INTERIM REPORT OF THE
BELMONT PAVEMENT MANAGEMENT COMMITTEE

February, 2007

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Objectives of the Committee

- To create a policy which:
  - Prioritizes how future pavement management resources will be expended
  - Maintains predictability and fairness in decision-making
  - Manages the tradeoffs among
    - taxpayer financial impact
    - time
    - functionality and maintenance suitability, and
    - aesthetics
  - Maintains consistency in the treatment of non-road surfaces within the Town right-of-way

- To devise a funding mechanism to bring our streets to an acceptable standard
  - within fifteen years for arterials and collectors, and
  - within twenty-five years for local roads

  and maintain them to this standard thereafter

- To assure an adequate and consistent source of funding so as to work off the existing sidewalk repair back-log within fifteen years; and

- To address procedures and enforcement related to the street opening permit process

Committee Membership

John Brady
Peter Castanino (ex-officio)
Glenn Clancy (ex-officio)
Tom DiPace
Karen Freidberg
Frank French
Fred Haggerty
Michelle Oishi
Mario Rathle
Ron Sacca
Lee Slap
Mike Speidel

The Committee's "Pavement Management 101" self-education was supplemented by a guided tour with Glenn and Peter and by personal site visits

Background and General Observations

Current status review

- Since the mid-1990s, the Community Development Department has utilized a pavement management software system in order to prioritize funding by condition of street
- This system utilizes a pavement condition index (PCI) concept, which grades street condition on a scale of 1 to 100. (Sample report in Addendum 1.)
- With respect to repair work needed, PCI rankings may be interpreted roughly as follows:
  - 93-100: Nothing required
    - example: Pine Street
  - 85-92: Crackseal only
    - example: Bow Road
  - 72-84: Crackseal and patch required
    - example: Lincoln Street
  - 60-71: Overlay only or mill & overlay
    - example: Hurley Road
  - 0-59: Road beyond repair – full depth reconstruction needed
    - examples: Poplar Street, Grant Avenue

Background and General Observations, continued

- Belmont has approximately seventy miles of public streets to maintain[1]. Currently,
  - 9.6 miles (14%) are in "do-nothing" condition
  - 6.5 miles (9%) need only routine maintenance (cracksealing or crackseal & patch)
  - 5.6 miles (8%) require mill & overlay treatment
  - 47.8 miles (69%) require full depth reconstruction
- Assuming that the Committee's recommendations regarding curbing and sidewalk treatment for future projects are adopted and then applied consistently, the total cost (2007 dollars) of the treatment and reconstruction required is approximately $63 million
  - Hard costs only – does not include soft costs such as design, surveying and police details
  - A more detailed cost breakout by type of street is shown in Addendum 2
- In addition, the Public Works Department has a backlog of nearly 800 sidewalk repair requests, with a minimum cost of $1.2 million

[1] Excluding Pleasant Street and Trapelo Road/Belmont Street, which are eligible to be reconstructed with Federal highway funding

Background and General Observations, continued

Current funding review

- On June 3, 2002, Belmont voters approved a $2.4 million operating override, of which $1 million was dedicated to pavement management. Since that time, the annual capital budget for roads has averaged approximately this $1 million funding level
- In addition, the Town generally appropriates another $300,000 per year in state "Chapter 90" funds
- On average, of the roughly $1.3 million available to the Community Development Department for pavement management projects annually, only $800,000 is available for hard costs. The remainder represents
    - seed money for design and survey for Federally-funded projects such as Pleasant Street and Trapelo Road ($250K)
    - design, survey and police details for Town-funded projects ($200K), and
    - pavement maintenance, primarily crack-sealing ($50K).
- In addition, the Public Works Department spends, on average, $115,000 per year (including labor, supplies and equipment) for pothole patching
- The annual Public Works budget for sidewalk repair has ranged from $6,459 to $182,043
    - In FY07, supplemented with $148,000 of one-time Chapter 90 funds

