and objectives are included for background reference, to make clearer the conceptual wellsprings of this Element. They are provided in their original, unedited form, as they appeared at the beginning of this transportation planning process. To see how they were incorporated, modified or expanded in this document, see the chapters further on entitled: Consideration of Transportation Strategies, and Implementing Actions, chapters three and four, respectively.

COMPOSITE GOALS & OBJECTIVES FROM VISION 20/20 & COMPREHENSIVE PLAN

1. Preserve the quality of life in Lexington through improved traffic management.

- Reduce peak hour commuter traffic and tie-ups
  - Improve transit services
  - Promote public transportation
  - Pursue TDM/trip reduction techniques

- Monitor and attempt to mitigate impacts from all proposed development and air travel expansion at the Hanscom civil airport
  - Ensure that Lexington will stay in the information loop on all Hanscom matters.
  - Require tie-in of expansion with road improvements and environmental coordination.
- Improve traffic safety in high-accident locations

2. Increase transportation alternatives available to single occupancy vehicles

- Increase availability of public transportation (local, regional and intercity).
  - Increase number of routes to major work sites and circumferential highways.
  - Better coordination of routes (with neighboring towns, "T", commuter rail).
  - Work to establish more employer-based transit links & shared transit links.
- Increase use of bicycles.
  - Educate public.
  - Encourage students to bicycle to school through incentive programs and secure bike parking.
  - Designate a bicycle route system and implement it.

- Increase employer based transportation demand management programs and employee incentives to use them.
- Increase pedestrian activity.
  - Improve infrastructure.
- Increase school bus usage and reduce traffic at schools. Discourage driving to school by providing incentives to use other modes.

3. Use parking strategies to help achieve transportation goals at certain locations

- Amend parking requirements so as to avoid excessive parking requirements for commercial and industrial uses.
- Reduce vehicular trips from High School.
  - Increase parking fees (yearly fees, add parking meters).
  - Encourage use of buses and alternative modes; provide early education in the use of Lexpress.

4. Improve and better maintain the infrastructure

- Institute a capital improvements plan for traffic calming at strategic locations.
- Improve road conditions.
  - Adhere to town study for 5-year repair and reconstruction plan.
  - Repair in a timely fashion.
- Improve and expand sidewalk network.
  - Survey conditions and prioritize repairs.
  - Repair in a timely fashion.
  - Survey existing network and develop plan for expanding network.
- Improve bicycle path conditions.
  - Survey bicycle path conditions and prioritize repairs.

5. Involve Lexington in local and regional transportation planning

- Adhere to the process to evaluate Lexington's transportation infrastructure.
  - Use the existing infrastructure survey process consistently.
- Increase Lexington's involvement in regional planning.
  - Participate in regional planning organizations (HATS, MAPC/MAGIC, MAPC, Minuteman Group or other inter-local coordination).
  - Establish intermodal transportation routes connecting Lexington with transportation centers.
- Improve access and coordination with regional transportation centers and airports (i.e. Woburn, Alewife, Route 128)

6. Investigate Land Use Policies that can assist with Transportation Goals

  - Identify nodes and areas served by public transportation that might be logical for prudent planned development designations and greater mix of uses.
  - Update home occupation provisions in zoning, to reflect changing economic activity and eliminate commuters (but with protective controls).
  - Consider feasibility of adding limited housing uses at certain non-residential locations.

PARTICIPATION PROCESS

Initial Planning Board Meetings on Comprehensive Plan
May 6, 8 and 15; June 15 and 19; August 7 and 21, 2002

Planning Board and Transportation Element Advisory Committee Thematic Workshops

September 9, 2002	Kickoff Meeting, Discover Perspectives, Look for Common Themes
October 15, 2002	Transportation Demand Management/Land Use-Transportation Connections
November 14, 2002	Transportation Demand Management/Transit
December 18, 2002	Traffic/Infrastructural Improvement Program/Policy Development
January 22, 2003	Bicycle-Pedestrian Improvement Program/Final Land Use/Transportation Policies

External Groups

November 20, 2002	Presentation to the Annual Meeting of the South Lexington Transportation Task Force
February 4, 2003	Presentation to the Lexington Business Partnership

Active Participants

Planning Board and Staff
Sara Chase, John Davies, Anthony Galaitsis, Thomas Harden and Karl Kastorf, Planning Board; Glenn Garber; Elizabeth Machek, Maryann McCall-Taylor; Elissa Tap, Planning Staff; Mary Jo Bohart, Economic Development Officer; David Carbonneau, Assistant Town Engineer; Gail Wagner, Transportation Coordinator; Michael Young, Management Intern

Consultants
Vanasse Hangen Brustlin, Inc. Watertown, MA: Howard Muise, Project Manager; Heidi Richards; Susan Sloane-Rossiter; Steve McNeill; William Cranshaw; Ken Schwartz and Galeeb Kachra

Transportation Element Advisory Committee (TEAC)
Residents: Lawrence Belvin, Robert Burbidge, Julian Bussgang, Richard Canale, Jacquelyn Davison, Thomas DeNoto, Elaine Dratch, Ed Ganshirt, Donald Graham, Ed Grant, Marita Hartshorn, Stewart Kennedy, Jeanne Krieger, William Levison, Wendy Manz, Michael Schroeder and Jerry Van Hook

Business: Charles Kalauskas, BSC Group; Alison McLaughlin, F. W. Dodge; Peter Nichols, The Beal Companies; Melissa Riccio, Ipswitch, Inc.; James Rosenfeld, Boston Properties; Roger Sudbury, MIT Lincoln Labs



Existing Transportation Conditions

INTRODUCTION

Overview

This chapter describes the existing transportation system in all modes—automotive travel and the street and highway network supporting it; the available transit and related services; transportation demand management (TDM) programs to reduce vehicular trips among employees in town; and non-vehicular modes—walking and bicycling. In explaining this network and all of its component parts, deficiencies as well as positive opportunities in the system will become apparent.

While some of the movement associated with the different travel modes is internal to Lexington (beginning and ending within town borders), it is also important to note that the transportation system is integrated into a vast regional system in Greater Boston, whereby the origin or destination of automotive, transit, TDM and even pedestrian trips involves a geographic area that is metropolitan in scope. Ultimately, however, from the viewpoint of residents and workers in Lexington, the issue is one of quality of life, largely as it is negatively impacted by traffic congestion. The utter dominance of the automobile as a single occupancy vehicle in the existing transportation system presents a great challenge to the community.

Lexington residents have the option to travel by walking, biking, local or regional bus, paratransit, or taxi. The predominant means of transportation in Lexington, however, is the private automobile. This is increasingly the case throughout the country; the number of vehicles miles traveled by passenger car in the United States rose 12% during the 1990s.[1] Automobile ownership has increased as well: 24% of households now have more vehicles than licensed drivers.[2]

While the automobile offers flexibility and convenience for individual users, it has negative personal and environmental impacts when used en masse. Exhaust gases, time spent in traffic congestion, noise pollution, and fossil fuel consumption are just a few of these. Recently, the Center for Disease Control, along with other public health organizations, has begun to study the role of the private automobile in the rise of obesity in the United States.

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[1] Bureau of Transportation Statistics: "National Transportation Statistics 2002"
[2] 2001 National Household Transportation Survey

In Lexington, the repercussions of automobile dependency are being felt by residents stuck in traffic, neighborhoods experiencing high traffic volumes on local streets, and by schoolchildren whose parents feel it is too dangerous to allow them to walk to school. Existing road networks are nearing capacity, many intersections fail in level of service for hours each day, and there is no community support for the construction of major new roads. Even if there were, there is relatively little land available in this mature suburb.

To better understand the nature of the problem, we began with a survey of existing conditions in Lexington. This data forms the basis of the strategies and actions proposed in following chapters.

Travel Patterns

Lexington is predominantly a residential community with pockets of retail, office, and light industrial development. The major residential type is multistory single-family homes. There is a growing number of condominium developments, and a stable number of multifamily homes, and apartments as well. There is some small-scale retail in the Town Center, as well along Massachusetts Avenue toward Arlington and at scattered sites throughout the town, including the intersections of Bedford Street and Worthen Road and Lowell Street and Worthen Road. The major centers of employment are the Hayden Avenue /Spring Street area and the Hartwell Avenue / Hanscom area. Both have easy access to major highways. The latter is home to the Hanscom Air Force Base and the Massport-run Hanscom Field Civil Airport, which together generate more than 13,000 vehicle trips each day. The Town Center also contains a significant number of employers, although on a smaller scale. The Town Center is also home to the Battle Green and several buildings of historical interest. Along with the Minuteman National Historical Park and the National Heritage Museum, Lexington Center is a major tourist destination. The major attractions, which include schools and recreation areas, tend naturally to generate the most traffic.

People make many different kinds of trips during the course of a day. These include commuting, shopping, attending events and functions, socializing, running errands and many others. While commuting accounted for only 14.8% of all travel in 2001,[3] an analysis of commuting patterns is still a useful way to understand the dimensions of the problem in a given area. Since the home-work trip typically occurs on a regular schedule, it is also the easiest kind of trip to address through transit or transportation demand management. The decennial Census includes questions about commuting under the heading 'journey-to-work'. The following paragraphs summarize Census 2000 journey-to-work data for Lexington and compare it with 1990 data.

From 1990 to 2000, the total number of workers living in Lexington decreased from 15,082 to 14,482, yet the average length of the commute trip increased from 24.87 to 28.75 minutes. This could be due to increased traffic volumes, further separation of the home and workplace, or both.

The mode of transportation data from 1990 to 2000 was relatively unchanged. Approximately 80% of Lexingtonians commute to work by driving alone. The biggest change percentage change

[3] National Household Travel Survey, 2001; both shopping and family/personal trips were more frequent

over the period was in the number of people working at home (and thus not commuting), an increase of 2.3%.

Of the 14,482 workers living in Lexington in the year 2000, 23.91% worked in Lexington; 76.09% outside of Lexington. 27.1% of workers living in Lexington worked outside of Middlesex County.[4] These numbers are fairly similar to those recorded in the 1990 Census. The total number of people who both live and work in Lexington has declined slightly, from 3,700 to 3,463. The total number of those living in Lexington but working outside of Middlesex County increased slightly, from 3,412 to 3,638.

As of this writing (April 2003), detailed (place-to-place) commuting data from the Census 2000 had not yet been released.[5] Data from the 1990 Census has been examined to give some indication of commuting patterns to and from Lexington. The general similarities noted above give some hope that these patterns are indicative of current conditions. Knowing where people who work in Lexington live, and where people who live in Lexington work, can be helpful in deciding what measures might be effective in addressing peak hour travel demands.

In 1990, 24,042 people worked in Lexington and 15,082 workers lived in Lexington. The largest employment destination of people living in Lexington was Lexington (24.9%), followed by Boston (13.6%), Cambridge (11.5%), Waltham (7.3%), and Burlington (6.1%). The largest group of people working in Lexington also lived in Lexington (16.4%), followed by those living in Arlington (4.9%), Waltham (4.2%), Bedford (3.9%), and Boston (3.8%). While the majority of workers living in Lexington worked in the state, their workplaces were scattered among some 100 different Massachusetts cities and towns. People working in Lexington lived in 171 Massachusetts cities and towns, and 88 out-of-state locations.

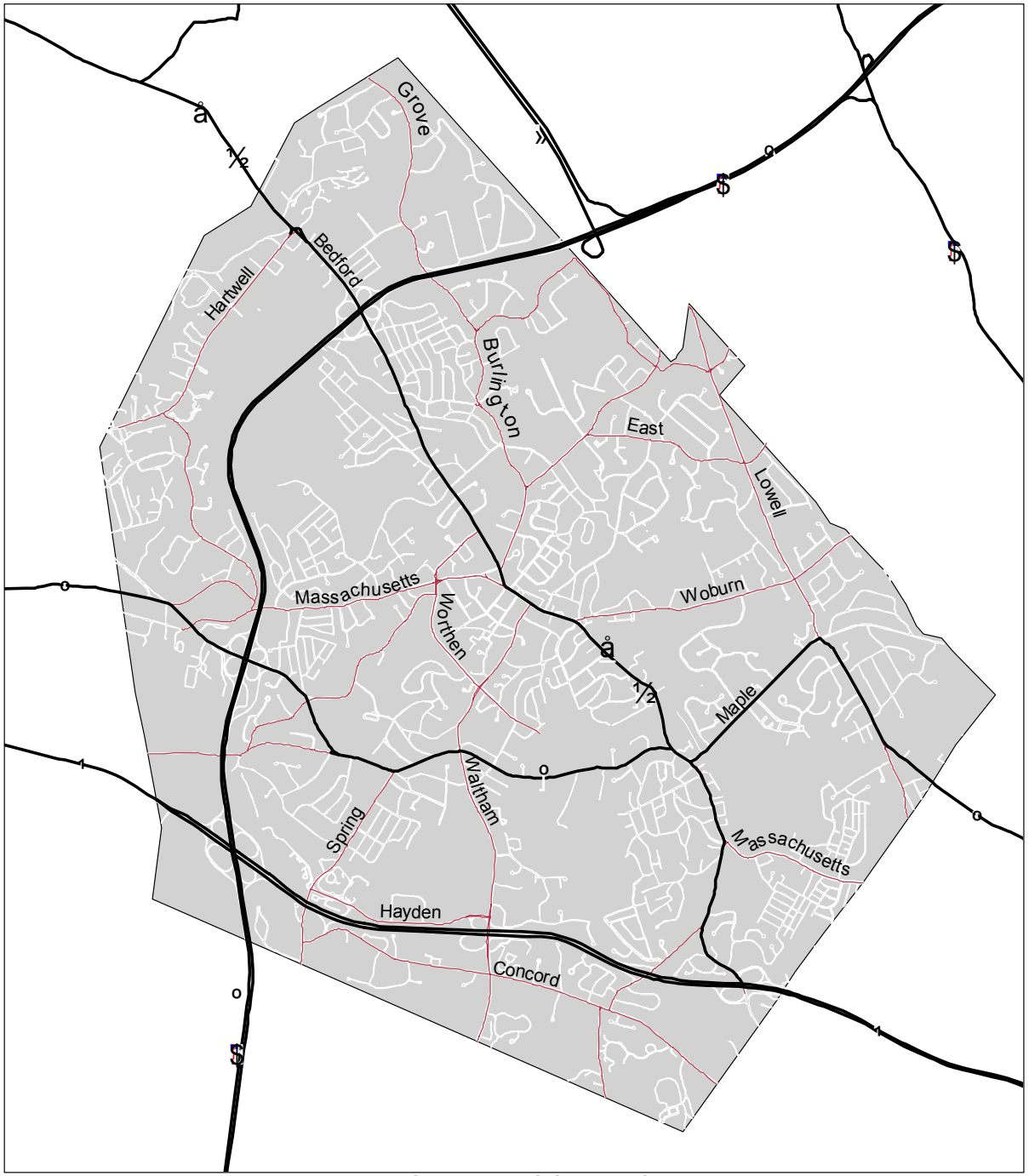
These numbers indicate there is no very large concentration of employees coming from one particular community. Further analysis of the data indicates that workers commuting to Lexington from any one particular community work in a variety of places throughout the town. A focus on programs for residents of Lexington is likely to make more of an impact than a focus on programs for workers commuting to Lexington from other communities. Not only are there larger numbers of people going to the same area, but Boston and Cambridge, the second and third most common destinations, have strong public transportation systems.

ROADWAYS

Roadway Network

The Town of Lexington is located about 11 miles northwest of Boston at the intersection of two major limited access regional highways: the I-95/Route 128 circumferential highway and Route 2, a major radial highway emanating from Boston (see Map 1). The Town's location allows for

[4] The Census data that has been released to date is restricted to place, MSA, county, and state level data.
[5] If the Census Transportation Planning Package is released in time, detailed data from the Census 2000 will be included in this Element.



Map 1. Roadway Network: Lexington, Massachusetts

Legend

- Interstates and Numbered Routes
- Major Roads
- Local Streets

3000 0 3000 6000 Feet

Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington

easy highway access. I-95/Route 128 provides access to all major radial highways from greater Boston, including Route 3 to Cape Cod, I-95 to Rhode Island and points south, Route 24 to New Bedford/Fall River, the Massachusetts Turnpike (I-90) to the west, and I-93 and I-95 to New Hampshire and points north. Route 2 provides access to Boston and points west of Lexington.

Other state-numbered roadways through town include Route 2A and Routes 4/225. Route 2A is a generally east-west route connecting Arlington to Lincoln. It follows Summer Street, Lowell Street, Maple Street, Marrett Road, and Massachusetts Avenue. Route 4/225 runs between Route 2 near the Arlington town line and I-95/Route 128 and the Town of Bedford. It follows Watertown Street, Pleasant Street, Massachusetts Avenue, and Bedford Street.

There are several other significant roadways through and within the town. Massachusetts Avenue, which begins in Boston and continues out towards Central Massachusetts, functions in Lexington as the town's main street. It is the main roadway through the Town Center and is the location of the Town's major retail area and Town government offices. It is generally a two-lane roadway but widens to four lanes through the Town Center.

Waltham Street, Bedford Street, and Woburn Street are all two-lane roadways that connect Lexington Town Center with the centers of Waltham, Bedford and Woburn, respectively. Important roadways providing access to major employment centers include Hartwell Avenue/Maguire Road, which borders Hanscom Field, and Hayden Avenue, which parallels Route 2.

Intersections

The focus of roadway improvements in the Lexington Transportation Element is to provide for more efficient utilization of the existing roadway infrastructure. The first step in developing a roadway improvement action plan was to identify a list of intersections to be considered for improvements. This list was developed through discussions with the Town's Planning and Engineering Departments and an assessment of the safety characteristics of the intersections within the Town. To better understand the magnitude of the traffic issues at the study intersections, the following traffic data were collected and reviewed:

- Accident data for the most recent three-year period
- Physical characteristics
- Geometric conditions
- Adjacent land uses
- Current operating conditions
- Traffic volumes (where available)

In order to identify accident trends, safety concerns, and/or roadway deficiencies, accident data were obtained for the three and a half-year period from January 1999 to mid-2002, the most recent data available. The Planning Department and VHB collected this information from the Police Department records. A summary of the accident data is presented in Table 1. Typically an accident (crash) rate is also calculated for each intersection. The rate represents the ratio of the

number of accidents to the total volume of traffic traveling through the intersection. This is usually an effective tool to measure safety hazards. As part of this study, however, traffic counts were not conducted at the study intersections and therefore a crash rate cannot be calculated. There is, however, a rule of thumb that 5 or more accidents per year establish that an intersection should be reviewed for safety issues. The traffic thresholds for the possible installation of a traffic signal or four-way STOP control use the 5 accidents per year as a factor in determining if installation is warranted.[6]

Other data sources were recent traffic studies for individual development projects and conversations with the Department of Public Works regarding operating conditions, including congestion, delay, queuing and levels of service.

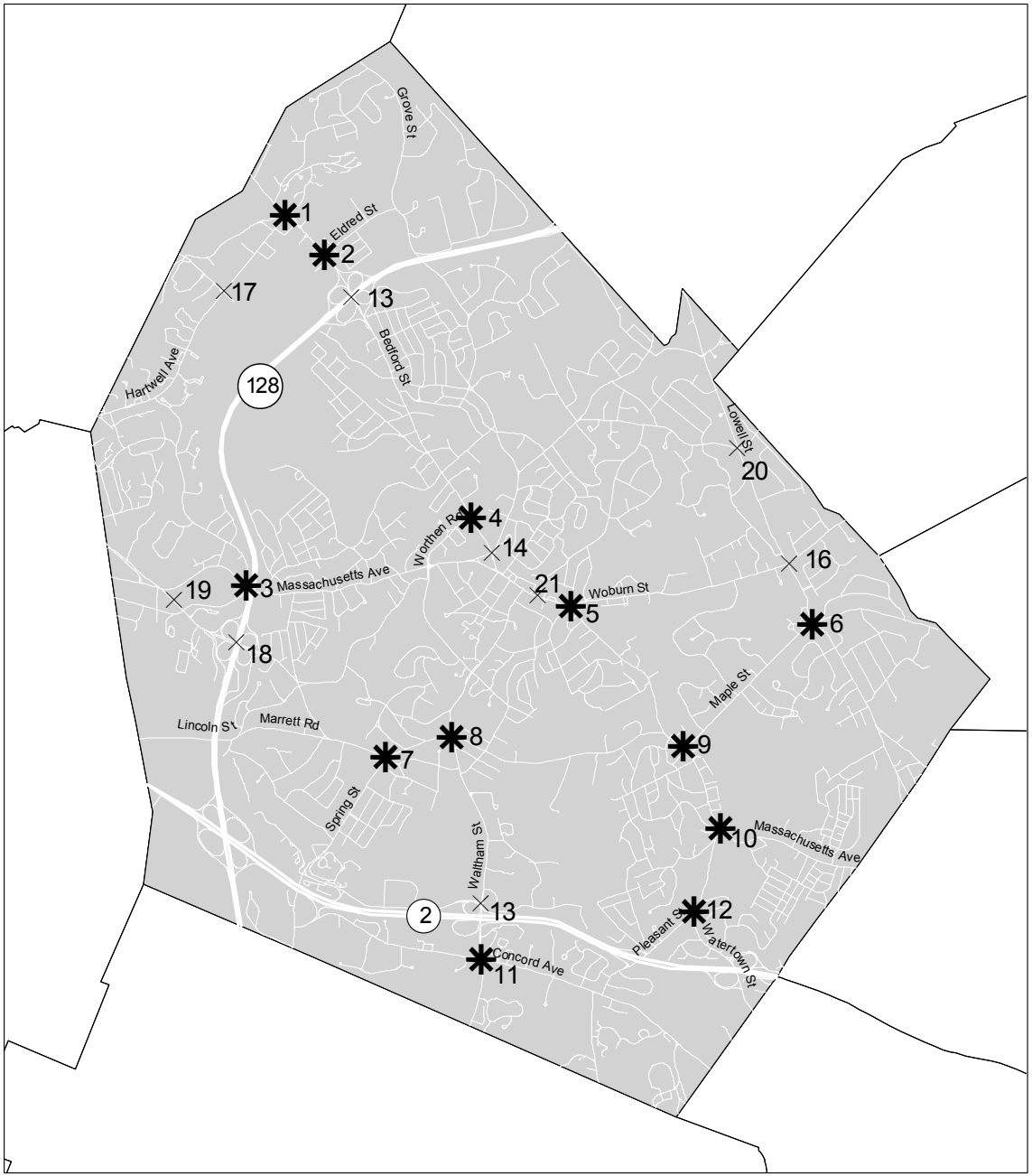
This list identifies those intersections that were evaluated and indicates whether or not they were considered for capital improvements. Specifics of proposed improvements appear in Chapters III and IV.

1. Bedford Street (Route 4/225) at Hartwell Avenue is a signalized "T" intersection with a jug-handle provided along Bedford Street northbound for U-turns and left turns onto Hartwell Avenue. There is extensive queuing on Bedford Street during the peak hours, particularly on the southbound approach. Next to the Bedford Street interchange with I-95/Route 128, this intersection is the highest accident intersection. There were 83 accidents recorded in a three and one-half year period and many of the accidents are likely due to the limited sight distance on the Hartwell Avenue approach. Vehicles approaching the intersection from Hartwell Avenue, which has a green signal indication at the same time as the jug handle approach, have difficulty seeing the approaching traffic from the jug handle. Field observations revealed many near collisions of vehicles making a left turn from Hartwell Avenue with vehicles going straight from the jug handle. Bedford Street is a state numbered route but is under Town jurisdiction.

2. Eldred Street at Bedford Street (Route 4/225) is a "T" intersection with Bedford Street as the major roadway. As at the previous intersection, Bedford Street at this location is a state numbered route but is under Town jurisdiction. Eldred Street connects to the residential area east of Bedford Street and north of Route 128. The Eldred Street approach, which is under STOP sign control, consists of one shared left-turn/right-turn lane. Left turns from Eldred Street onto Bedford Street are currently prohibited during peak hours. Bedford Street provides two lanes in each direction. The intersection is also one of the highest accident intersections. Because of heavy volumes and relatively high speeds along Bedford Street it is difficult for traffic to exit Eldred Street. Southbound Bedford Street traffic turning left into Eldred Street must use the left-through lane, another potential cause of accidents.

3. Massachusetts Avenue at Wood Street is a three-legged intersection with Wood Street under STOP Sign control. The intersection falls within the Minuteman National Historic Park. I-95/Route 128 is approximately 150 feet to the east of the intersection with Massachusetts

[6] Manual on Uniform Traffic Control Device; Millennium Edition; Federal Highway Administration; Washington DC; 2001.



Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington

Map 2. Problem Intersections Analyzed

1. Bedford St and Hartwell Ave
2. Bedford St and Eldred St
3. Mass Ave/Old Mass Ave/Wood St
4. Bedford St and Worthen Rd
5. Mass Ave and Woburn Rd
6. Maple St and Lowell St
7. Spring St and Marrett Rd
8. Waltham St and Marrett Rd
9. Maple St and Mass Ave
10. Mass Ave and Pleasant St
11. Waltham St and Concord Ave
12. Pleasant St and Watertown St
13. Bedford St at Rte 128
14. Bedford St at Harrington Rd and Hancock St
15. Waltham St and Hayden Ave
16. Lowell St and Woburn St
17. Hartwell Ave and Maguire Rd
18. Marrett Rd at Rte 128
19. Mass Ave/Old Mass Ave/Marrett Rd
20. Lowell St and East St
21. Mass Ave and Grant St

Legend

Study Intersections

- proposed improvements
- analyzed, no improvements proposed

2000 0 2000 4000 Feet

Avenue spanning the interstate highway. The intersection of Old Mass Avenue and Wood Street is approximately 300 feet north of the intersection. Old Mass Avenue is used as a cut-through from Hanscom Airfield. Vehicles travel at fairly high speeds along Massachusetts Avenue making it difficult to exit Wood Street onto Massachusetts Avenue. The Wood Street approach provides one lane and is fairly narrow, making it difficult for right turning vehicles to squeeze by left-turning vehicles.

4. Bedford Street at Worthen Road and Camellia Place is a four-legged signalized intersection. The traffic signal operates with the Bedford Street approaches moving together and Worthen Road and Camellia Place moving at the same time. Bedford Street southbound approach provides an exclusive right turn lane and a through-left lane. The northbound Bedford Street approach and Camellia Place each have only one general lane. Camellia Place is a low volume road that operates more as a driveway. The Worthen Road approach provides two approach lanes (neither of them striped). The traffic signal is equipped with an Opticom emergency preemption system for the fire station located approximately 100-150 feet south of the intersection. There are several retail establishments on the corners of the intersection. There are crosswalks provided on the Bedford Street and Worthen Road approaches and the traffic signal has an exclusive pedestrian phase available with push-button control.

5. The intersection of Massachusetts Avenue at Woburn Street, Winthrop Street and Fletcher Avenue has STOP sign control on Winthrop Street, Fletcher Street and Woburn Street. Massachusetts Avenue is uncontrolled. There is a large triangular traffic island with two-way traffic permitted on all sides. All approaches have a single general lane and there is parking permitted along both sides of Massachusetts Avenue to the west of the intersection. Winthrop Street enters Massachusetts Avenue from the south and provides a cut-through for traffic coming from Waltham Street headed north or east, avoiding the intersection of Massachusetts Avenue at Waltham Street. The movements from Winthrop Street, across Massachusetts Avenue, to Woburn Street are dangerous, with difficult sight distance out of Winthrop Street and higher speed traffic on Massachusetts Avenue. There is an expanse of pavement where Massachusetts Avenue and Woburn Street connect. Two-way operations on all sides of the island create several locations where there are conflicting and potentially confusing traffic movements.

6. Maple Street at Lowell Street is a signalized four-legged intersection with very large channelized right turn lanes on the Maple Street eastbound approach and the Lowell Street southbound approach. These channelized right-turn lanes allow drivers to make turns at relatively high speed, posing a hazard to pedestrians trying to cross the Maple Street eastbound approach.

7. The Spring Street at Marrett Road intersection is an unsignalized intersection. Marrett Road extends east-west with Bridge Street and Spring Street intersecting it adjacent to each other along the south side. Both of the side streets are controlled by STOP signs. Bridge Street operates one-way northbound into Marrett Road. Marrett Road is designated as State Route 2A and is under state jurisdiction. There are generally residential properties along Bridge Street and east of the intersection along Marrett Road, while there are commercial developments west of the intersection. This intersection is open, with a large expanse of

pavement. According to a traffic analysis conducted in 1997, this intersection operates at Level Of Service (LOS) F during both the morning and evening peak hours.[7] This condition applies to northbound Spring Street traffic, which has difficulty exiting onto Marrett Road.

8. Marrett Road (Route 2A) at Waltham Street is a four-legged signalized intersection. Marrett Road is state numbered Route 2A and is under state jurisdiction. Marrett Square, a small retail center, is located on the northwest corner of the intersection, a Dunkin Donuts is on the northeast corner, a Gulf gas station and Mobil gas station are on the southwest and southeast corners, respectively. Each of the approaches to the intersection is striped as one lane with the exception of Waltham Street southbound, which has a through/left-turn lane and a small channelized right-turn lane. Because of the roadway width, vehicles are able to operate in two lanes (a left-turn lane and a through/right-turn lane) on both Waltham Street approaches. The curb cuts along the Gulf gas station property are wide open with confusing right-of-way/direction of vehicular travel. The pedestrian crossing signal equipment is outdated and consists of pedestrian buttons that trigger the traffic signal to turn yellow and red simultaneously. There are no pedestrian signal heads. There are fairly long queues on Waltham Street and Marrett Road eastbound during peak hours.

9. Maple Street at Massachusetts Avenue is a "T" intersection with the Maple Street approach under STOP sign control. Maple Street is designated as State Route 2A and is under state jurisdiction. Massachusetts Avenue is designated as State Route 4/225 and is under local jurisdiction. There is a large circular island in the center of the Maple Street approach. All vehicles approaching Massachusetts Avenue from Maple Street travel on the west side of the island while all vehicles turning from Massachusetts Avenue to Maple Street travel on the east side of the island. The correct direction of travel at this intersection is unclear and the high accident rate may reflect driver confusion. There is peak hour queuing on the Maple Street approach because of the high volume of traffic on Massachusetts Avenue and the high number of vehicles turning left from Massachusetts Avenue eastbound onto Maple Street. Vehicles slowing to make this move block vehicles trying to exit Maple Street.

10. Pleasant Street at Massachusetts Avenue and Follen Road essentially operates as a rotary with STOP sign control on the Pleasant Street and Follen Road approaches. Each of the approaches provides one general purpose lane with the exception of Massachusetts Avenue westbound which provides as an exclusive left turn lane and a through lane. During the peak hours, it is difficult for vehicles to exit Pleasant Street and Follen Road onto Massachusetts Avenue. Pleasant Street generates long queues during the peak hours. Pedestrian crossings within the vicinity of this intersection are difficult. There is a large expanse of pavement within the limits of this intersection adding to driver confusion and the difficult pedestrian crossings.

11. Concord Avenue at Waltham Street is a four-legged signalized intersection located approximately 1,000 feet south of the Route 2 Waltham Street ramps. Each approach to the intersection provides a single general through lane although both Waltham Street approaches, which are approximately 43 feet wide, are used as two lanes. The southbound approach is used as a left-turn lane and a shared through/right-turn lane. The northbound approach is

[7] Office Expansion, 55 Hayden Avenue Lexington, Massachusetts, Abend Associates, January 10, 1997.

used as a shared through/left-turn lane and a shared through/right-turn lane. The traffic signal operates as a semi-actuated, two-phase operation. Land uses that abut the intersection include a day care center, a gas station, medical offices and residential. Crosswalks are provided on all approaches.

12. Pleasant Street at Watertown Street is a "Y" intersection with the Pleasant Street southbound approach forming the base of the Y. The northbound Pleasant Street approach is STOP sign controlled at a traffic island. The island essentially directs traffic to and from the southern Pleasant Street leg to and from Watertown Street and creates driver confusion for vehicles traveling through the intersection. The southern Pleasant Street leg enters Watertown Street/Pleasant Street at a sharp angle that creates sight distance issues for vehicles exiting Pleasant Street northbound. Field observations revealed that vehicles queue up along Pleasant Street northbound and can block vehicles attempting to enter Pleasant Street southbound from Watertown Street.

13. Bedford Street at Route 128: Bedford Street at Route 128 was rated as the highest accident location in Lexington with 134 accidents over the three and one-half year period analyzed (see below). This location is a full cloverleaf interchange providing only right turns onto and off of the Route 128 ramps to and from Bedford Street. There are no traffic signals at any of the ramp junctions. Because the interchange is under MassHighway jurisdiction, it was not reviewed for improvements as part of the Town's Transportation Element. The intersection of Bedford Street at Hartwell Avenue was reviewed for possible improvements that could also have positive impacts on the128 interchange.

14. Bedford Street at Harrington Road/Hancock Street: This is a four-way intersection adjacent to the Battle Green. Bedford Street is the main street with Harrington Road and Hancock Street controlled by STOP signs. Exiting the side streets can be difficult during periods of heavy traffic flow on Bedford Street. Because the intersection is on the National Register of Historic Places and is within the Historic District, it was not deemed a desirable location to make improvements.

15. Waltham Street at Hayden Avenue: This intersection is a T-type intersection adjacent to the Route 2 interchange with Waltham Street. Hayden Avenue provides access to and through a major business area along Route 2 between Waltham Street and Spring Street. Hayden Avenue is STOP-controlled at Waltham Street. Because the intersection is very close to the Route 2 westbound off-ramp to Waltham Street northbound, it creates a difficult maneuver for traffic exiting Route 2 and turning left onto Hayden Avenue. Channelization improvements were implemented in 1999-2000 and the intersection was not reanalyzed as part of this study.

16. Lowell Street at Woburn Street: This is a four-way intersection with commercial land uses on each corner. It is signal controlled and was recently reconstructed. As a result it was not analyzed for improvements as part of the Transportation Element.

17. Hartwell Avenue at Maguire Road: This is a T-type intersection in the middle of the Hartwell Avenue/Maguire Road business area. Maguire Road is STOP-controlled at Hartwell

Avenue and exiting Maguire Road can be difficult during busy times. The intersection is a short distance from the Minuteman Bikeway crossing of Hartwell Avenue. Design and permitting for intersection improvements were complete prior to this study; however, no funding is currently available for construction.

18. Marrett Road (Route 2A) at Route 128: This location is a full cloverleaf interchange providing only right turns onto and off of the Route 128 ramps to and from Marrett Road. There are no traffic signals at any of the ramp junctions. Because the interchange is under MassHighway jurisdiction, it was not reviewed for improvements as part of the Town's Transportation Element.

19. Massachusetts Avenue at Marrett Road: This is a four-way intersection with the fourth leg providing access to the Minuteman Vocational Technical School. It is a signalized intersection operating at generally good levels of service. The intersection had a lower number of accidents. Because of these two factors it was not analyzed for improvements.

20. Lowell Street at East Street: This fully signalized intersection in a single family residential area has pedestrian on-demand crossings, sidewalks with granite curbing on Lowell and one side of East, and a channel island facilitating the right hand turn movement from southeast-running Lowell onto East. Lowell becomes a major commercial arterial, the Middlesex Turnpike, just over the nearby Burlington town line, while East is a significant feeder from central and northwest parts of Lexington to the Turnpike retail and employment areas. Accident data reveals that the intersection functions with a fairly high degree of safety due to the controls.

21. Massachusetts Avenue at Grant Street: This is a T-type of intersection in the Town Center. It is unsignalized, with STOP control on the Grant Street approach. Massachusetts Avenue has four travel lanes in this section. Exiting Grant Street can be difficult during times of heavy traffic flow on Massachusetts Avenue. The traffic signal at Waltham Street and Massachusetts Avenue sometimes provides breaks in traffic flow that can make it easier for vehicles to exit Grant Street. This intersection had a lower number of accidents and was not analyzed for this study.