Background and General Observations, continued

Other observations

- The pavement management program is now separated from, but still coordinated with, the water main replacement program
- Since FY01, the Selectmen have directed the Community Development Department to direct available funding towards the Town's arterials and collectors
  - No established definition distinguishes arterial, collector and local roads
  - Using the Committee's proposed definition to follow, without increased funding it could take another twenty years or more to address the remaining arterials and collectors – without addressing local roads at all
- At this time, there is no formal policy governing sidewalk, parking, shoulder, curbing and/or driveway treatment within the right-of-way in conjunction with pavement management projects
- Recent policy incorporates "traffic calming" measures into pavement management projects, where warranted, under the guidance of the Traffic Advisory Committee
- With regard to establishing standards for street opening permits for independent public utilities, in the opinion of Town Counsel:
  - The Massachusetts Department of Telecommunications and Energy (DTE) has the sole authority to establish post-excavation road restoration standards for public utilities; the Town may not set different standards

Background and General Observations, continued

- Under the current DTE regulations, utilities are not required to restore a road surface to a higher standard than its existing condition
- The Town cannot:
  - make utilities guarantee their work or maintain it after one year
  - impose inspection fees, although a modest administrative fee is permissible

- Nevertheless, the Town can enforce the DTE regulations. As set forth in Addendum 4, these existing regulations do offer the Town significant leverage with public utilities

Recommended Policies: Road classification criteria

- Arterials, collectors and local roads are to be classified according to their average daily traffic counts (ADTs), as follows:
  - Arterial: > 10,000 ADT
    - example: Concord Avenue from Leonard Street to the Cambridge line
  - Major collector: 6000-10,000 ADT
    - example: Cross Street from Brighton Street to Channing Road
  - Minor collector 1: 4000-6000 ADT
    - example: School Street from Common Street to Washington Street
  - Minor collector 2: 1000-4000 ADT
    - example: Beech Street
  - Local: < 1000 ADT
- The estimated fifty road segments which fall under the arterial and collector categories are shown in Addendum 3. The remainder are local roads
- As soon as practicable, ADTs should be recorded where data is estimated. Classifications of individual roads may change based upon actual data

Recommended Policies: Treatment within the public right-of-way

- In all cases, the following standards are effective if the Town is performing a pavement management project involving overlay, mill & overlay, or full depth reconstruction, and will be implemented by the Community Development Department.
- Conversely, the standards will not be effective if the Town is merely patching or crackseal & patching, in which event the existing conditions will be left in place.
- Sidewalks not falling under the standards will continue to be repaired on as-needed basis by the Department of Public Works.

Sidewalks

A. If a sidewalk exists currently:
   - Retain a sidewalk in that location
   - Replace existing asphalt sidewalks with concrete
   - Replace or retain existing concrete sidewalk panels on a case-by-case basis, in the judgment of the Community Development Director

B. If a sidewalk does not exist currently:
   - The classification of the road is not relevant per se

Recommended Policies: Treatment within the public right-of-way, continued

- Place concrete sidewalks adjacent to walking demand generators on both sides of the street, and on both sides[2] of the primary pedestrian collector streets associated with them. For this purpose, a 'walking demand generator' is defined as a:
  - Primary school bus collection point
  - Public transit stop
  - Town office
  - House of worship
  - Commercial or retail establishment
  - School
  - Playground
- Place concrete sidewalks adjacent to other attractions accessible primarily by vehicular traffic, but only if adequate off-street parking does not exist

[2] Exact length to be determined by the Community Development Department

Recommended Policies: Treatment within the public right-of-way, continued

On-street Parking

A. If the pavement width[3] of the road is less than 23 feet: Parking permitted on one side only, with no designated parking lane
   - example: Pine Street at Belmont Street

B. If the pavement width is 23 feet or more:
   - No walking demand generator: Parking permitted on both sides, with no designated parking lane
     - example: Walnut Street
   - Arterial or major collector, adjacent to or leading to a walking demand generator:
     - If pavement width is less than 38 feet: Parking permitted on one side only, within a designated parking lane[4] [5]
       - example: White Street
     - If pavement width is 38 feet or more: Parking permitted on both sides, within designated parking lanes
       - example: Cross Street