Table 1 Intersection Accident Summary — 1999-2002

Scenario	Bedford Street at Route 128	Bedford Street at Hartwell Avenue	Bedford Street at Eldred Street	Bedford Street at Harrington Road & Hancock Street	Marrett Road at Waltham Street	Maple Street at Mass Avenue	Lowell Street at Maple Street	Waltham Street at Hayden Avenue	Lowell Street at Woburn Street	Bedford Street at Worthen Road
Rating	1	2	3	4	5	6	7	8	9	10
Year										
1999	49	31	21	3	15	20	17	11	15	8
2000	42	20	16	19	12	12	12	12	9	9
2001	38	28	13	18	18	10	7	5	5	10
2002[1]	5	4	5	11	2	2	4	3	2	3
Total	134	83	55	51	47	44	40	31	31	30
Type										
Motor vehicle in traffic	129	79	53	50	38	42	37	27	28	27
Unknown–Other	5	4	2	1	9	2	3	4	3	3
Severity										
Property Damage Only	86	57	23	38	38	34	26	17	24	26
Personal Injury	48	26	32	13	9	10	14	14	7	4
Fatality	0	0	0	0	0	0	0	0	0	0
Pavement/Weather										
Dry	110	60	45	44	42	42	33	25	23	25
Wet	17	20	10	6	5	2	5	5	6	4
Snow/Ice	2	0	0	0	0	0	0	0	0	0
Other	5	3	0	1	0	0	2	1	2	1
Time of Day										
7:00 to 10:00 AM	39	12	11	15	13	15	11	12	4	5
3:00 to 6:00 PM	33	22	12	16	9	9	13	9	9	8
Other	62	49	32	20	25	20	16	10	18	17

Source: Compiled by The Town of Lexington Planning Department and Vanasse Hangen Brustlin, (VHB) Inc. from Town of Lexington Police Department records

1 Data for 2002 are for the first half of the year.

Table 1 (cont.) Intersection Accident Summary — 1999-2002

Scenario	Concord Avenue at Waltham Street	Hartwell Avenue at Maguire Road	Marrett Road at Route 128	Woburn Street/Mass Avenue at Fletcher Avenue	Mass Avenue at Grant Street	Pleasant Street at Mass Avenue	Mass Avenue/ Old Mass Avenue /Marrett Road	Pleasant Street at Watertown Street	Lowell Street at East Street	Old Mass Avenue/ Mass Avenue/ Wood Street	Marrett Road at Spring Street
Rating	11	12	13	14	15	16	17	18	19	20	21
Year											
1999	11	10	11	6	5	5	5	4	4	4	2
2000	8	9	7	10	4	6	2	4	5	2	3
2001	7	7	6	4	13	5	5	5	2	4	1
2002[1]	2	2	3	6	1	2	5	2	1	1	1
Total	28	28	27	26	23	18	17	13	12	11	7
Type											
Motor vehicle in traffic	27	27	23	22	21	15	15	10	11	7	4
Unknown–Other	1	1	4	4	2	3	2	3	1	4	3
Severity											
Property Damage Only (Over $1,000)	19	12	21	20	19	17	8	12	7	7	4
Personal Injury	9	16	6	6	4	1	9	1	5	4	3
Fatality	0	0	0	0	0	0	0	0	0	0	0
Pavement/Weather											
Dry	20	25	21	21	20	14	14	12	8	8	7
Wet	6	2	5	3	2	3	2	1	2	2	0
Snow/Ice	0	0	0	1	0	0	0	0	0	0	0
Other	2	1	1	1	1	1	1	0	2	1	0
Time of Day											
7:00 to 10:00 AM	8	12	11	7	5	5	4	2	4	3	2
3:00 to 6:00 PM	9	7	6	7	7	5	3	4	2	3	0
Other	11	9	10	12	11	8	10	7	6	5	5

Source: Compiled by The Town of Lexington Planning Department and Vanasse Hangen Brustlin, (VHB) Inc. from Town of Lexington Police Department records

1 Data for 2002 are for the first half of the year.

TRANSIT

Lexington's transit service consists of MBTA intercity bus service, the LEXPRESS in-town bus service, some demand-responsive van services for the elderly and disabled, and a commuter shuttle operated by the 128 Business Council, a transportation management association. Of these, MBTA Route 62/76 carries by far the highest number of passengers.

While Lexington has a number of options for a town of its size and population density, the existing transit network is limited in its usefulness. LEXPRESS ends operations by 7:00 P.M. at the latest on weekdays, which is a handicap in attracting commuters who keep irregular hours. The relative infrequency of transit service during the hours in which it operates further reduces its attractiveness. Another limitation is the lack of Sunday service by any public transportation provider in the area. Most residents cannot depend wholly on existing public transit and maintain their current quality of life. For those who cannot or do not wish to drive, however, the existing public transit system is immensely valuable.

MBTA Transit Service

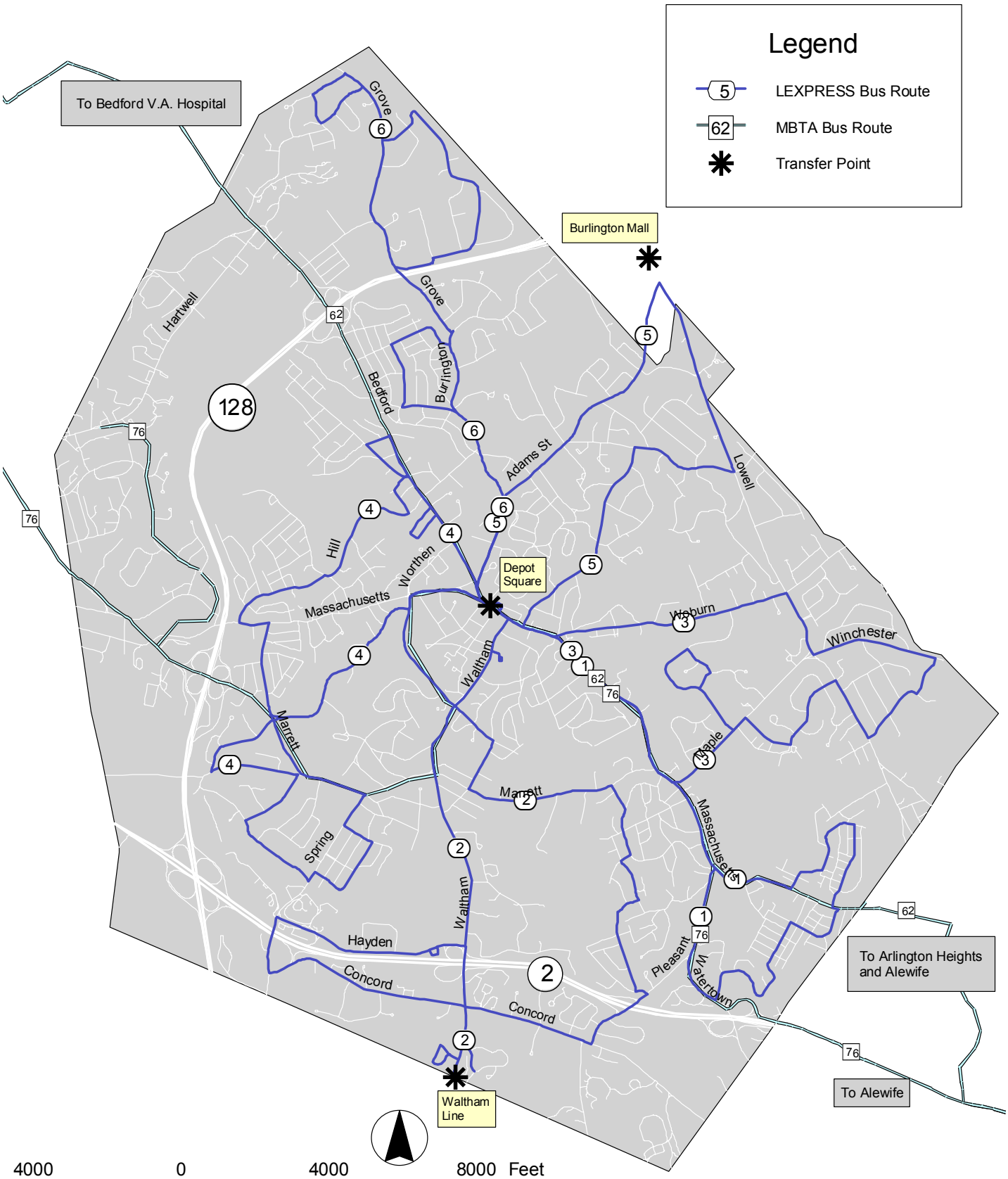
The MBTA operates the Route 62/76 service through Lexington on weekdays and Saturdays. Both routes operate between the Town Center and Alewife Station. Route 62 operates between the Center and the Bedford V.A. Hospital while Route 76 operates between the Center and Hanscom Field and the Air Force Base (AFB).

The routes provide weekday service between the Center and Alewife Station from 6:00 AM to 10:00 PM. Both routes operate on 30-minute headways during peak hours, providing 15 to 20-minute frequency between the Center and Alewife Station. Off-peak service is hourly on each route, with 25 to 35-minute frequency between the Center and Alewife Station. Scheduled travel time between the Center and Alewife Station is typically 22 minutes. Saturday service is provided hourly, from 6:00 AM to 10:00 PM. There is no service on Sundays.

In addition to the connection to the Red Line at Alewife Station, the MBTA bus service provides limited connections to other bus routes. The Route 62 bus travels through Arlington Heights and connects to the terminus of Route 77 and Route 79, which serve the Massachusetts Avenue corridor through Arlington and into Cambridge.

A 1998 ridership survey performed by the MBTA found that out of 2,050 trips/day on the Route 62/76 bus, 1368 had their origin or destination in Lexington. The 76 branch carried somewhat more of these trips–778–than the 62, which carried 590. Inbound and outbound trips were fairly well balanced.

Map 3: Bus Routes



Connections:
Burlington Mall: Burlington B-Line, LRTA, Lexpress, MBTA Rt 350/351
Depot Square: Lexpress, MBTA Rt 62/76
Waltham Line: Lexpress, Waltham Citibus

Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington

LEXPRESS Transit Service

LEXPRESS is a Town supported in-town service created in 1979 amidst growing concerns over the fuel crisis and energy consumption. Since its inception, LEXPRESS has been an especially important resource for children and the elderly, who may otherwise have significant difficulty in getting around town. Scheduling incorporates the provision of transportation for students who participate in after-school activities.

The LEXPRESS service uses three minibuses operating on three pairs of routes. The routes are circular through various neighborhoods and to the Burlington Mall. Each routes takes 30 minutes to complete and the use of one bus to serve two routes results in hourly headways on each route. Buses operate out of a hub at Depot Square in the Town Center. The MBTA bus routes described above have stops at Depot Square. LEXPRESS weekday routes start at 6:45/7:15 AM and end at 6:00/6:30 PM. Saturday routes start at 10:00/10:30 AM and end at 5:00/5:30 PM. There is no Sunday service and no Saturday service during July and August.

LEXPRESS provides limited connections to bus services in neighboring communities. There are connections at the Burlington Mall (Route 6) to the Lowell Regional Transit Service and to Burlington's B-Line. The connecting times are 20 to 30 minutes. The Route 2 bus provides connecting service to the Waltham Citibus at Avalon at Lexington on Waltham Street. Connecting times to Waltham are 15 minutes and connecting times from Waltham are 10 minutes. Travel time, including connections, is 45 minutes to Waltham Center and 35 minutes from Waltham Center.

LEXPRESS carries over 300 passengers each weekday and approximately 80,000 passengers annually. Ridership rebounded in fiscal year 2002 after a steady decline the previous three years (see Table 2). The majority of passengers (61 percent) are students. Eighteen percent are seniors and 21 percent are adult riders. There are typically 10 to 15 transfers each day between LEXPRESS buses and one or two transfers each day between LEXPRESS buses and the Waltham Citibus or the Burlington B-Line service.

Table 2
LEXPRESS Ridership by Rider Type

Rider Type	FY99	FY00	FY01	FY02
Adults	19,423	21,971	17,161	16,537
Students	51,075	40,042	43,929	47,323
Seniors	15,822	15,246	13,841	13,787
Children	1,265	1,257	511	424
Total Ridership	87,585	78,516	75,442	78,071

As of this writing, LEXPRESS funding for the fiscal year 2004 is in jeopardy. If the budget override is not approved by residents, LEXPRESS will lose its funding. Securing adequate funding is a perennial concern in public transportation. Budget uncertainties complicate the process of maintaining and strengthening service. Currently, 25 percent of LEXPRESS's budget

is dependent upon the tax levy. Grant money from the MBTA and fare collection account for 25 percent each of the total budget, while another quarter comes from municipal parking revenues. The loss of nearly a quarter of the budget would likely necessitate the suspension or, possibly, termination of service. If service were interrupted, reinstituting it would be a politically complex and expensive prospect. The Town of Lexington was an area leader in recognizing the importance of local transit service and it is to be hoped that residents will continue to support this valuable service.

Paratransit Service

In addition to the MBTA-run "Ride", two other paratransit services are available to Lexington residents. The Chair Car complements the LEXPRESS service for those physically unable to access the fixed route service. The other service is a volunteer-run program known as "FISH" (Friendly Instant Sympathetic Help).

The Chair Car program operates Tuesdays and Thursdays from 9:30AM to 2:30PM. Ridership was 834 in FY2001 and 382 in FY2002. The majority of ridership occurs on the weekly shopping trip to Stop & Shop.

The FISH program provides occasional rides to doctor's offices and grocery stores.

Commuter TMA Service

The 128 Business Council is a regional transportation management association (TMA) of firms, residential complexes and office parks. The Council operates six commuter shuttle routes for its member companies which subsidize the service. Employees can ride free or purchase tickets, depending on the amount subsidized by the company.

Several Lexington locations are served by the 128 Council's Alewife Shuttle. The route provides service between the Alewife MBTA Red Line station in Cambridge and Waltham/Lexington companies along the Spring Street and Hayden Street corridor. The service operates nine runs between 6:40 and 10:05 AM, and has four trips in the evening between 4:15 and 7:15 PM. Travel time between Hayden Avenue and Alewife station is approximately 15 minutes.

Table 3. Alewife Shuttle Ridership, 2002, Lexington Stops

Address	Stop	Total Ridership, 2002	Daily Average
33 Hayden Ave	Mercer	1287	5.148
45 Hayden Ave	Spyglass	891	3.564
55 Hayden Ave	Hayden Woods	159	0.636
65 Hayden Ave	Cubist	4245	16.98
92 Hayden Ave	HCP	743	2.972
92 Hayden Ave	Other	177	0.708
95 Hayden Ave	Fresenius Medical Care	2464	9.856
95 Hayden Ave	Other	20	0.08
95 Hayden Ave	Verbind	180	0.72
191 Spring St	StrideRide	3175	12.7
128 Spring St	Phylos	1097	4.388
All Lex. Stops		14438	57.752

An examination of Alewife Shuttle ridership data for the year 2002 clearly shows that existing programs are having relatively little impact on the total volume of personal automobile trips. While the Shuttle is not totally ineffective, current usage is not of a scale to significantly improve traffic conditions.

Liberty Ride

While tourism has many benefits for Lexington, the issues of parking availability in Lexington Center, and a lack of appropriate parking for tour buses in particular, can be problematic. To address these issues, as well as to support tourism, the Liberty Ride, a shuttle bus offering on-board narration and stops at multiple tourist destinations, was instituted in the summer of 2002.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) focuses on providing alternative means of travel to driving alone in a car. The purpose of TDM is to enhance mobility by providing an expanded array of travel options and to reduce the demand for roadway improvements by reducing automobile travel. The latter is accomplished by inducing drivers to shift to non-driving modes or by encouraging people who drive alone to share a ride. TDM programs support and encourage ridesharing, transit use, walking, and bicycling. TDM programs are often implemented by groups of employers with a large number of employees in an identifiable area. Employers often pool their resources by establishing a Transportation Management Association (TMA), which can be the vehicle for delivering TDM services.

TDM Bylaw and TDM Policy

Unlike many other communities in Eastern Massachusetts, Lexington many years ago recognized the need to consider the transportation impacts of new development and to encourage and support the implementation of TDM measures.

Article XII of Chapter 135 of the Code of the Town of Lexington, Traffic, sets out minimum criteria for requiring traffic studies and mitigation of traffic impacts caused by a proposed development. For applicable developments, building permits shall not be granted until the SPGA[8] has determined that there is adequate traffic capacity for the new development. Applicable developments include commercial establishments over 100,000 square feet, new housing developments with 25 units or more, and other activity that generates 50 or more new vehicle trips per day, Where negative impacts occur, a variety of mitigations, from signalization of intersections to membership in a Transportation Management Association, can be required.

In addition, in March 1997, the Planning Board adopted a TDM Policy, which is much more detailed than Article XII. The thresholds for TDM are the same as those triggering traffic impact studies. Developers must provide a written TDM plan, which includes measures selected from a variety of transportation services outlined in nine categories in the policy. These include site design, transportation information, and connections to transit. A reporting component is detailed in the policy.

Monitoring and enforcement of special permit conditions under Article XII have been complicated by the lack of a clear and funded enforcement responsibility in the municipal organization. While Article XII and the TDM Policy are fairly clear on the reporting procedure, special permit conditions as actually written have varied significantly from case to case. As some developers are instructed to submit annual transportation reports to multiple departments, no one department has taken responsibility for ensuring that reports are submitted promptly and in sufficient detail. Similar confusion surrounds other special permit conditions. The result of this is that many existing developments are not fully complying with special permit conditions.

Transportation Management Association

[8] Special Permit Granting Authority – The SPGA is usually the Planning Board or Zoning Board of Appeals.

The 128 Business Council operates employer shuttles in the 128/West area and assists employers with their employee commuting needs. In Lexington, the 128 Business Council has worked with employers on Spring Street and Hayden Avenue to establish transportation options, including shuttles, Guaranteed Ride Home programs, establishment of carpools and vanpools, hold transportation awareness fairs, and assist the designated employer transportation coordinators for individual firms.

Since 1996, Transportation Coordinators have made three attempts to establish a TMA on Hartwell Avenue area. The most recent effort began in the autumn of 2001 and continues. Current Hartwell TMA planning is a joint effort of the Transportation Coordinator, Economic Development Officer, and the 128 Business Council.

The need for such an organization is clear. The Hartwell area is comprised of more than 140 businesses. Approximately 10,000 commuters travel to and from the area daily. By and large, these commuters drive single-occupancy vehicles. Traffic is problematic during peak commute hours, particularly at the intersection of Hartwell Avenue and Bedford Street. A TMA presence would be a great boon to the area.