[3] Regardless of the width of the right-of-way.
[4] For roads leading to a walking demand generator, the designated parking lane should be of sufficient length to accommodate six cars given restrictions. Same for minor collectors 1 or 2
[5] Whether to stripe a designated parking lane for specific parking stalls is at the discretion of the Community Development Director

Recommended Policies: Treatment within the public right-of-way, continued

- Minor collector 1 or 2, adjacent to or leading to a walking demand generator:
  - If pavement width is 34 feet or less: Parking permitted on one side only, without a designated parking lane
    - example: Beech Street
  - If pavement width exceeds 34 feet: Parking permitted on both sides, without designated parking lanes
- Local road, adjacent to or leading to a walking demand generator: Parking permitted on both sides, without designated parking lanes, pavement width permitting[6]
    - example: Hull Street

Shoulder Treatment If Sidewalk

A. No planting strip[7] if:
- Adjacent to a walking demand generator
- Adjacent to a designated parking lane serving a walking demand generator
- It is not physically possible to contain it within the right-of-way

B. Otherwise, a planting strip of three feet or more in width

[6] In the judgment of the Traffic Division of the Belmont Police Department
[7] Note that the removal of existing shade trees if necessary to implement these standards is regulated by existing Commonwealth of Massachusetts law

Recommended Policies: Treatment within the public right-of-way, continued

Curbing

A. On arterials and major collectors: Straight granite curbing on both sides where there is a sidewalk on at least one side of the street, and cape cod berm elsewhere
   - examples: straight granite: Brighton Street, cape cod: Winter Street

B. On minor collectors 1 and 2: Sloped granite curbing on both sides where there is a sidewalk on at least one side of the street, and cape cod berm elsewhere
   - example: sloped granite: Washington Street

C. On local roads:
   - Abutting a walking demand generator: Straight granite curbing on both sides of the street
     - examples: Palfrey Road at Common Street (Methodist Church), Grosvenor Road at Grove Street (Grove Street Playground)
   - Leading to a walking demand generator: Straight granite curbing on both sides of the street to the next adjacent residential driveway
     - example: Worcester Street at Belmont Street (Linda's Donuts)
   - Otherwise, on a slope of 4% or more, or connecting two slopes of 4% or more: Cape cod berm on the entire block
     - example: Winn Street from Pleasant Street to Claflin Street
   - All other cases: No curbing

Recommended Policies: Treatment within the public right-of-way, continued

D. Resident-installed curbing:

- If installed prior to pavement management project: Grandfather if the resident so requests
- After a pavement management project is completed: Not permitted

Treatment at driveways

A. Edge treatment

- If straight granite curbing, slope greater than or equal to 4%: Granite corner rounds
- If straight granite curbing, slope less than 4%: Transitional granite curbing
- If sloped granite curbing, cape cod berm or no curbing: No edge treatment

B. Apron treatment:

- If sidewalk: Concrete apron
- If no sidewalk: Asphalt apron

Recommended Policies: Treatment within the public right-of-way, continued

Traffic calming

- Include traffic calming measures in pavement management projects, where required, and continue their funding within the pavement management program
- Continue the existing process for determining need and design:
  - The Traffic Advisory Committee, assisted by the Belmont Police Department and the Community Development Department, recommends specific measures to the Board of Selectmen
  - Selectmen make the final determination on recommended measures

Recommended Policies: Coordination with utility work

Coordination with sewer improvements[8]

- Sewer projects which involve pavement excavation are to be completed prior to pavement management projects
- In cases where pavement conditions of potential projects are equal, preference is to be given to projects which can also solve existing drainage problems within the road right-of-way
- Funding:
  - If in connection with solving a local drainage condition: Within the pavement management program
    - example: Acorn Street
  - If in connection with addressing a system-wide need: Within the Sewer Department budget
    - example: Washington Street

[8] Includes the Town's inflow/infiltration (I/I) program

Recommended Policies: Coordination with utility work, continued

Coordination with other utility work[9]

- Utility projects which involve pavement excavation are to be completed prior to pavement management projects
  - Notes:
    - Utilities typically need a one-to-two year notice in order to coordinate their own plans and budgets
    - If pavement management policy is stabilized and funding is assured, the Community Development Department should be able to publish its pavement management project plan up to five years in advance
- The existing five-year moratorium on excavation after a pavement management restoration is affirmed, except in true emergencies
  - Notes:
    - Such a moratorium conforms to Massachusetts DTE regulations
    - In event of an emergency excavation, the Department of Public Works can dictate pavement repair method

[9] Includes the Town's storm sewer upgrade and water main replacement programs as well as the work of third-party utilities

Recommended Policies: Street opening permits and enforcement

- The Public Works Department already possesses most of the regulatory tools it needs within the existing Massachusetts DTE regulations. The Town should not attempt to create a separate set of pavement restoration standards, even for private contractors not subject to the DTE regulations
- Instead, more resources should be devoted to enforcement of those regulations
- Specifically:
  - Town Counsel will review and modernize Article 20.5 of the Town Bylaw, the "street opening permit" bylaw (Addendum 5), particularly so as to:
    - Incorporate the Massachusetts DTE standards by reference, making them applicable uniformly to private contractors and public utilities
    - Include "streets and other public ways" in the bylaw
    - Include "occupy" in the list of activities requiring a street opening permit
    - Require that all additions or changes to vehicular access from a public to a private way (including a driveway) necessitate a street opening permit, with prior Office of Community Development review and approval
  - The Selectmen or Public Works Department will deny permits as necessary, including to public utilities, in order to enforce compliance with the street opening permit bylaw

Recommended Policies: Street opening permits and enforcement, continued

- To the extent possible, the Public Works Department will make the street opening permit process a higher priority:
  - All permit recipients will be held to the letter of the DTE regulations to the degree practical
  - Any training required to accomplish a stepped-up level of enforcement will occur thoroughly and quickly
  - Street opening inspection and compliance duties will be rotated regularly among DPW supervisory staff
- Every morning, the DPW staff will monitor the prior evening's emergency Dig-Safe requests for unreported utility work, and inspect such work as soon as possible
- The Town will purchase a software application to help monitor street opening permits, and this application will be linked to the Town's existing pavement management and GIS software

Recommended Policies: Sidewalk maintenance

- Sidewalk maintenance will remain the responsibility of the Public Works Department
- However, the sidewalk maintenance funding will be removed from the Public Works operating budget and funded instead within the capital budget, pursuant to the funding recommendations in the section following

Recommended Policies: Priorities and funding

- At our existing funding level:
  - The focus of the pavement management funding will continue to be on mill & overlay and reclamation of the Town's arterial and collector streets
    - With effectively only $800,000 of annual hard cost capital, diverting a portion to local roads will make no practical difference, while serving to dilute the effectiveness of the arterial/collector effort
  - Sole exception: Add another $50,000 to the annual crackseal & patch budget
    - $100,000 total for crackseal & patch
    - $750,000 total for mill & overlay/reclamation (hard cost only)
  - The DPW's current $115,000 annual expenditure on pothole repair appears to be adequate, and may be reduced with a more aggressive pavement management program

- At a proposed enhanced funding level:
  - Bring all Belmont streets to a minimum PCI of 65, within fifteen years for the arterials and collectors and within twenty-five years for local roads
    - A 65 PCI provides a five-point PCI cushion against the need for full-depth reconstruction
    - Alternatives considered:
      - A more aggressive pace than fifteen/twenty-five years is probably beyond the current human resource capacity of the Community Development Department

Recommended Policies: Priorities and funding, continued

- A less aggressive pace would probably allow the streets which have already been addressed to deteriorate to the point where they too will need full-depth reconstruction before the proposed program is completed
  - The lifespan[10] of a newly-reconstructed arterial or collector is approximately twenty years, and that of a local road is approximately thirty years
- Work off the sidewalk maintenance backlog within fifteen years

- Specific proposal to achieve this objective:
  - Create a special-purpose stabilization fund limited to the pavement management and sidewalk maintenance programs, pursuant to Sections 14 and 50 of Chapter 46 of the Massachusetts Acts of 2003
  - Add $2.1 million to the pavement management program through a future Proposition 2½ operating override
    - In the initial year, this represents an additional $304 in property tax for the owner of Belmont's $803,600 median-value single-family home
    - At a 2.5% rate of increase, the median compounds to less than $600 per year in twenty-five years (future dollars)