Other TDM Related Measures and Information

The success of TDM measures depends heavily on the existence of complementary services and infrastructure. These include a well-planned and maintained sidewalk and street network, provision of local and regional transit, and complementary land uses that provide increased opportunity to walk and bicycle, sidewalks, and bicycle facilities. If these services and facilities are limited or non-existing, TDM support measures will be limited or ineffective For employees to be able to use private shuttle buses, they will first have to get to the shuttle – perhaps by train or bicycle. If there are shops and services within walking distance of their workplace, employees will be more willing to commute by alternative means of transportation.

BICYCLING AND WALKING

Lexington has a network of bicycle trails and paths and sidewalks that facilitate bicycling and walking not only as a form of recreation but also as a mode of travel. The Town is fortunate to have the Lexington Bicycle Advisory Committee (LBAC), which has done much to expand the bicycle network and inventory the sidewalk network. More generally it provides active support and encouragement of bicycle use and walking.

The existing bicycle network is divided into off-road bicycle trails and on-road recommended routes. Recommended routes are judged to be both relatively convenient to major destinations and fairly safe, although caution is urged at all times. Bicycle trails are generally on town-owned land or easements through private land and offer access to recreational facilities and open space.

The most well known bicycle facility in the community is the Minuteman Commuter Bikeway which runs generally north of, and parallel to, Massachusetts Avenue through much of the town. The Bikeway is a production of the Rails to Trails program and follows the former B & M rail corridor. The Bikeway runs from the MBTA Alewife Red Line station in Cambridge to Bedford. It traverses Lexington from Arlington just north of Massachusetts Avenue to Bedford just north of Maquire Road. It runs through Lexington Center just behind Depot Square. It is a heavily used facility that draws large summertime crowds to Lexington Center. In the wintertime, it is not plowed so that it can be used by cross-country skiers. While ridership figures are unavailable for the Minuteman Bikeway, it is generally reputed to be among the most successful rail trail conversions in the country.

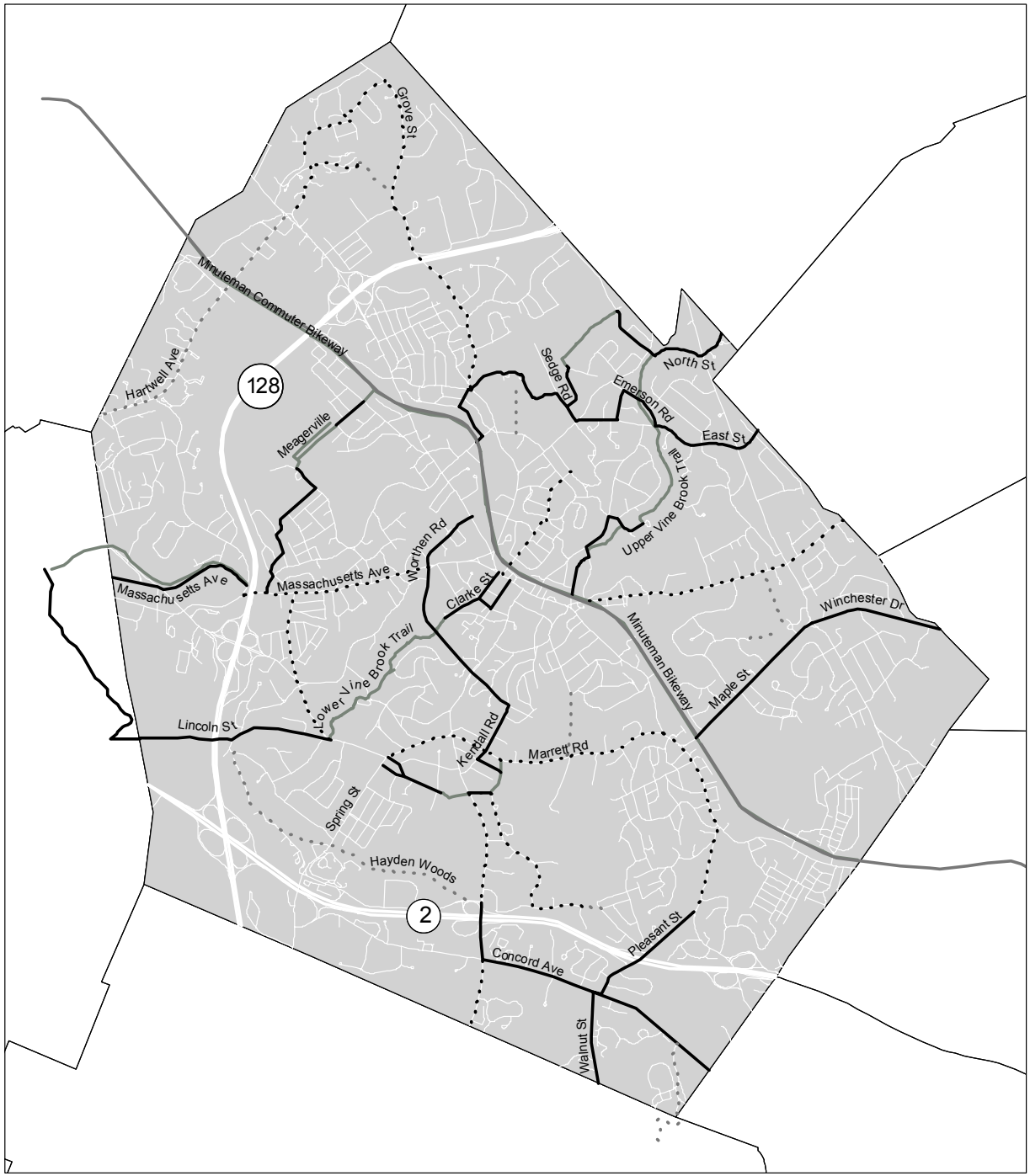
The town has developed additional off-road paths and on-street routes to link Lexington neighborhoods with the Town Center and the Minuteman Bikeway. Map 4 shows a plan of existing bike routes and bikeways in town.

The LBAC is continually involved in efforts to identify and secure additional routes with an emphasis on serving major in town attractions such as public schools. This is made difficult both by Lexington's physical form and political tradition. Lexington is a mature suburb, and as such, has relatively little space for infrastructure expansion. Streets are typically narrow, houses are fairly close to the street, and much remaining undeveloped land is reserved for conservation. The question of whether bike trails are appropriate uses in conservation areas has not been fully settled. In addition, certain neighborhoods have opposed the construction of sidewalks or bike lanes in the past. Future efforts will need to clearly state the need for such improvements and work to gain community support.

A recent major effort of the committee focused on a sign inventory. The purpose was to identify where signage needed to be replaced or added to make sure there was clear identification of the existing bike route system.

The town has also been using Geographic Information System to develop a sidewalk inventory which is shown on Map 5. Sidewalks are concentrated in the town center and nearby neighborhoods and adjacent to public schools. The presence of sidewalks in other areas is less uniform with some lower density residential areas having few if any sidewalks. The Town has no

Map 4. Bike Routes and Trails, Existing and Proposed.



Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington

'Recommended Routes' are roads which are recommended for cyclists, while 'Bicycle Trails' are off-road paths generally closed to motorized vehicles. Many links in the proposed network do not yet exist.

Legend

- Recommended Routes
- Bicycle Trails
- Future Routes
- Future Trails

2000 0 2000 Feet

Map 5: Sidewalk Inventory

While we believe this map to be substantially correct, it should be noted that it has not been field-checked.

Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington, MassHighway, Boston Edison

capital program or plan for expanding the sidewalk network. Subdivision regulations establish requirements for sidewalks in new development but with much of the Town already developed, a plan and program will be needed to insure the expansion of sidewalks into areas which need them or should have them.

The opportunities for bicycle and pedestrian improvements are many. Bicycling and walking are low-cost, healthy, environmentally friendly means of transportation and recreation. They also play an important role when other modes of transportation are used, whether one bikes to the bus stop or walks from a municipal parking lot.

CONCLUSION

In general, Lexington is fairly well-provided with transportation options. It is nevertheless experiencing growing traffic congestion and associated problems. This is due in some part to larger social and regional trends, and in some part to the choices that the town has made. Nationally, people have been making more trips, traveling longer distances, and spending more time behind the wheel. Regionally, the high cost of housing has pushed residential development further and further out, creating longer commutes. Locally, Lexington has failed to advance a proactive agenda to make alternative transportation a more attractive prospect. Major sidewalk improvements, for example, have been repeatedly postponed over the last 20 years. An investment made in 1983 could have resulted in a more walkable community by 2003.

While limited funding and political realities will make hard choices necessary, the threat to quality of life in Lexington needs to be addressed. Improvements must be made in order to allow greater access to existing transportation options, to improve the quality of those options, and to mitigate safety and operational problems with the roadway system. These improvements cannot be made by the municipal government acting alone. The transportation system is of such complexity that collaboration with private businesses, community groups, and regional, state, and possibly federal authorities is necessary. In the following chapters, we analyze possible strategies and develop recommended courses of action.



Consideration of Strategies

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[1]
2. Bedford Street at Harrington Road and Hancock Street	National Register, historic district

[1] 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.

Table 3: Intersection Improvement Alternatives

Intersection	Currently Unsignalized or Signalized (U/S)	Action Items		Number of Accidents[2]	Improves Roadway Safety	Addresses Capacity Problems[6]	Cost	Area Character	Enhances Pedestrian/Bicycle Safety	Impacts to Adjacent Land Uses	Maintenance Issues		Comments
			☐		Significantly improved	Significantly improved	Low	Improves character	Significantly enhanced	No impact	Low maintenance	☐	
			×		Slightly improved	Slightly improved	Moderate	Maintains character	Slightly enhanced	Minor impact	Moderate maintenance	×	
			●		Not improved	Not improved	High	Diminishes character	Not enhanced	Major impacts	High maintenance	●	
Bedford Street at Hartwell Avenue	S	Modify phasing: split eastbound Hartwell and westbound Bedford jughandle so they run separately.(Near Term)		83	☐	●	☐	×	×	☐	☐		Increases delay on mainline (Bedford Street). State numbered route.
		Provide three lanes on the jughandle (a shared left-turn/through lane and two through lanes) and four lanes o Hartwell (two exclusive left-turn lanes and two exclusive right-turn lanes). Upgrade traffic signal equipment. Implement new phasing and timing (including a split phas for Hartwell Avenue and the jughandle).(Long Term)[4,5]			☐	☐	●	×	☐	●	☐		Increases delay on mainline (Bedford Street). State numbered route.
Bedford Street at Eldred Street	U	Install traffic signal. Coordinate with signal at Hartwell Avenue. Widen Bedford to three lanes northbound. Install detectors to monitor queues from the southbound I-95/Route 128 exit ramp(Long Term).[5]		55	☐	☐	●	×	☐	●	×		Depending on volumes, third lane could come directly from Route 128 southbound off-ramp. State numbered route.
Marrett Road at Waltham Street	S	Install "Yield" sign at channelized right turn on southbound Waltham. (Near Term)		47	×	●	☐	×	●	☐	☐		State jurisdiction; state process required.
		Consolidate driveway access at Gulf Station on southwes corner and provide sidewalk.(Intermediate Term)			×	×	☐	☐	×	×	☐		State jurisdiction; state process required.
		Install signal warning on southbound Waltham Street due to limited sight distance. (Options: Graphic signal ahead sign or "Red Signal Ahead" automated sign) (Intermediate Term)			×	●	×	●	●	☐	×		State jurisdiction; state process required.
		Re-stripe Waltham Street northbound and southbound to provide an exclusive left-turn lane and shared through/righ turn lane. Install pedestrian heads and upgrade the signal equipment. Adjust signal timing and phasing(Long Term)[5].			☐	×	●	×	☐	☐	☐		State jurisdiction; state process required.
		Provide two approach lanes on eastbound Marrett Road (an exclusive left-turn lane and a shared through/right-turn lane). (Long Term)			☐	☐	●	●	×	●	☐		Provides opportunity for a right-turn overlap from southbound Waltham Street.State jurisdiction; state process required.
Maple Street at Massachusetts Avenue	U	Install traffic signal. Consider signalizing Marrett at Massachusetts Ave and coordinate the two systems(Long Term).[5]		44	☐	☐	●	●	☐	×	×		Difficult turns during peaks, unsafe pedestrian crossings.State numbered route.

1 Represents accidents occurring from 1999 through part of 2002. Compiled by the Town of Lexington Planning Department and Vanasse Hangen Brustlin from Town of Lexington Police Department records.

2 Near Term Actions represent items to be provided within 1-2 years. Consist of fairly low cost and easily installed improvements. The Near Term Action Items will most likely constitute improvements that are low in cost and high in effectiveness. The time line for Intermediate Term Action Items is 2-5 years. Long-Term Action items will be improvements that are high in capital investments, involve various parties (i.e. MassHighway, etc.), or may have a longer process to get implemented (i.e., require an Environmental Impact Report, etc.). The time line for the long-term improvements is 5 years or more.

3 A decision must be made on the left turn lane on Marrett Road prior to these improvements being carried forward so the intersection is designed accordingly.

4 Traffic counts and intersection analysis would need to be conducted to determine more details in the design of these improvements.

5 All signal installations should consider incorporating ornamental signal equipment.

6 Detailed traffic analysis would need to be conducted to determine the exact effectiveness these improvements would have on traffic operations.

7 A more detailed review of the curb lines and a determination of the location of the right-of-way would need to be conducted to determine the full impact on adjacent parcels of land.

Table 3: Intersection Improvement Alternatives

Intersection	Currently Unsignalized or Signalized (U/S)	Action Items		Number of Accidents[2]	Improves Roadway Safety	Addresses Capacity Problems[6]	Cost	Area Character	Enhances Pedestrian/Bicycle Safety	Impacts to Adjacent Land Uses	Maintenance Issues		Comments
			☐		Significantly improved	Significantly improved	Low	Improves character	Significantly enhanced	No impact	Low maintenance	☐	
			×		Slightly improved	Slightly improved	Moderate	Maintains character	Slightly enhanced	Minor impact	Moderate maintenance	×	
			●		Not improved	Not improved	High	Diminishes character	Not enhanced	Major impacts	High maintenance	●	
Maple Street at Lowell Street	S	Paint gore (zebra) striping around the islands with signal posts to better delineate the islands. (Near Term)		40	×	●	☐	×	●	☐	☐		Ped push buttons do not function. Non ADA-compliant ped xing. No mast arms(post mounted). No left arrow indication NB
		Paint left-turn lane on Maple Street (lane is already in operation) (Near Term)			×	×	☐	×	×	☐	☐		
		Upgrade signal equipment to provide protected left-turn phasing on northbound Lowell approach and pedestrian crossings. Upgrade pedestrian crossings to be ADA-compliant(Intermediate Term).[5]			☐	☐	×	×	☐	☐	☐		Ped push buttons do not function. Non ADA-compliant ped xing. Post mounted signals. No left arrow indication northbound. State numbered route.
		Investigate limited widening of Lowell Street approaches to provide an exclusive left-turn lane in each direction. Further analysis will be required to determine if widening can be accomplished with little or no impact to adjacent properties. (Long Term)			☐	☐	×	×	×	●	☐		State numbered route.
		Investigate limited widening of Winchester Street approach to provide an additional lane. Further analysis will be required to determine if widening can be accomplished with little or no impact to adjacent properties.(Long Term)			☐	☐	×	×	×	●	☐		State numbered route.
		Move channelized right-turn lanes closer to approaches. (Long Term)			×	×	×	☐	☐	☐	☐		Reduces the number of conflict points and slows vehicles prior to school pedestrian crossing on Maple west of the intersection. Provides a large swath for landscaping, etc. State numbered route.
Worthen Road at Bedford Street	S	Paint a crosswalk across Camelia Drive (sidewalk and ramps already provided) (Near Term)		30	●	●	☐	☐	☐	☐	☐		State numbered route.
		Restripe the Worthen Road approach with an exclusive left-turn lane and a shared through/right-turn lane. Implement a split phase operation of the traffic signal for Worthen Road and Camelia Drive. (Near Term)			☐	●	☐	×	☐	●	☐		Could delay Bedford Street a little when Camelia Drive approach is called. State numbered route.
		Provide an exclusive left-turn lane on northbound Bedford Road onto Worthen Road.(Intermediate Term)			☐	×	☐	×	×	×	☐		State numbered route.
Concord Avenue at Waltham Street	S	Restripe Waltham Street approaches for an exclusive left-turn and a shared through/right-turn lane. Approaches are approximately 43 feet wide. Retime traffic signal to provide more time for westbound Concord Avenue. (Near Term)		28	☐	☐	☐	×	×	☐	☐		
		Upgrade signal equipment to provide protected left-turn phases on Waltham Street(Intermediate Term).[4,5]			☐	☐	×	×	☐	☐	☐		

Table 3: Intersection Improvement Alternatives

Intersection	Currently Unsignalized or Signalized (U/S)	Action Items		Number of Accidents[2]	Improves Roadway Safety	Addresses Capacity Problems[6]	Cost	Area Character	Enhances Pedestrian/Bicycle Safety	Impacts to Adjacent Land Uses	Maintenance Issues		Comments
			☐		Significantly improved	Significantly improved	Low	Improves character	Significantly enhanced	No impact	Low maintenance	☐	
			×		Slightly improved	Slightly improved	Moderate	Maintains character	Slightly enhanced	Minor impact	Moderate maintenance	×	
			●		Not improved	Not improved	High	Diminishes character	Not enhanced	Major impacts	High maintenance	●	
		Widen westbound Concord Avenue to provide two lanes. Additional analysis would be necessary to determine the lane utilization of this approach(Long Term)[4].			☐	☐	×	●	×	×	×		
Massachusetts Avenue at Woburn Street/Winthrop Street	U	Install bulb-out on Woburn Street to reduce amount of pavement at the intersection and to slow and better channelize vehicles exiting Woburn Street onto Massachusetts Avenue. (Near Term)		26	☐	●	×	☐	☐	☐	×		
		Extend island westward to prohibit vehicles from crossing Massachusetts Avenue between Winthrop Street and Woburn Street.(Near Term)			☐	☐	×	☐	☐	☐	☐		Restricts access for Winthrop Road.
		Implement a right-in/right-out only policy on Winthrop Street. Restrict left turns from Massachusetts Avenue onto Woburn Street via the eastern leg of triangle by extending the island. (Near Term)			☐	☐	×	☐	☐	☐	☐		Restricts access for Winthrop Road.
		Paint left-turn lane on eastbound Massachusetts Avenue.(Near Term)			×	×	☐	×	×	☐	☐		Parking may need to be removed.
		Install modern roundabout (Long Term)			☐	☐	●	☐	☐	×	×		
		Install traffic signal(Long Term)[5].			☐	☐	●	●	☐	×	×		
Pleasant Street at Massachusetts Avenue	U	Install modern roundabout (Long Term)		18	☐	☐	●	☐	☐	×	×		Difficult turns during peaks, unsafe pedestrian crossings.
		Install traffic signal. Extend curb lines to better delineate intersection(Long Term)[5].			☐	☐	●	●	☐	×	×		Difficult turns during peaks, unsafe pedestrian crossings.
Pleasant Street at Watertown Street	U	Install modern roundabout (Long Term)		13	☐	☐	●	☐	☐	×	×		
		Install traffic signal(Long Term)[5]			☐	☐	●	●	☐	×	×		Sight distance issues, queues block turning movements,driver indecision
Massachusetts Avenue at Wood Street	U	Install a short right-turn lane on Wood Street with possible limited widening. (Intermediate Term)		11	×	×	×	●	×	×	☐		