[10] I.e., the length of time after which, with normal maintenance, the road may need mill & overlay treatment, but not full-depth reconstruction

Recommended Policies: Priorities and funding, continued

- Into the stabilization fund, place:
  - All unexpended capital budget and Chapter 90 funds previously appropriated for pavement management and sidewalk maintenance
  - $2.5 million from the Town's $5 million FY07 free cash surplus
  - The $1 million approved in the June 3, 2002 override, plus an additional 2.5% per year
  - The $2.1 million proceeds from the proposed override, plus an additional 2.5% per year
  - All interest earned on these amounts
- Limit withdrawals from the stabilization fund to the legally-specified purposes
- After the minimum 65-PCI objective has been achieved and the sidewalk maintenance backlog has been addressed, the stabilization fund might not be needed and the override amounts might be reduced
  - Note that the curbing and sidewalk portions of the pavement management program will then be fully in place, and, if the twenty-five-year plan has been completed diligently and effectively, the need for full-depth reconstruction during the next round of the program will have been eliminated
  - However, sustained investment in our pavement and sidewalk infrastructure will always be required

Recommended Policies: Priorities and funding, continued

- The recommended expenditure increases to which the additional funding will be devoted are summarized in the following table
  - All cost figures shown are in 2007 dollars. It is assumed that the 2.5% compound increase in the $1 million and $2.1 million override proceeds will offset inflationary increases in the program. If not, the practical effect will be to lengthen the amount of time it will take to achieve the stated objectives
  - The figures include an allowance for traffic calming

Summary of Recommended Funding Scenarios

	Current funding allocation	Recommendation with current funding	Recommendation with future $2.1M override	Comments
Sources:				
Chapter 90 funds	$300,000	$300,000	$300,000	
Approved within 6/3/02 override	$1,000,000	$1,000,000	$1,000,000	
Proposed future override			$2,100,000	A
Average annual expenditure	**$1,300,000**	**$1,300,000**	**$3,400,000**	
Uses:				
Seed money for Federal projects	$250,000	$250,000	$250,000	B
Design, survey, details (15%)	$200,000	$200,000	$375,000	
Cracksealing and patching – all	$50,000	$100,000	$100,000	C
Sidewalk maintenance	$0	$0	$100,000	B,D
Reconstruct or mill & overlay arterials & collectors	$800,000	$750,000	$1,050,000	E
Reconstruct or mill & overlay local streets	$0	$0	$1,525,000	F
Average annual expenditure	**$1,300,000**	**$1,300,000**	**$3,400,000**	

Comments

A – In initial year, represents an additional $304 in property tax on $803,600 FY07 median single-family home price. Would increase by 2.5% annually (compounded)

Comments, continued

B – To the extent that the need for funding this line at this level diminishes in the future, the unneeded portion is available to help absorb future cost increases in excess of the 2.5% overall annual increase in the program, or to fund needs unanticipated at this time

C – Required for roads with PCI ratings of 72-92

D – Required for at least the next fifteen years

E – 0-71 PCI. $15.7M over 15 years. After year 15, assume annual $1,050,000 is devoted instead to local streets through year 25

F – 0-71 PCI. $48.6M over 25 years, including extra $1,050,000 in annual funding in years 16-25

Addendum 1

Sample pavement condition index (PCI) report

Pavement Engineering Services
PAVEMENT CONDITION INVESTIGATION AND RECOMMENDATIONS
Belmont, MA

LOCATION: Common Street STREET ID: COMMO1
FROM: Warwick Road TO: Payson Road

RECOMMENDATIONS: Due to the severe cracking and moderate distortions, combined with its structural inadequacy, this pavement is recommended for RESURFACING. **Alternative #1**, for a 15 year service life, plan to mill the existing pavement to a 3" depth, repair localized base problems, fiber-seal major cracks and tack coat prior to placing 1.75" of Dense Binder and 1.75" of Modified Top Course. **Alternative #2**, for an 8 year service life, plan to mill the existing pavement to a 2" depth, make localized base repairs, seal major cracks, tack coat and place 2" of Modified Top Course.

NOTE: The information furnished by VHB is based on selected representative sample areas and were relied upon to make engineering judgments, assumptions, deductions and to form conclusions for this report. No assurance is given that they have remained unchanged since the field data were obtained, nor are the samples necessarily typical of other locations.

EXISTING CONDITIONS

FUNCTIONAL CLASSIFICATION: Arterial ZONE: Residential
RIDING COMFORT: Poor DISTRICT:
DRAINAGE CONDITION INDEX: Good STRUCTURE: HMA on Gravel Borrow
RATER: JSG DATE: 6/30/2005 AVERAGE DAILY TRAFFIC (ADT) 10,000
CURB: 5" Reveal TYPE: Granite Estimated TRUCK TRAFFIC: 3%
LENGTH: 664 ft. WIDTH: 34 ft. SECTION ID: 04876

DISTRESS LEVEL INVESTIGATION

DISTRESS IDENTIFICATION	*SEVERITY* *LOW*	*MODERATE*	*HIGH*
Potholes & Non-Utility Patches		☒	
Alligator Cracking		☒	
Distortion/Depressions		☒	
Rutting (Wheelpath)			
Weathering/Oxidation/Block Cracking		☒	
Transverse/Longitudinal Cracking		☒	
Bleeding/Polished Aggregate			
Surface Wear & Raveling		☒	
Corrugations, Shoving & Slippage			

PAVEMENT CONDITION INDEX
PCI
69

REMARKS:

The distress evaluation indicates there is moderate pothole patching, distortions, alligator, weather/block and transverse/longitudinal cracking. Extensive light raveling was also noted. The data indicates that the base index is 65 and the surface index is 77. An index of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100. The PCI has dropped 16 points in the last four years.

The test pit (TP) data revealed there is 6" of HMA on 14" of gravel borrow base with a silty sand subbase/subgrade.

The silty sand subgrade material is a fair to poor foundation when not subject to frost action, having a moderate to high frost potential and exhibiting poor drainage characteristics.

Based on the materials evaluation and traffic, this pavement section was found to be structurally inadequate, requiring a 1.5" overlay to meet the minimum AASHTO Elastic Layer design, which was not recommended.

Addendum 2

Detailed hard cost estimate by street classification and reclamation/reconstruction work required

Projected Cost to Repair Roads - All Classifications
Office of Community Development
January 2007

Classification	PCI	Treatment	Segments	Length (mi)	Area (sf)	Area (sy)	Treatment	Sidewalks	Curbing	Total	Class. Total
Arterial	0 - 59	Reclaim	12	3.27	558,549.00	62,061.00	$3,289,233	$1,365,342	$620,610	$5,275,185	
	60 - 71	Mill & Overlay	4	1.43	243,902.00	27,100.22	$813,007	$596,205	$271,002	$1,680,214	**$6,955,399**
	72 - 92	Maintenance	7	2.93							
	93 - 100	Do Nothing	5	1.39							
Major Collector	0 - 59	Reclaim	5	2.05	313,632.00	34,848.00	$1,846,944	$766,656	$348,480	$2,962,080	
	60 - 71	Mill & Overlay	1	0.36	55,296.00	6,144.00	$184,320	$135,168	$61,440	$380,928	**$3,343,008**
	72 - 92	Maintenance	2	0.51							
	93 - 100	Do Nothing	5	1.64							
Minor Collector 1	0 - 59	Reclaim	6	2.26	308,967.00	34,329.67	$1,819,472	$755,253	$308,967	$2,883,692	
	60 - 71	Mill & Overlay	0	0.00	0.00	0.00	$0	$0	$0	$0	**$2,883,692**
	72 - 92	Maintenance	2	0.37							
	93 - 100	Do Nothing	4	1.57							
Minor Collector 2	0 - 59	Reclaim	5	1.63	223,807.00	24,867.44	$1,317,975	$547,084	$223,807	$2,088,865	
	60 - 71	Mill & Overlay	0	0.00	0.00	0.00	$0	$0	$0	$0	**$2,088,865**
	72 - 92	Maintenance	2	0.45							
	93 - 100	Do Nothing	4	1.17							
Local*	0 - 59	Reclaim	265	38.62	5,149,928.00	572,214.22	$30,327,354	$12,588,713	$1,430,536	$44,346,602	
	60 - 71	Mill & Overlay	31	3.85	513,639.00	57,071.00	$1,712,130	$1,255,562	$142,678	$3,110,370	**$47,456,972**
	72 - 92	Maintenance	16	2.26							
	93 - 100	Do Nothing	31	3.87							
			407	69.63							
										Total =	**$62,727,936**