Table 3: Intersection Improvement Alternatives

Intersection	Currently Unsignalized or Signalized (U/S)	Action Items		Number of Accidents[2]	Improves Roadway Safety	Addresses Capacity Problems[6]	Cost	Area Character	Enhances Pedestrian/Bicycle Safety	Impacts to Adjacent Land Uses	Maintenance Issues		Comments
			□		Significantly improved	Significantly improved	Low	Improves character	Significantly enhanced	No impact	Low maintenance	□	
			×		Slightly improved	Slightly improved	Moderate	Maintains character	Slightly enhanced	Minor impact	Moderate maintenance	×	
			●		Not improved	Not improved	High	Diminishes character	Not enhanced	Major impacts	High maintenance	●	
		Widen Wood Street to provide two full approach lanes (a left-turn lane and a right-turn lane) and an adequate departure lane. Widen toward I-95/Route 128. (Long Term)			□	×	●	●	×	●	□		
Spring Street at Marrett Road[3]	U	Install an island on northbound Spring Street to better channelize vehicles entering and exiting Spring Street. (Intermediate Term)		7	□	×	×	□	□	□	×		
		Extend northwest corner of Spring Street to reduce the width of eastbound Marrett Road and to improve channelization. (Intermediate Term)			□	×	×	□	□	□	×		
		Extend curb from one-way Bridge Street toward Marrett Road to reduce the amount of pavement and to better channelize vehicles. (Intermediate Term)			□	×	×	□	□	□	×		
		Provide a separate left-turn lane on westbound Marrett Street. (Intermediate Term)			□	×	×	×	×	×	□		
		Install modern roundabout (Long Term)			□	□	●	□	□	×	×		

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.

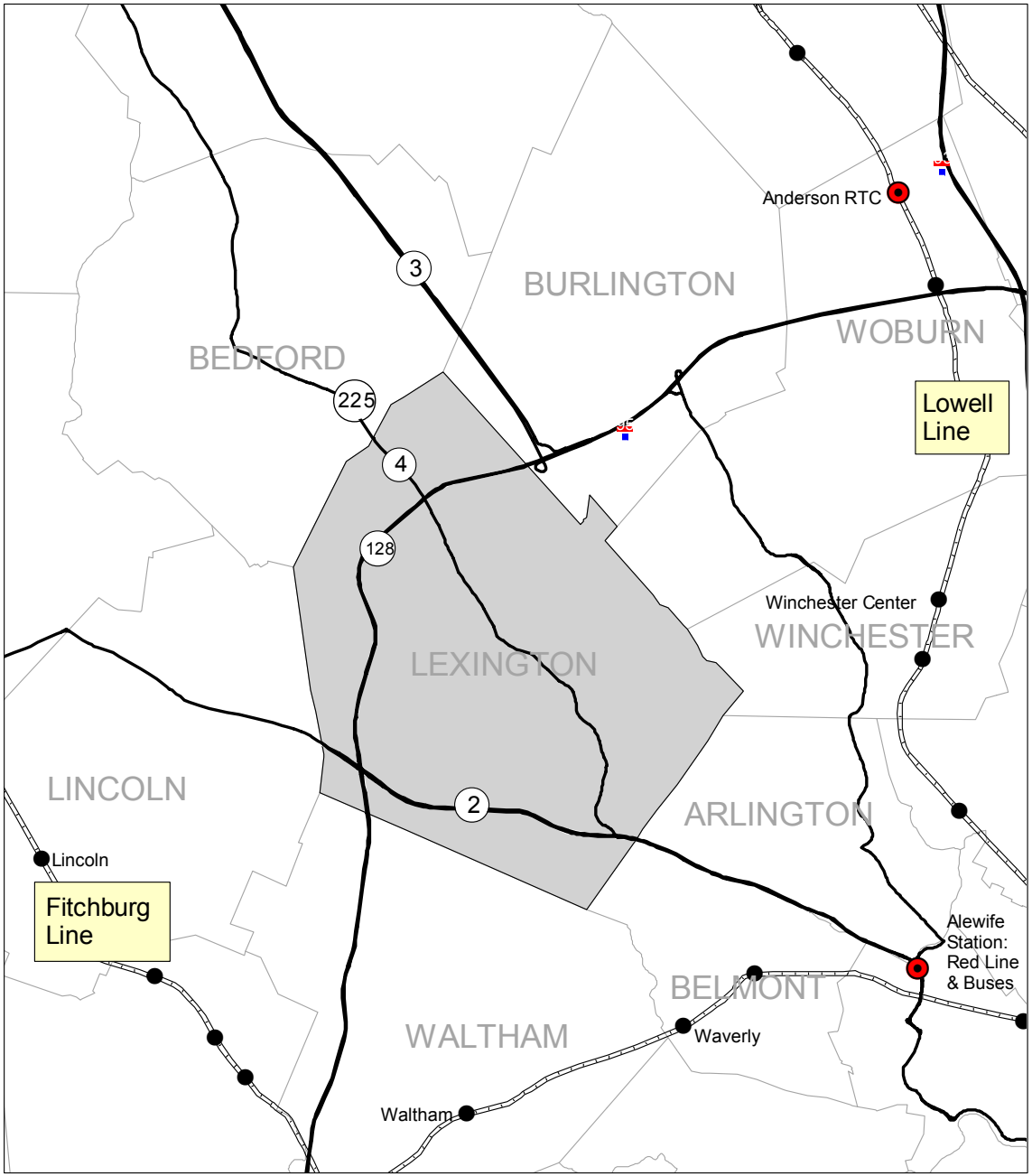
Based on the transit strategies described above, as well as analysis of relevant data, potential actions were identified and evaluated for inclusion in the Transportation Element. The following sections describe the actions listed above and indicate whether the TEAC supported inclusion of the measure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

Map 6. Regional Transportation Network: Major Roads and Commuter Rail



Prepared by Lexington Planning Department. Source: MassGIS, Town of Lexington

Legend

- Intermodal Facilities
- Commuter Rail Stations
- Train
- Municipal Boundaries

5000 0 5000 10000

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[2] 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.**

[2] 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

		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
  2. Posters in the Town Center, Community Centers, Public Buildings, etc.
  3. Transportation fairs
  4. Information kiosks
  5. Posters in office lobbies
  6. Flyers mailed with bills
  7. *Lexington Minuteman* 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[3] 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.

[3] 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[4] 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

[4] 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[5], 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.

[5] 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-20th 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

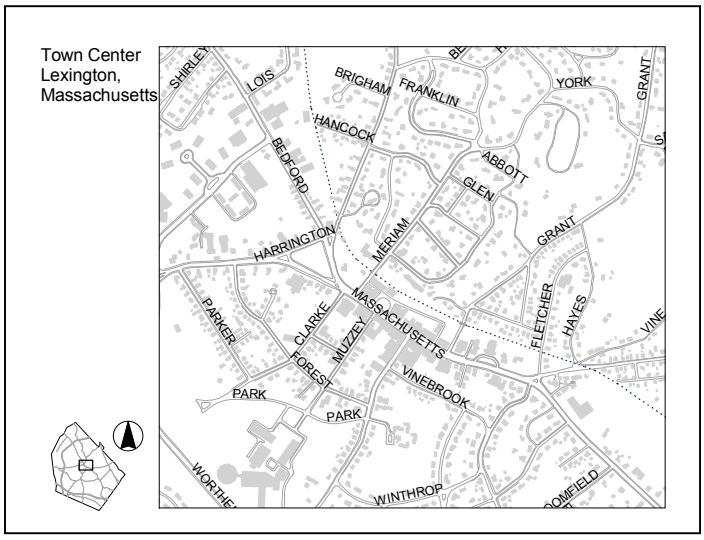
sweeping scale. The objectives with these kinds of land use/transportation strategies are more modest for an established community.

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

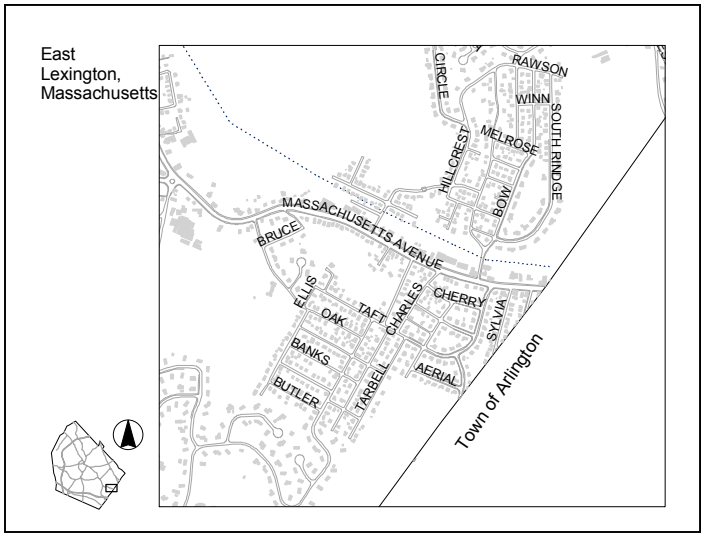
Potential Actions

- 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

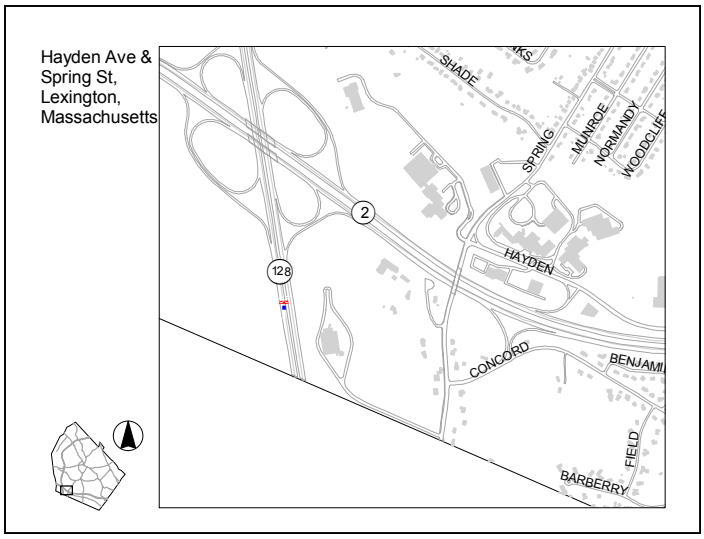
Issues/Observations

- 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.

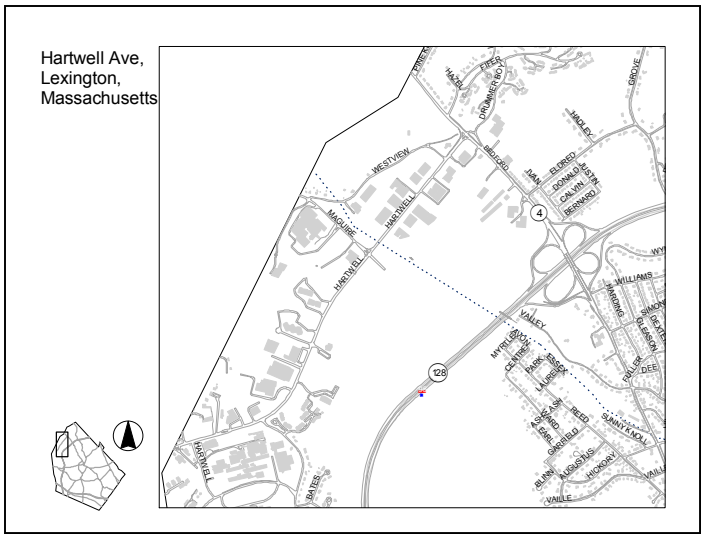
Potential Actions

- 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.

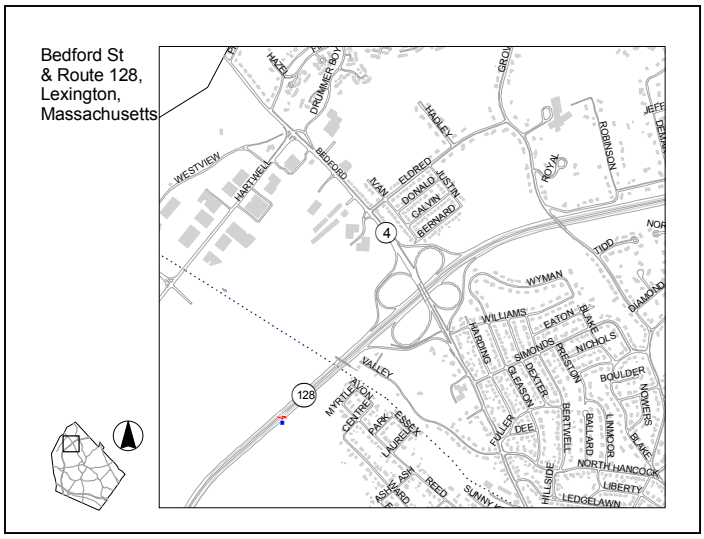
- Provide improvements possibly by means of a betterment district along the length of Hartwell Avenue and Maguire Road. **Included in Implementing Actions; Goal 6.A.3.**

- 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

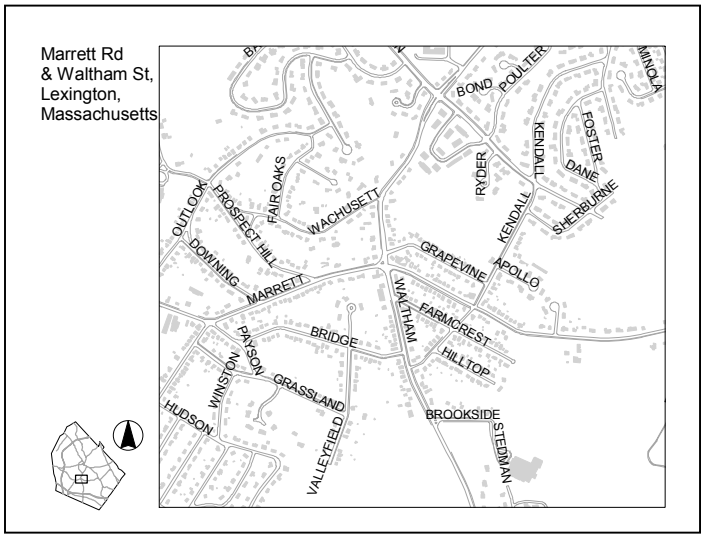
Issues/Observations

- 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

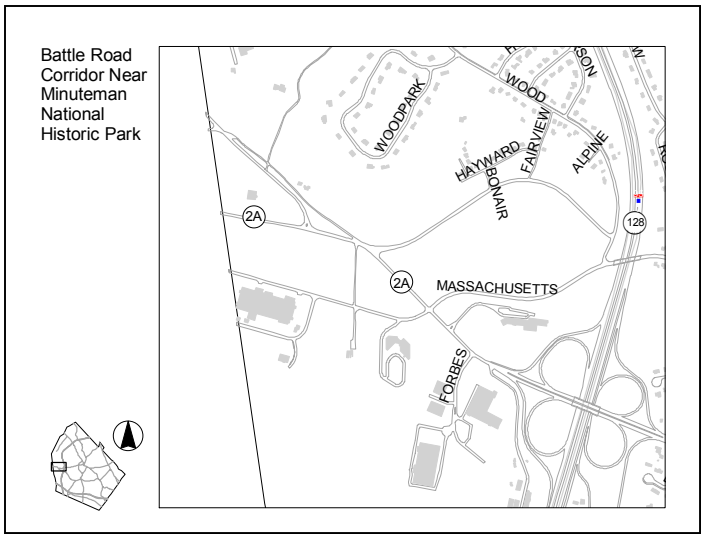
Issues/Observations

- 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

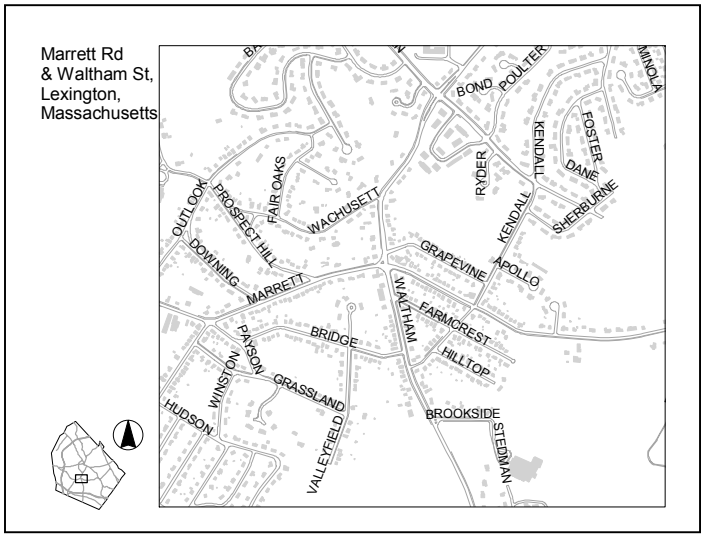
Issues/Observations

- 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.


Implementing Actions: The Plan

IMPLEMENTING ACTIONS

Implementation is a critical piece of any planning study. All too often, plan recommendations are ignored in day-to-day decision-making. To ensure that the research, analysis, and consensus building that went into this plan inform policy at multiple levels, we have set out the action items that emerged from this transportation planning process

The slate of short, medium and long term measures laid out in this document requires collaboration between constantly shifting sets of actors. We have attempted to identify primary and secondary actors for each action item. No single set of collaborators on a given measure is necessarily complete or ideal, but these designations are at least a start in identifying the "players" who can make it happen.

This section also is organized around the strategic goals and objectives that emerged from the process. This strategic aspect is the bond that ties all of the actions together, that allows the collective set of measures to make sense and work cohesively. Finally, the actions are further organized into time frames that represent the degree of constraint involved in getting the measure underway; some items can be achieved in a year or two, while some might take a decade or more. It does not mean that short term items are more important as public policy than the medium or long term ones; it simply makes sense to set the more easily achieved measures in motion. These time frames are further explained below.

Implementing actions in the Transportation Element are listed under four time frames for implementation: Ongoing, Near Term; Intermediate Term; and Long Term. Ongoing actions are those of a continuous nature with no set end date. Some of these measures might already exist, at least to a degree. Near Term actions are relatively simple, low cost measures, which can be undertaken in a short period of time with a limited amount of planning and permitting. Included with Near Term actions also are steps to initiate the planning and permitting processes required to implement Intermediate and Long Term actions. Intermediate Term actions are somewhat more costly and more difficult to implement than Near Term actions. Some design and permitting may be needed before they can be implemented. Intermediate Term actions could be implemented within a two to five year time frame. As with Near Term actions, some Intermediate Term actions may include initiating the development of Long Term actions. Actions anticipated to take longer than five years to bring to fruition are Long Term actions. They generally are higher cost actions requiring more extensive study, planning and permitting.

Because of the long lead time required to complete these actions, initiating the process to develop the actions may be included as a Near Term or Intermediate Term action.

It should be noted that the time frames in this element are somewhat longer than those in the first four elements of the Comprehensive Plan, as transportation improvements tend to not only involve multiple parties, but also complex land assembly and engineering and extensive public process.

Table 10. Implementation Time Frames

Category	Ongoing	Near Term (NT)	Intermediate Term (IT)	Long Term (LT)
Difficulty	Varies	Least Constraint	Medium Constraint	High Constraint
Initiating Time Frame	Continuous	1-2 years	2-5 years	5+ years
Cost	Varies	Low	Medium	High

Implementing actions are identified by goal, by implementing actor, and by time frame. The boards or officials that would best be responsible for initiating the action are identified in italics, followed by the time frame. These boards and officials include the Board of Selectmen, the Planning Board, the Zoning Board of Appeals (ZBA), the Town Manager, the Transportation Coordinator, and the Department of Public Works (DPW). Interested committees include the Lexington Bicycle Advisory Committee (LBAC), the Traffic Safety Advisory Committee, the Transportation Advisory Committee, the Historic Districts Commission, and the Design Advisory Committee. Under each board or official and within each category of action, actions are listed in order of priority, as established by the transportation planning process. The actor or actors in bold should be considered the lead in implementation.

It should be noted that these Implementing Actions assume an increased staffing level in the Transportation Services Section of the DPW. In the past, the section has been staffed by a full-time Coordinator and a half-time assistant. At that level, they were fully occupied by a wide range of duties - from municipal parking to paratransit. The Transportation Coordinator position, along with the LEXPRESS bus service, was eliminated for fiscal year 2004. Consequently, many of the action items listed below will need to be postponed until Transportation Services funding is again available.

1. GOAL: PRESERVE THE QUALITY OF LIFE IN LEXINGTON THROUGH IMPROVED TRAFFIC MANAGEMENT.

A. Reduce peak hour commuter traffic and tie-ups

B. Improve traffic safety in high-accident locations

The preceding two objectives are presented as they were articulated in the Vision 2020 process and the first four elements of the Comprehensive Plan. While important goals, they are so broad in scope that they encompass the majority of implementing actions below. To avoid redundancy, those actions are not repeated here.

See: Goals, Objectives, and Actions to follow throughout this section.

2. GOAL: INCREASE TRANSPORTATION ALTERNATIVES TO SINGLE OCCUPANCY VEHICLE TRIPS.

A. Increase availability of public transportation (local, regional and intercity).

1) Initiate limited bus service between Hartwell Avenue and the Lowell Commuter Rail Line at the Anderson Regional Transit Center in Woburn to test the feasibility of providing more extensive service. This could be combined with the route suggested in #4. ***Transportation Advisory Committee,*** *Board of Selectmen, Town Manager, Transportation Coordinator, MPO Representative, Planning Board;* ***NT***

2) Initiate bus service between Waltham Center and Lexington Center to provide access to the Waltham stop on the Fitchburg Commuter Rail Line; to provide peak hour service to Hayden Avenue and all day service to the Waltham Street/Lexington Street corridor; and to provide access to MBTA buses in Waltham Center. ***Transportation Advisory Committee,*** *Transportation Coordinator;* ***NT/IT***

3) Investigate the feasibility of extending the hours of operation and increasing frequency of service of Lexpress to serve a larger share of the town's population, including commuters. ***Transportation Advisory Committee****, Transportation Coordinator;* ***IT***

4) Initiate bus service between Winchester Center and Lexington Center to provide access to the Lowell Commuter Rail Line, which is planned to be extended to Nashua, New Hampshire; service to Countryside, Lexington Center and some Winchester neighborhoods; and connect with Winchester MBTA bus routes. ***Transportation Advisory Committee****, Transportation Coordinator, MPO Representative, Business Community;* ***LT***

5) Advocate for extension of MBTA bus route #78 to Hayden Avenue during peak hours in the event the 128 Council TMA Alewife Shuttle service is reduced or eliminated. ***Transportation Advisory Committee****, Transportation Coordinator, MPO Representative;* ***LT***

6) Advocate for extension of MBTA bus route #77 to Lexington Center to provide service for Arlington residents who work in Lexington. ***Transportation Advisory Committee****, Transportation Coordinator, MPO Representative;* ***LT***

7) Advocate for an increase in the frequency of service on MBTA routes 62 and 76, particularly during peak hours, to improve access between Alewife station and Lexington. ***Transportation Advisory Committee****, Transportation Coordinator, MPO Representative;* ***LT***

B. Increase use of bicycles.

1) Seek easements from public and private landowners to extend bicycle and pedestrian facilities. ***LBAC****, ZBA, Planning Board;* ***Ongoing***

2) Rigorously implement Town's Transportation Demand Management Policy to support walking and bicycling in and around new development and redeveloped sites. ***Transportation Coordinator,*** *LBAC, Planning Board, ZBA, Town Manager;* ***Ongoing***

3) Incorporate bicycle route plan map in the Comprehensive Plan and update regularly to reflect changing needs and opportunities. ***Planning Board****, LBAC;* ***NT***

4) Update bicycle route signage. ***DPW and LBAC****;* ***NT***

5) Encourage pedestrian and bicycle amenities, such as benches, bike racks, and bicycle lockers, at key locations especially along the Minuteman Bikeway. ***LBAC,*** *Planning Board, ZBA, DPW;* ***NT***

6) Identify satellite "park and bike" locations on the outskirts of town along the Minuteman Bike Path to relieve parking demand in the Town Center. ***LBAC****, Planning Board, DPW;* ***NT***

7) Define flexible standards for various types of bicycle and sidewalk facilties that are tailored to reflect the character of the community ***Design Advisory Committee and LBAC****, DPW, PB, Historic Districts Commission;* ***NT***

8) Develop and implement zoning regulations to support and encourage walking and bicycling. ***Planning Board****, LBAC, Economic Development;* ***NT***

C. Increase employer based transportation demand management programs and employee incentives to use them.

1) Review and revise Article XII of the Zoning Bylaw[1] for better enforcement and monitoring. ***Planning Board****, ZBA*

2) Support carpooling by Lexington residents and by employees working in Lexington. ***Transportation Coordinator and Business Community,*** *Transportation Advisory Committee, Planning Board;* ***NT***
   - Expand on existing area programs
   - Promote ridematching services offered by CARAVAN for Commuters and/or the 128 Business Council
   - Collect information, conduct outreach, and implement marketing strategies.
   - Seek financial incentives for carpoolers/vanpoolers.

[1] Article XII, Traffic, sets thresholds for development, beyond which traffic studies, mitigations, and TDM measures can be required.

3) Provide information on alternative commuting choices. ***Transportation Coordinator and Business Community****, Route 128 Business Council;* ***NT***
   - Work with other officials, as well as private sources, to establish an effective and comprehensive marketing program utilizing a variety of methods.

4) Work with 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 transportation resources, including MBTA, CARAVAN, and the 128 Business Council. ***Transportation Coordinator****, Transportation Advisory Committee, Business Community, Route 128 Business Council, MIS;* ***NT***

5) Provide financial and non-financial incentives for alternative modes of travel by offering T-passes, Lexpress tickets, gas coupons or preferential parking for carpoolers, or other means. ***Transportation Coordinator and Business Community****;* ***IT***

6) Establish TMA Services: assist employers in joining Transportation Management Associations or forming new ones where appropriate. ***Transportation Coordinator and Business Community****, Transportation Advisory Committee, 128 Business Council;* ***IT***

7) Provide small-scale services in office parks. ***Business Community****, Economic Development Officer, Planning Board;* ***NT***

   - Encourage small businesses to use lunch trucks to bring lunch to employees to provide an option to driving to lunch.

   - Encourage small businesses, such as day care, ATM, dry cleaning, snacks and sundries to locate within office parks. (see also Goal 6, Objective A)

8) Investigate providing improvements by means of a betterment district along the length of Hartwell Avenue and Maguire Road. ***Board of Selectmen and DPW***; IT

D. Increase pedestrian activity.

1) Develop and implement zoning regulations to support and encourage walking and bicycling. ***Planning Board****, LBAC, Economic Development;* ***NT***

2) Pursue a 3E (Education, Encouragement and Enforcement) program for students and the larger community in support of walking and bicycling to encourage a comprehensive approach. ***School Committee****, LBAC, Transportation Coordinator, Board of Health;* ***NT***

See also: Goal 4, Objective C

E. Increase school bus usage and reduce traffic at schools. Discourage driving to school by providing incentives to use other modes.

1) Promote use of LEXPRESS for transportation from after-school activities. ***School Committee****, Transportation Advisory Committee, Transportation Coordinator; Ongoing*

2) Implement a pilot Safe Routes to School Program to test the concept for possible adoption of a town wide program. ***School Committee and LBAC****, Transportation Coordinator, Board of Health, PTO;* ***NT***

3) Investigate feasibility of providing incentives for students to commute by walking, biking, bus, or carpool through preferential dismissal or other means. ***School Committee****, PTO, Transportation Coordinator;* ***NT***

3. GOAL: USE PARKING STRATEGIES TO HELP ACHIEVE TRANSPORTATION GOALS AT CERTAIN LOCATIONS

A. Amend parking requirements so as to avoid excessive parking supply for commercial and industrial uses.

1) Study existing parking regulations to assess impact on transportation choice; consider revision. ***Planning Board,*** *Business Community;* ***IT***
2) Provide incentives to reduce parking demand and automobile use. ***Planning Board****, Transportation Coordinator;* ***IT***
   - Explore federal, state, or local tax breaks or other sources of funds for reimbursing employers based on actual cash-back
   - Establish a parking cash-out program for employers.

B. Reduce vehicular trips from High School.

See: Goal 2, Section E

4. GOAL: IMPROVE AND BETTER MAINTAIN THE INFRASTRUCTURE

A. Institute a capital improvements plan for traffic calming at strategic locations.

See: Goal 4, Objective B, particularly as regards roundabouts, bulb-outs, and crosswalks.

B. Improve road conditions.

1) Initiate planning for the following long-term roadway improvement (***DPW****, Board of Selectmen, Capital Budget Committee;* ***NT***):
   - Improvements at Marrett Road and Waltham Street (currently underway)
   - Improvements at Bedford Street and Hartwell Avenue (see description under long-term improvements)

2) Implement traffic improvements at the following intersections *(**DPW**, Board of Selectmen, Town Manager)*:

Near Term

Hartwell Avenue and Bedford Street

- Modify the traffic signal phasing to provide separate phases for the eastbound Hartwell Avenue and westbound Bedford Street jughandle approaches.
- Allow right turns from the southbound jughandle approach.

Waltham Street and Marrett Road

Install a "Yield" sign at the channelized right turn on southbound Waltham Street.

Maple Street and Lowell Street

- Paint gore (zebra) striping around the islands with signal posts to better delineate the islands
- Paint a left-turn lane on Maple Street (lane is already in operation).

Worthen Road and Bedford Street

- Paint a crosswalk across Camelia Drive (sidewalk and ramps already in place).

Intermediate Term

Marrett Road at Waltham Street

- Consolidate driveway access at Gulf Station on southwest corner and provide sidewalk.
- Install signal ahead sign on southbound Waltham Street due to limited sight distance.

Maple Street at Lowell Street

- Upgrade signal equipment to provide protected left-turn phasing on northbound Lowell Street approach and pedestrian crossings.
- Upgrade pedestrian crossings to be ADA-compliant.

Concord Avenue at Waltham Street

- Upgrade signal equipment to provide protected left-turn phases on Waltham Street.

Spring Street at Marrett Road

- Install an island on northbound Spring Street to better channelize vehicles entering and exiting Spring Street.
- Extend northwest corner of Spring Street to reduce the width of eastbound Marrett Road and to improve channelization.
- Extend curb from one-way Bridge Street toward Marrett Road to reduce the amount of pavement and to better channelize vehicles.
- Investigate the feasibility of providing a separate left-turn lane on westbound Marrett Street within the existing right-of-way.

Worthen Road at Bedford Street

- Provide an exclusive left-turn lane on northbound Bedford Street.

Massachusetts Avenue at Woburn Street/Winthrop Street

- Install bulb-out on Woburn Street to reduce amount of pavement at the intersection and to slow and better channelize vehicles exiting Woburn Street onto Massachusetts Avenue.
- Extend island westward to prohibit vehicles from crossing

Long Term

Bedford Street at Hartwell Avenue

- Widen the jughandle approach to provide three lanes (a shared left-turn/through lane, a through lane, and a shared through/right-turn lane).
- Widen the Hartwell Avenue approach to four lanes (two exclusive left-turn lanes and two exclusive right-turn lanes)
- Widen the Bedford Street approaches to two full lanes in each direction.
- Upgrade traffic signal equipment and implement new phasing and timing (including a split phase for Hartwell Avenue and the jughandle).

Bedford Street at Eldred Street

- Install traffic signal and coordinate with signal at Hartwell Avenue[2].
- Widen Bedford Street northbound approach to three lanes.
- Install detectors to monitor queues from the southbound I-95/Route 128 exit ramp.

Marrett Road at Waltham Street

- Re-stripe the Waltham Street northbound and southbound approaches to provide an exclusive left-turn lane and shared through/right-turn lane.
- Provide two approach lanes on eastbound Marrett Road (an exclusive left-turn lane and a shared through/right-turn lane).
- Upgrade the signal equipment, including installation of pedestrian signal heads, and adjust signal timing and phasing.

Maple Street at Massachusetts Avenue

- Install traffic signal.
- Consider signalizing Marrett Street at Massachusetts Ave and coordinating the two systems.

Maple Street at Lowell Street

- Investigate limited widening of Lowell Street approaches to provide an exclusive left-turn lane in each direction and determine if widening can be accomplished with little or no impact to adjacent properties.
- Investigate limited widening of Winchester Street approach to provide an additional lane and determine if widening can be accomplished with little or no impact to adjacent properties.
- Reconfigure channelized right-turn lanes to slow traffic and provide easier pedestrian crossings.

Concord Avenue at Waltham Street

- Widen westbound Concord Avenue to provide two lanes. Additional traffic analysis will be necessary to determine the appropriate lane utilization for the widened approach.

Massachusetts Avenue at Woburn Street/Winthrop Street

- Install traffic signal or modern roundabout.

Pleasant Street at Massachusetts Avenue

- Install traffic signal or modern roundabout.

Pleasant Street at Watertown Street

[2] There is concern that this will attract cut-through traffic to Eldred St, which could impact its status as a proposed bicycle route. Any signalization project should study this possibility and its impacts.

- Install traffic signal or modern roundabout.

Spring Street at Marrett Road

- Install modern roundabout

C. Improve and expand sidewalk network.

1) Write and adopt policy on importance of creating and maintaining sidewalks for safety, health, and mobility. ***Planning Board and Board of Selectmen and DPW; NT***

2) Update and maintain sidewalk inventory ***DPW; IT***

3) Develop prioritization strategies and screening criteria for sidewalk improvements *DPW;* ***IT***
   - Include consideration of major pedestrian generators such as schools and senior centers.
   - Consider pedestrian safety.

4) Consider identifying criteria for roadways where sidewalks may be constructed on only one side. ***Planning Board,*** *LBAC, DPW;* ***IT***

5) Create Task Force to study retrofit of Hayden Avenue, the commercial area of Spring Street, and the Hartwell Avenue commercial area with non-automotive infrastructure. ***Economic Development Officer,*** *Board of Selectmen, Business Community, DPW;* ***IT***
   - Provide multi-purpose trails for pedestrians and bikes
   - Reduce front setbacks to encourage transit, TDM and pedestrian use
   - Orient building entrances to the street
   - Provide bus pullouts and shelters
   - Provide for on-site multi-passenger vehicle drop-off/pick-up areas at individual businesses.

D. Improve bicycle path conditions.

1) Maintain consistency in bicycle and pedestrian facilities. ***DPW and LBAC; Ongoing***
2) Enforce snow removal policies and provide periodic sweeping of such facilities. ***Town Manager****, DPW, private abutters;* ***Ongoing***
3) Incorporate bicycle needs in roadway projects. ***DPW****, Capital Budget Committee, Planning Board, LBAC;* ***Ongoing***
4) Use bicycle needs in weighing priorities for roadway projects. ***DPW****, Capital Budget Committee, Planning Board, LBAC;* ***Ongoing***

5. GOAL: INVOLVE LEXINGTON IN LOCAL AND REGIONAL TRANSPORTATION PLANNING

A. Increase involvement by Lexington in regional planning.

1) Coordinate with Boston MPO and MPO Advisory Committee to monitor regional projects. ***MPO Representative**; **Ongoing***

2) Monitor Hanscom/Massport transportation impacts. ***Planning Board**, HATS; **Ongoing***

3) Communicate directly with abutting towns on traffic aspects of developments of regional impact. ***Planning Board**; **Ongoing***

4) Participate in MAGIC[3] regional transportation planning efforts. ***MAGIC Representative**, Transportation Coordinator, Transportation Advisory Committee; **Ongoing***

B. Improve access and coordination with regional transportation centers and airports (i.e. Woburn, Alewife, Route 128)

See: Goal 2, Objective A: "Increase availability of public transportation (local, regional, and intercity."