Assumes curbing on 25% of Local Roads and Includes an allowance for traffic calming measures

Addendum 3

Arterial and collector road segments by functional classification

Town of Belmont
Functional Classifications of Arterial and Collector Streets

Street	From	To	Year	ADT	Class
Belmont Street	Waltham Line	Trapelo Road	1992	12149	Arterial
Brighton Street	Cross Street	Cambridge Line	1986	15154	Arterial
Channing Road	Concord Avenue	Cross Street	1988	11343	Arterial
Clifton Street	Prospect Street	Pleasant Street	1982	13000	Arterial
Concord Avenue	Leonard Street	Cambridge Line	1998	19829	Arterial
Concord Avenue	Winter Street	Mill Street	2003	13086	Arterial
Concord Avenue	Pleasant Street	Leonard Street	1992	10316	Arterial
Cross Street	Brighton Street	Arlington Line	1986	12634	Arterial
Grove Street	Washington Street	Belmont Street	1992	18137	Arterial
Lake Street	Route 2	Arlington Line	1992	26401	Arterial
Leonard Street	Pleasant Street	Concord Avenue	1992	15381	Arterial
Lexington Street	Trapelo Road	Belmont Street	1998	10743	Arterial
Mill Street	McLean	Trapelo Road	1998	15829	Arterial
Mill Street	Concord Avenue	McLean Hospital	1998	14314	Arterial
Park Avenue	Route 2	Prospect Street	1992	10180	Arterial
Prospect Street	Park Avenue	Clifton Street	2003	10000	Arterial
Winter Street	Route 2	Concord Avenue	1998	11757	Arterial
Bright Road	Concord Avenue	Washington Street	2005	7243	Major Collector
Brighton Street	Pleasant Street	Cross Street	2000	9957	Major Collector
Common Street	Concord Avenue	Belmont Street	1992	8775	Major Collector
Concord Avenue	Lexington Line	Winter Street	1998	8086	Major Collector
Concord Avenue	Mill Street	Pleasant Street	1998	6600	Major Collector
Cross Street	Brighton Street	Channing Road	2000	7414	Major Collector
School Street	Washington Street	Belmont Street	2003	6181	Major Collector
Waverley Street	Trapelo Road	Thomas Street	2000	6211	Major Collector
Fairview Avenue	School Street	Grove Street		4000	Minor Collector 1
Goden Street	Concord Avenue	School Street		4000	Minor Collector 1
Marsh Street	Winter Street	Park Avenue		4000	Minor Collector 1
Prospect Street	Pleasant Street	Clifton Street		4000	Minor Collector 1
Royal Road	Common Street	Clark Street		4000	Minor Collector 1
School Street	Common Street	Washington Street	2003	4411	Minor Collector 1
Thomas Street	Clark Street	Waverley Street		4000	Minor Collector 1
Washington Street	School Street	Grove Street	2003	4994	Minor Collector 1
White Street	Trapelo Road	Belmont Street	2000	4975	Minor Collector 1
Baker Street	Concord Avenue	Hittenger Street	1992	1102	Minor Collector 2
Beech Street	Trapelo Road	Waverley Street	2003	3620	Minor Collector 2
Beech Street	Trapelo Road	Lexington Street		1000	Minor Collector 2
Goden Street	School Street	Washington Street		1000	Minor Collector 2
Hittenger Street	Underwood Street	Brighton Street		1000	Minor Collector 2
Maple Street	Trapelo Road	Bartlett Avenue		1000	Minor Collector 2
Oakley Road	Belmont Street	Cushing Avenue	2003	1185	Minor Collector 2
Oakley Road	Washington Street	Cushing Avenue		1000	Minor Collector 2
Slade Street	Trapelo Road	Common Street		1000	Minor Collector 2
Sycamore Street	Lexington Street	Trapelo Road	1992	3026	Minor Collector 2
Underwood Street	Concord Avenue	Hittenger Street		1000	Minor Collector 2
Washington Street	Common Street	School Street	2003	2490	Minor Collector 2
Waverley Street	Thomas Street	Common Street		1000	Minor Collector 2

Note: Estimated ADTs in some cases. Classifications may change based upon actual counts.