C. Coordinate local planning efforts.

Coordinate implementation and updating efforts with the Selectmen's ongoing Vision 2020 long-range planning effort. ***Planning Board,** Board of Selectmen, 2020 Vision Implementation Committee**; Ongoing***

6. GOAL: INVESTIGATE LAND USE POLICIES THAT CAN ASSIST WITH TRANSPORTATION GOALS

A. Identify nodes and areas served by public transportation that might be logical for prudent planned development designations and greater mix of uses.

1) Plan for the future of the former Raytheon site (141 Spring St) with potential for a cohesive mixed-use development including office, limited commercial, R&D, and conservation/recreation uses. ***Economic Development Officer,** Planning Board; **NT***

2) Consider creating a Business Improvement District to address transportation and parking issues, among others, in the Town Center. ***Economic Development Officer,** Board of Selectmen, Lexington Center Committee, Chamber of Commerce, Traffic Safety Advisory Committee; **IT***

[3] Minuteman Advisory Group on Interlocal Coordination, a subset of the Boston Metropolitan Planning Organization

3) Create an Overlay District for Hartwell Avenue Area that allows a modest Floor-Area-Ratio (FAR) increase if tied to a commitment for an overall TDM strategy and improvements at the Bedford Street/Hartwell Avenue intersection. 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. ***Economic Development Officer,*** *Planning Board, Massport, US Dept of Defense, Business Community, HATS;* ***IT***

4) Allow small-scale, service-oriented commercial uses in office parks to create synergy between employers and service-type uses to reduce auto trips. ***Planning Board****, Business Community:* ***IT***

5) Investigate feasibility of establishing mixed-use development at commercial nodes. ***Planning Board****, Business Community;* ***IT***

6) Encourage redevelopment in East Lexington along the Massachusetts Avenue commercial corridor that is transit and pedestrian friendly by supporting reduced setbacks and parking behind buildings. ***Economic Development Officer,*** *Planning Board;* ***IT***

7) Promote greater use intensity at the commercial node on Bedford Street north of Route 128. ***Planning Board and Business Community****;* ***IT***

8) Plan for the future of the StrideRite Site (191 Spring St); explore potential for a cohesive mixed use development with or without housing. ***Planning Board and Economic Development Officer****;* ***IT***

B. Update home occupation provisions in zoning, to reflect changing economic activity and reduce commuting (but with protective controls).

1) Initiate revision of home occupation permitted uses in Zoning Bylaw to reflect changing work patterns and technologies. ***Planning Board****;* ***IT***

C. Consider feasibility of adding limited housing uses at certain non-residential locations.

1) Initiate action to establish housing as an allowed use in upper stories in the Town Center and East Lexington. Establishing housing in the Town Center requires expansion of parking. The benefits of structured parking as a catalyst for residential use and for the Town Center in general should be considered. ***Planning Board and Lexington Center Committee,*** *Traffic Safety Advisory Committee;* ***IT***

Appendices

A. Article XII of Chapter 135 of the Code of the Town of Lexington

B. Transportation Demand Management Policy

C. Public Comment

Appendix A: Article 12

ARTICLE XII, Traffic [Added May 5, 1987]

§ 135-71. Objectives and applicability.

A. The provisions of this article are intended to achieve the following purposes:

(1) To permit vehicular traffic on Lexington streets to move in an efficient manner without excessive delay or congestion;

(2) To permit emergency vehicles to reach homes and businesses with a minimum of delay;

(3) To reduce motor vehicle and pedestrian accidents on the town's streets;

(4) To consider and allow for safe and convenient routes for pedestrians and bicyclists;

(5) To promote cleaner air and to reduce automotive exhaust emissions caused by vehicles standing and idling for an excessive time;

(6) To promote the efficient use of the town's arterial and collector streets so that use of local and neighborhood streets as shortcuts can be discouraged;

(7) To avoid excessive traffic demand on town streets that necessitates extraordinary town expenditures to maintain adequate and safe traffic flow;

(8) To maintain a balance between the traffic-generating capacity of dwellings and businesses in the town and the traffic-carrying capacity of streets and intersections;

(9) To encourage alternative methods of transporting people, through public transportation, car pools and van pools, bicycling and walking, rather than near exclusive reliance on single-occupant automobiles;

(10) To encourage the use of good traffic engineering principles and design standards consistent with a predominantly residential suburban town;

(11) To encourage the positive management of traffic flow consistent with the town's other stated objectives;

(12) To encourage private sector participation in dealing with the town's traffic problems;

(13) To expand the town's inventory of data about traffic conditions on town streets.

B. No building permit shall be granted for the erection of a new building or the enlargement or renovation of an existing building with the result that there are 10,000 square feet or more of gross floor area on the lot, including any existing floor area, but not including any floor area devoted to residential use or to off-street parking, or there are 50 or more dwelling units, or their equivalent, in a development, including any existing dwelling units, the number of parking spaces is increased by 25 or more and there are 50 or more parking spaces, including any existing parking spaces, on the lot, unless a special permit with site plan review has been granted and the SPGA has made a determination that the streets and intersections affected by the proposed development have, or will have as a result

of traffic improvements, adequate capacity, as set forth in § 135-73, to accommodate the increased traffic from the development. The requirement for a special permit with site plan review (SPS) does not apply to a religious or nonprofit educational use, as described in § 135-9E(1). [Amended 4-6-1988 ATM by Art. 38; 3-27-1991 ATM by Art. 30; 3-30-1998 ATM by Art. 38]

§ 135-72. Traffic study required.

A. A traffic study shall be submitted with each application for a building permit, special permit or special permit with site plan review to which § 135-71B is applicable, or where required by any other provision of this By-Law.

B. The traffic study shall be conducted by a traffic engineer who will certify that he/she qualifies for the position of member of the Institute of Transportation Engineers (ITE).

C. For the purposes of this analysis, the terms below shall have the meaning indicated. The morning and evening "peak period" shall usually be the two hours between 7:00 a.m. and 9:00 a.m. and between 4:00 p.m. and 6:00 p.m. respectively. The morning and evening "peak hour" shall be that consecutive sixty-minute segment within the peak period in which the highest traffic count occurs as determined by traffic counts of the peak period divided into fifteen-minute segments. For uses which have an exceptional hourly, daily or seasonal peak period, the SPGA may require that the analysis be conducted for that extraordinary peak period. A street or intersection "likely to be affected by the development" is one which has an average daily traffic (ADT) of 2,000 vehicles or more and either:

(1) Carries 10% or more of the estimated trips generated by the development; or

(2) In the case of an intersection only, traffic from the proposed development will add 5% or more to the approach volumes. [Amended 4-6-1988 ATM by Art. 38]

D. The traffic study shall include:

(1) An estimate of trip generation for the proposed development showing the projected inbound and outbound vehicular trips for the morning and evening peak periods and a typical one hour not in the peak period. Where there is existing development of the same type of use on the site, actual counts of trip generation shall be submitted. Trip generation rates may be based on:

(a) [Amended 5-8-1996 ATM by Art. 29] The "Trip Generation Manual, Fifth Edition" prepared by the Institute of Transportation Engineers; and, if applicable,

(b) Data about similar developments in Massachusetts; or

(c) Data from professional planning or transportation publications, provided the methodology and relevance of the data from Subsection D(1)(b) or (c) is documented.

(2) An estimate of the directional distribution of new trips by approach streets and an explanation of the basis of that estimate. Where there is existing development of the same type of use on the site, actual counts of trip directional distribution shall be submitted.

(3) An assignment of the new trips to be generated by the proposed development to the segments of the Town street network, which shall include state highways in

Lexington, which are likely to be affected by the proposed development (see Subsection C).

(4) Average daily traffic (ADT) on the streets likely to be affected by the development (see Subsection C), counted for a twenty-four-hour period.

(5) Intersection turning movement counts of the morning and evening peak periods at the intersections likely to be affected by the proposed development (see Subsection C). In special circumstances where the peak traffic impacts are likely to occur at times other than the usual morning and evening peak periods, the SPGA may require counts for those other peak periods.

(6) An inventory of roadway characteristics of the principal approach streets adjacent to the development site and of the streets in the intersections at which turning movement counts are taken showing the width of the right-of-way and of the traveled way, traffic control devices, obstructions to adequate sight distance, the location of driveways or access drives within 500 feet of the entrance to the site for uses that are substantial trip generators, and the presence or absence of sidewalks and their condition.

(7) In the case of a development in an abutting city or town which will have a traffic impact on a street or intersection in Lexington which is one that is likely to be affected by the proposed development for which the traffic study is being prepared, the traffic impact of the development in the abutting city or town shall be included in the traffic study provided:

(a) That traffic impact is equal to or greater than that set forth in the test in Subsection C;

(b) The development has been approved by official action of that abutting city or town but has not opened for use prior to the date that the traffic counts required by this section were taken; and

(c) Data on the traffic impact of that development, comparable to that required by this section, is available.

(8) An analysis of the effect on the capacity of those intersections in the Lexington street system likely to be affected by the development (see Subsection C) during peak periods of:

(a) The additional traffic generated by the development; and

(b) Additional traffic from other developments previously approved by the Town of Lexington for which a traffic study was required, or by an abutting city or town as provided in Subsection D(7) above, which have not yet been opened for use prior to the date that the traffic counts required by this section were taken. Analysis of the capacity of intersections shall be based on traffic levels of service as described in the "Highway Capacity Manual, 1985 Edition" published by the Transportation Research Board. This analysis may include an intersection of an access drive serving a development and a segment of the Lexington street system.

(9) Where mitigating measures or trip reduction programs are proposed, they shall be proposed by the applicant and shall accompany the traffic study at the time of filing of the application. Where the proposed mitigating measure is the construction of a traffic engineering improvement, evidence, such as letters of support, or commitment, or approval, or the award of a contract, may be

submitted to show that construction of the traffic improvement is likely to occur. [Amended 4-6-1988 ATM by Art. 38]

(10) An estimate of the time and amount of peak accumulation of off-street parking. The counts referred to above shall have been taken within the 12 months prior to the filing of the application. Upon request, the traffic engineer shall furnish an explanation of the methodology of the traffic study and additional data, as needed.

§ 135-73. Adequate traffic capacity.

A. Prior to granting a special permit or special permit with site plan review in those cases covered by § 135-71B or as may be required elsewhere in this By-Law, the SPGA shall determine that the streets and intersections likely to be affected by the proposed development currently have, or will have as a result of traffic improvements, adequate capacity, as defined in Subsection B. In making its determination of adequate capacity, the SPGA shall consider at least the cumulative effect on a street or intersection likely to be affected by the development, as provided in § 135-72C, of:

(1) Existing traffic conditions;

(2) Estimates of traffic from other proposed developments which have already been approved in part or in whole by the Town of Lexington for which a traffic study was required, or by official action of an abutting city or town, which have not yet been opened for use prior to the date that the traffic counts required by this article were taken; and

(3) Estimates of traffic from the proposed development.

B. Adequate capacity defined by level of service. Adequate capacity shall mean level of service "D" or better as described in the "Highway Capacity Manual, 1985 Edition" published by the Transportation Research Board. If the level of service that would result from the cumulative effect, referred to in Subsection A, is "E" or below, the SPGA shall determine there is not adequate capacity and shall deny the application.

C. Mitigating measures to improve capacity. [Amended 4-11-1988 ATM by Art. 38]

(1) The SPGA shall consider that various traffic engineering improvements, or other method of positive traffic control, such as a traffic control officer, can improve the traffic-carrying capacity of an intersection or street and improve the level of service rating to a higher and acceptable value. The SPGA shall consider such improvements, or other method of traffic control, in its determination and may make a conditional determination that adequate capacity is dependent upon the construction of the traffic engineering improvement, or other method of traffic control.

(2) The SPGA may make a condition of its approval of the special permit or special permit with site plan review that the start, or any stage, of the construction of the development, or the occupancy thereof, is dependent upon the start or completion of the traffic engineering improvement or of the start of another method of positive traffic control, such as a traffic control officer, on a permanent basis. A conditional approval shall be dependent upon at least a start of the physical construction of the traffic engineering improvement or the execution of an agreement with the Town of Lexington for another method of traffic control.

Letters of support, or commitment, or approval, or the award of a contract are not considered as a start of construction. However, as the basis for making a conditional determination of adequacy, the SPGA may consider as evidence that the traffic-carrying capacity will be improved to a higher level of service, such letters of support, or commitment, or approval, or the award of a contract for construction of the traffic engineering improvement, or a proposed agreement with the Town of Lexington for another method of traffic control.

D. Trip reduction requirements. [Amended 4-4-1990 ATM by Art. 36]

(1) As a condition of its approval of a special permit or a special permit with site plan review, the SPGA may require actions and programs by the owner and/or manager of a development to reduce the number of single-occupant automobile trips made to a development, particularly during peak traffic hours. Such actions and programs may include:

(a) Providing a pass to employees for use on a public transportation system that serves the development site;

(b) Use of car pools and van pools;

(c) Scheduling of hours of operation such as flex-time, staggered work hours, and spread scheduling that reduces trips during peak traffic hours;

(d) Preferential parking locations and arrangements for vehicles other than single-occupant automobiles;

(e) Restrictions on access to, or egress from, off-street parking areas during peak traffic hours; or

(f) Bicycle parking facilities and other measures such as locker and shower facilities to encourage bicycle commuting.

(2) Where such conditions are included, they shall include a reporting system which monitors the effectiveness of the trip reduction program. The SPGA may make a condition of the granting of the special permit or special permit with site plan review that:

(a) Such monitor be directly responsible to and report to the Building Commissioner or designee; and

(b) The applicant be responsible for the cost of providing such monitoring system.

(3) If the Building Commissioner or designee determines that the conditions of the special permit or special permit with site plan review are not being met, he/she shall order the applicant to bring the development into compliance or shall take such other corrective enforcement action as may be needed to ensure compliance.

Appendix B: TDM Policy

TRANSPORTATION DEMAND MANAGEMENT POLICY

Adopted by vote of the Planning Board, September 16, 1998
Originally adopted March 10, 1997

OBJECTIVES:

This Policy focuses on meeting the transportation needs of Lexington by a variety of measures that affect the **demand** for, and use of, various modes of travel rather than changes in the **supply** of transportation facilities, such as the construction of roadways and multi-level off-street parking facilities.

The Policy seeks to reduce the use of automobiles, particularly single occupant vehicles (SOV), in order to:

1. permit vehicular traffic on Lexington streets to move in an efficient manner without excessive delay or congestion,
2. reduce motor vehicle and pedestrian accidents on the town's streets,
3. permit emergency vehicles to reach homes and businesses with a minimum of delay,
4. reduce the awareness of and impact from vehicular traffic on a predominantly residential town,
5. promote safe and convenient routes for pedestrians and bicyclists,
6. promote cleaner air and reduce automotive exhaust emissions caused by vehicles standing and idling for an excessive time,
7. maintain a balance between the traffic generating capacity of businesses and residential development in the town and the traffic carrying capacity of streets and intersections.

The Policy also seeks to:

1. assure adequate opportunities for mobility for all Lexington residents, workers and visitors, and
2. expand the Town's inventory of data about transportation needs and transportation utilization.

The Policy seeks to aid Lexington businesses and other establishments to:

3. reduce the cost of operations for Lexington companies and establishments caused by delays in vehicular traffic,
4. expand the pool of potential employees who can reach places of work in Lexington more easily and economically,
5. employ a more efficient and satisfied work force less concerned at the work place by the frustrations of transportation, particularly commuting,

6. permit potential customers and clients to reach places of business in Lexington more easily and economically,
7. provide transportation services more effectively in collaboration with other businesses and with the Town.

TERMINOLOGY: DEFINITIONS OF TRANSPORTATION TERMS AND CONCEPTS

ALTERNATIVE TRANSPORTATION SERVICES: Alternatives to the use of the single occupant automobile including but not necessarily limited to public transit, ride-sharing, van pooling, and use of pedestrian or bike ways.

CONGESTED INTERSECTION: an intersection of two or more streets that meets the test set forth in paragraph 12.2.3. of the Zoning Bylaw for an intersection "likely to be affected by the proposed development" that now has, or is projected to have, a traffic level of service of "C" or below or has experienced that level in the past.

FIXED ROUTE TRANSPORTATION SYSTEMS: a transportation service that operates on a specific route according to a pre-determined schedule. (See subsection 3 on page 5 for a description of these services.) Other "demand responsive" services are flexible, respond to calls for service from customers and do not have a specific schedule.

TRAFFIC LEVEL OF SERVICE (LOS): a method of evaluating the degree of congestion of intersections as described in the "Highway Capacity Manual, 1985 Edition" published by the Transportation Research Board. The system has six levels from "A" to "F" with "A" being the least congested and "F" being near failure.

TRANSPORTATION HANDICAPPED: any of several classes of people who are not able to use private automobiles, or in some cases regular public transportation, due to age, economic condition or physical disability. The term typically applies to children who do not have a driver's license, older people no longer able to drive, those unable to afford a private automobile and those with various physical disabilities.

TRANSPORTATION MANAGEMENT ASSOCIATION: a non-profit group formed by local businesses, corporate employers, owners/developers of properties, and civic leaders to address community transportation problems that can be dealt with more efficiently on a collective basis. Some are single purpose organizations formed specifically to address transportation concerns to facilitate private sector involvement in addressing transportation issues. Others are elements of broader multi-purpose civic organizations.

TRANSPORTATION DEMAND MANAGEMENT (TDM): various services and programs to affect the behavior of motorists and encourage them to use alternatives to driving alone. Transportation Demand Management strategies focus on reduction of vehicle trips, especially commuter trips during peak travel periods.

TRANSPORTATION SYSTEMS MANAGEMENT (TSM): a program to improve the efficiency of the existing transportation system by more effective use of facilities or resources.

TOWN TRANSPORTATION COORDINATOR: The person appointed under the Lexington Selectmen/Town Manager Act to be the Transportation Coordinator.

APPLICABILITY

Inclusionary Transportation Services
In order to obtain a favorable recommendation, or where applicable, a favorable action, by the Planning Board on construction or other activity that will increase transportation demand, each:

a. commercial establishment with 10,000 square feet or more of gross floor area on the lot, (including any existing floor area, but not including any floor area devoted to residential use or to off-street parking), or
b. new housing development, with 25 or more dwelling units, which gains an increase in density greater than that previously allowed by right[1] in the zoning district in which it is located, or
c. other activity that might not include new construction, such as a change of use, that increases the number of vehicular trips by 50 or more trips per day,

shall provide transportation services as described in this Policy.

COMPENSATORY BENEFIT: Where an action of the Town increases the value of a property, by permitting more intensive commercial development or a higher density of residential development, or reduces an owner's or developer's expense, by granting a waiver or variance from normal standards, the Town should receive a benefit, such as some type of transportation demand management program in return. Further, the Town should refrain from actions which increase value, or reduce expenses, unless it does receive such a benefit.

Written Transportation Demand Management Plan Required
A developer or property owner:

a. constructing a more intensive commercial development or
b. constructing a higher density of residential development or
c. that proposes another activity that increases the number of vehicular trips by 50 or more trips per day,

shall be responsible for preparing and administering a written Transportation Demand Management Plan. [This responsibility may be delegated to a company or other tenant of a building.]

The developer may also propose alternative transportation infrastructure improvements and alternative transportation services in the event that the principal proposed facilities and services cannot be successfully achieved.

[1] This does not apply to residential developments in cluster subdivisions with fewer than 25 dwelling units that are permitted under Section 9 of the Zoning Bylaw. Another consideration is that some cluster subdivisions may have a higher density, as measured by the number of dwelling units, but not have a greater impact in vehicular trips than a conventional subdivision otherwise permitted by right.

It will usually be necessary to enter into a written agreement with the Town to insure that the provisions of the Transportation Demand Management Plan are carried out by the developer and subsequent occupants or owners.

NOTE: Later sections of this Policy contain additional provisions for annual reporting and monitoring of compliance with the written Transportation Demand Management Plan.

Once approved, the Transportation Demand Management Plan, shall apply to any successors or assigns, to any subsequent developer, property owner or business. The provisions of the Plan shall run with the property.

PROGRAM REQUIRED

The Transportation Demand Management Plan shall provide a program of transportation services, drawn from **each** of the nine categories below. The Plan shall generally include each of the numbered services in each of the nine categories except that the Planning Board may permit exceptions on a case by case basis. These new transportation services shall be a parallel program to any proposed intersection improvements to mitigate traffic congestion as required by subsection 12.3 of the Zoning Bylaw.

If a proposed development is near an intersection "likely to be affected by the proposed development" (as defined in ZBL 12.2.3.) that is a "congested" intersection, the Planning Board may require additional efforts in some of the nine categories - as listed below under "congested intersections". A "congested" intersection is one that now has, or is projected to have, a traffic level of service of "C" or below, or has experienced that level in the past.

1. Site Design

1.1 Include transportation infrastructure elements in the site design, such as:

a. Adequate street and driveway widths, turning radii, and vertical clearance (if applicable) to accommodate alternative transportation services vehicles.
b. Bus stops, turnarounds and/or pull-offs.
c. Bus stop shelters and benches. These may be provided in a building, such as part of a lobby area adjacent to a bus route/stop. Or they may be provided adjacent to the street in a comfortable, all weather passenger shelter. When not included in a building, a passenger shelter shall have lighting, landscaping, seating or other amenities for riders.
d. Drop-off and pick-up for alternative transportation services other than buses.
e. A number of off-street parking spaces that shall not exceed the minimum number of parking spaces required by Section 11.3 of the Zoning Bylaw unless the applicant can demonstrate that a greater number of parking spaces is required to serve the public interest.
f. Suitable signage.
g. Pedestrian routes that deal adequately with potential points of conflict with vehicular traffic.
h. Taxi stands (if applicable).

1.2 Provide preferential parking locations and arrangements closest to a building for vehicles other than single occupant automobiles. See ZBL 12.3.4 4)

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

1.3 Participate in a site development that provides more concentrated development that is served more easily by alternate transportation services. [*In some cases, this is likely to transcend property lines and require modification of traditional zoning and site development requirements.]*

2. Transportation Information

2.1 Designate a transportation coordinator for each property. The transportation coordinator for the property shall coordinate the provision of transportation services with each business with five or more employees on the property.

2.2 The transportation coordinator for the property shall:

a. Provide a data center where prospective users of alternative transportation services can locate others with whom they can ride.

b. Maintain and promote information about alternative transportation services. This includes both an office and informational bulletin boards or a kiosk. It includes assisting the promotional activities of others, such as LEXPRESS, MBTA or transportation management associations that serve the site.

3. Connection to Existing Public Fixed Route Transportation Systems

In the context of this Policy, *Public Fixed Route Transportation Systems* includes:

- the MBTA Red Line rail rapid transit service with a terminal at the Alewife station and all other parts of the MBTA rail rapid transit service that connect to it;
- the MBTA Green Line light rail transit service with a terminal at the Riverside station and all other parts of the MBTA rail rapid transit service that connect to it;
- the MBTA Commuter Rail service with nearby stations in Belmont, Waltham, Lincoln, Concord, Woburn and Winchester;
- MBTA buses that have part of their route in Lexington, or at the Alewife Red Line terminal or the Riverside Green Line terminal, or
- the Lexington LEXPRESS service.

Elsewhere in the Policy there are references to cities and towns served by *Existing Public Fixed Route Transportation Systems*. That includes:

- the metropolitan core, i.e., cities and towns with:
  - MBTA rail rapid transit service that have access to the Alewife Red Line terminal,
  - MBTA light rail transit service that have access to the Riverside terminal, and
  - any other parts of the MBTA rail rapid or light rail services that connect to the Alewife or Riverside terminals.
- communities, such as Arlington, Belmont, Concord, Lincoln, Waltham, Woburn or Winchester through which MBTA bus routes or commuter rail routes pass, and
- Lexington.

3.1 The transportation coordinator for the property shall maintain and promote information about public fixed route transportation services. Route and schedule information for all public fixed route transportation systems and any transit service, such as the Alewife Shuttle, (operated by the 128 Business Council) that connects to an MBTA or LEXPRESS service, shall be displayed.

3.2 The property owner or tenant shall financially assist (paying at least half the cost of a pass) for any employee requesting a pass for use on:

a. a fixed route public transportation system, as described above, or
b. any transit service, such as the Alewife Shuttle, (operated by the 128 Business Council) that connects to an MBTA or LEXPRESS service. See ZBL 12.3.4 1).

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

3.3 Pay the full cost of a pass for any employee requesting one for use on:

a. a fixed route public transportation system, as described above, or
b. any transit service, such as the Alewife Shuttle, (operated by the 128 Business Council) that connects to an MBTA or LEXPRESS service. See ZBL 12.3.4. 1).

3.4 Contribute financially annually and for an extended period to a transportation fund devoted to assuring the continued provision of transportation services by the Town. This includes both transportation coordination services and LEXPRESS.

3.5 Contribute financially annually and for an extended period to allow LEXPRESS service to serve the site or for the frequency of LEXPRESS service to be increased.

3.6 Make a capital investment in a public transportation service such as purchase of a LEXPRESS bus.

4. Outreach to Areas Not Serviced Well by Existing Public Transportation Systems

In the context of this Policy, *Areas Not Serviced Well by Existing Public Transportation Systems* means suburban towns and cities that are **not** serviced by *Existing Public Fixed Route Transportation Systems*, as described above. They are typically west, north and south of Lexington.

4.1 Encourage use of carpools, ridesharing and vanpools by a continuous program of education of employees, and visitors on the need for, and existence of, alternative transportation services and by marketing these transportation services to encourage greater use by them. The transportation services may be operated by others. See ZBL 12.3.4 1)

4.2 Provide preferential parking locations and arrangements closest to a building for vehicles other than single occupant automobiles See ZBL 12.3.4 4)

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

4.3 Actively participate in, including financial support of, an organization that operates car pools and vanpools.

4.4 Actively participate in promotional activities for alternative transportation services whether provided by transportation management associations or by the Town.

4.5 Provide, or contribute to the provision of, day care services on or near the site and encourage greater use of car pools, ride sharing and vanpools for those with child care or elder care responsibilities.

4.6 Provide, at the developer's or business' expense, vans or automobiles for use by own employees in vanpools or car pools.

4.7 Reduce the number of parking spaces to the minimum number required by the Zoning Bylaw or to fewer than those required by using the special permit provision for a reserved parking area.

5. Other Trip Reduction Techniques

5.1 Provide only a minimum number of parking spaces that meet minimum Town requirements rather than more spaces than are required.
Comment: The Planning Board needs to review the parking standards in the Zoning Bylaw to be sure that they are the minimum.

5.2 Utilize the special permit provision in the Zoning Bylaw (paragraph 11.8.a.) to construct fewer parking spaces than the minimum number otherwise required if a plan shows there is a "reserve area" where parking spaces could be built if needed.

5.3 Encourage employees to work at home and "telecommute" to the company by electronic means for some parts of the day, particularly during peak travel hours, or parts of the week.

5.4 Schedule hours of operation, such as flex-time, staggered work hours, and spread scheduling that reduces trips during peak traffic hours See ZBL 12.3.4 3) while still reducing the total number of single occupant vehicles (SOV).
Comment: Flex-time is an effective technique for reducing trips ***during peak hours****. It may not result in an absolute reduction of, but a shift in, SOV trips to another time period. The applicant shall consider, and address in the Transportation Demand Management Plan, the possibility that flex-time can be competitive to, and reduce utilization, of other alternative transportation services that depend on a group of riders necessary to make alternative transportation services feasible. A developer or property owner preparing a transportation demand management plan needs to address the potential conflict between flex-time and alternative transportation services in the Plan so that flex time still permits a reduction in the total number of single occupant vehicles (SOV).*

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

5.5 Provide, or contribute financially to an organization that provides, vans or a shuttle bus service to restaurants, banks or other mid-day employee needs that are not available within walking distance of the work site.

5.6 Adopt a formal Trip Reduction Plan with a specific target percentage of single occupant vehicles (SOV) accessing the site. The penalty could be a financial charge to the company - deposited into a fund for alternative services transportation operated by the Town or by a non-profit association.

5.7 Arrange for car rentals, operate delivery and passenger shuttles, consolidate courier or mail pick-up services to reduce the number of vehicle trips to and from the property.
5.8 Provide employee incentives, such as prizes, trips, time off etc., for using alternative transportation services.
5.9 Place restrictions on access to, or egress from, off-street parking areas during peak traffic hours. See ZBL 12.3.4 5)

6. Other Travel Modes

6.1 Provide bicycle parking facilities that are secure and protected from the weather, and other measures such as locker and shower facilities to encourage bicycle commuting. See ZBL 12.3.4 6)
6.2 Construct a sidewalk or a bicycle/pedestrian path on own property that connects to a larger network of sidewalks, or bicycle/pedestrian paths in the area. (Connections to a larger network that is planned but is not yet constructed in its entirety are included.)
6.3 Provide for the issuance of taxi vouchers, or other means to aid the mobility of "transportation handicapped" (see Terminology) site occupants or visitors who do not use private automobiles.

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

6.4 Construct, or make a financial contribution to, a sidewalk or a bicycle/pedestrian path **off their own site** that is part of a larger network of sidewalks, or bicycle/pedestrian paths in the area. (Contribution to a fund for maintenance or security in that network is included.)

7. Coordination With Other Transportation Demand Management Activities

7.1 Be a contributing, dues paying member of a Transportation Management Association or of a transit service, such as the Alewife Shuttle, (operated by the 128 Business Council) that connects to an MBTA or LEXPRESS service. See ZBL 12.3.4 1)

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

7.2 Take a leadership role in organizing a Transportation Management Association, or a transit service, such as the Alewife Shuttle, (operated by the 128 Business Council) that connects to an MBTA or LEXPRESS service. See ZBL 12.3.4 1)
7.3 Make a financial contribution to a private association or to the Town for establishing or maintaining activities that promote one or more transportation management association(s) in Lexington.

8. Related Development Actions

8.1 Include basic support services for employees and business operations on site so they do not have to drive elsewhere to obtain those services. These include food service establishments, automatic teller machines and other convenience goods and day care.

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

8.2 Include additional support services for employees and business operations on site so they or the employees of other nearby establishments do not have to drive elsewhere to obtain those services. These include restaurants and other food service establishments, banks, dry cleaners, convenience goods, day care, elder care and auto repair.

9. Transportation Reporting

The transportation coordinator for the property shall:

9.1 Prepare an Annual Transportation Report that shall be submitted to the Town's Transportation Coordinator with information on:

a. compliance with the Transportation Demand Management Plan,

b. the number of persons regularly employed on the site and the zip code of the home of each such employee on the site. [Name and home address of employee not included.]

9.2 If the property owner or business files a Rideshare report to the Department of Environmental Protection, provide a copy of that report with the material submitted to the Town's Transportation Coordinator.

In the case of a "congested intersection" (see Terminology), the Planning Board may also require the developer or applicant to:

9.3 The transportation coordinator for the property shall include in the Annual Transportation Report:

a. A survey of the mode of travel of each person regularly employed on the site showing those arriving at the site by:

- single occupant automobile
- carpool
- vanpool
- public transportation - MBTA or LEXPRESS
- private transit service, such as the Alewife shuttle

- bicycle
- walking

In the case of employees who work at home and/or "telecommute" to the property, the Report may include a tabulation of the time that those employees are off the property.

b. A survey of the time of arrival and departure of persons regularly employed on the site.

9.4 As needed, the property owner shall provide funds necessary for independent monitoring of compliance with any special features of the Transportation Demand Management Plan for the development.

OTHER POLICIES

The transportation management services and programs shall not be discriminatory. They shall be designed and operated to maximize convenience of use for the primary on-site users but the services and programs shall be available for use by all.

The transportation management services and programs shall be consistent with, and mutually supportive of, other transportation management services and programs in the Town. Any questions on inconsistency shall be resolved in consultation with the Town Transportation Coordinator.

Through the execution of appropriate written agreements, the transportation management services provided by the developer shall remain operational and in use for an indefinite period, and be subject to the annual review and approval of the Transportation Coordinator. The written agreements shall provide penalties, which may be financial, for failure to provide the transportation management services included in the Transportation Demand Management Plan.

The developer shall be responsible for the construction and maintenance of the on site and off site transportation infrastructure elements included in the Transportation Demand Management Plan. Off site facilities may be constructed and maintained by the Town or by others, with the costs thereof borne by the developer or its successor.

The Planning Board will not make a recommendation on a proposed development subject to the requirements for Inclusionary Transportation Services until it has provided an opportunity for the Town's Transportation Coordinator to make a recommendation to the Board. If either the Board or the Transportation Coordinator requests, the Transportation Advisory Committee or designated representative(s) shall be provided an opportunity for the Town's Transportation Coordinator to make a recommendation to the Board as well.

Appendix C: Public Comment

On June 4, 2003, the Lexington Planning Board held a Public Hearing on the Draft Transportation Element. Mr. John Davies, Mr. Karl Kastorf, Mr. Tom Harden, and Mr. Anthony Galaitsis were present, as were staff members Garber, McCall-Taylor, and Machek. There were 10 people in the audience, including 5 members of the Transportation Element Advisory Committee.

Mr. Galaitsis began by welcoming the audience and asking Mr. Garber to briefly summarize the Draft Transportation Element. After Mr. Garber did so, Mr. Galaitsis turned to members of the Board for their comments.

Mr. Davies began by stating the need to amend the plan in light of the June 2 vote on the override. It was decided that a narrative would be inserted at the beginning of the plan to note that funding for the LEXPRESS bus service and transportation coordinator position had been cut. He went on to note that the numeration of Map 2 did not match that of the accompanying text and that Alewife station should be labeled as a Red Line station.

Mr. Harden suggested that the transportation aspects of the possible DPW relocation from 201 Bedford Street should be discussed in the plan.

From the audience, Mr. Richard Canale asked how often the Element would be updated. Mr. Garber replied that it had not yet been decided, but that 5 years had been discussed in the Land Use Reform Act group. Also, various initiatives from the plan will be implemented over the next few years.

Mr. Stewart Kennedy commented that labeling the intersection of Hayden Avenue and Spring Street as “Hayden/Spring & Spring” is confusing. It was decided that that label would be changed. He also asked about the term ‘betterment district.” Mr. Garber defined the term as a means of abutting landowners to reimburse the town for a linear capital improvement. It was decided to add the term to the glossary.

Mr. Ed Ganshirt asked if termination of the LEXPRESS bus service would invalidate the TDM Bylaw. Ms. Machek answered that it would not, as developers would be able to contribute to privately-run Transportation Management Associations or make physical improvements.

Mr. William Levison asked about the term Overlay District. Mr. Garber defined the term for him and it was decided that the term would be added to the glossary.

Ms. Elaine Dratch stated that she feels that all references to LEXPRESS and the Transportation Coordinator should remain in the plan, as she believes the town should return to its past level of service in the future.

Mr. Michael Martignetti stated that he believes traffic constraints to be a major obstacle to commercial development in Lexington and inquired into the study of problem intersections that Mr. Garber had spoken of at Town Meeting. He also stated that he believes the current FAR limits are too restrictive. Some discussion of FAR followed. Mr. Garber responded that the intersection study was included in the plan and that implementation of the significant portions of the plan in regard to alternative transportation will make business expansion more feasible.

Ms. Dratch asked whether the plan included links to the recent Vision 2020 meeting. Mr. Garber responded that the chief connection to Vision 2020 is that the transportation goals and objectives are much part of this document. Mr. Harden added that the Vision 2020 Implementation Committee is also considering an update of the goals and objectives, and Mr. Garber indicated that links to Vision 2020 Implementation needed to be established for the comprehensive plan in general.

Mr. Canale added that he had asked about the updating schedule because of things like the Governor's Smart Growth initiatives.

Mr. Kastorf moved that the Transportation Element be adopted with changes discussed that evening. Mr. Harden seconded the motion. It was voted unanimously to adopt the Transportation Element.