Addendum 4

Selected provisions in the Massachusetts DTE regulations

Selected Provisions in the Massachusetts DTE Regulations Governing Utility Excavation Work in Public Ways

- Municipalities have the authority to require street opening permits
- The permit may be modified or revoked with just cause at the municipality's discretion without rendering the municipality liable
- Utilities must notify municipalities at least two days prior to the start of work, and within fourteen days of its completion
- If directed by the municipality, photographs must be taken prior to the commencement of work
- Utilities must respond to all municipal trench restoration requests within 48 hours. Non-response gives the municipality the option of performing the work itself, with all expenses paid by the utility. Failure to respond may also result in the denial of future permit requests
- All patching work must be in compliance with Mass Highway standards, including:
    - The trench must be filled to the bottom of the existing pavement, and must not deviate more than 0.25" from the pavement surface
    - Approved backfill material (as defined) must be used
    - Soil excavated from a trench must be evaluated by trained personnel for suitability as backfill before being replaced in the trench
    - Trained personnel must also conduct a "soil ball" test of moisture content in the backfill material
    - Material must be compacted in 6" lifts, by making a minimum of four passes per lift. The permanent patch must be compacted (compressed) to within 95% of maximum dry density
    - Compaction verification of each lift must be performed using a Dynamic Cone Penetrometer (DCP), or equivalent approved by the municipality
    - The restoration of trenches up to five feet by seven feet in area must be performed by the infrared method, unless another method is agreed to by the municipality
- Regarding temporary and permanent patches:
    - A utility is responsible for any patch settlement and/or water ponding resulting from its work
    - All non-emergency excavations require a same-day permanent patch unless exempted in the street opening permit
    - Between December 1 and March 30, temporary patches must be removed and replaced with a permanent patch within five working days. Between April 1 and November 30, it is within two working days
- No less than 30 or more than 60 days after completion of a permanent patch, the utility must inspect the excavation for settlement, cracking or other defects, and fix same. Fixes must be re-inspected no less than 30 or more than 60 days from completion of the subsequent repair. Inspections must be documented and made available to the municipality upon request

Selected Provisions in the Massachusetts DTE Regulations Governing Utility Excavation Work in Public Ways

- On roads repaved within five years, the municipality has jurisdiction to determine the pavement repair method
- A disturbed sidewalk must be restored, full-width, to one foot beyond the disturbed area (asphalt) or to the next joint line (concrete)
- In the event that a Utility fails to comply with DTU standards, it must correct any failures at its own expense

Addendum 5

Article 20.5 of the Town Bylaws

Article 20 Public Safety and Property

ARTICLE 20

Public Safety and Property

20.1 No person, other than an authorized town agent shall place or throw or cause to be placed or thrown on to any public sidewalk, street, fire hydrant, or highway or upon any of the common lands of the Town any snow, dirt, gravel or foreign substance, including excrement, noxious or slippery liquids or material or suffer the same to remain thereon after being notified by a police officer to remove the same.

Section 20.1 amended at April 26, 1999, Annual Town Meeting. Approved by Attorney General Tom Reilly on October 18, 1999.

20.2 Other than for official town or conservation purposes, no person shall place or cause to be placed on any public sidewalk, street or highway, or upon any of the common lands of the Town, any refuse containers to be collected for disposal of refuse by the Town or any other collector of refuse and suffer the same to remain thereon for more than twenty-four (24) hours prior to the time said containers are scheduled to be collected for disposal of refuse or for a period of time terminating at 8:00 a.m. on the day following the said collection. In connection with a project for construction, demolition or repair of any building or any other construction for which disposal of refuse cannot be affected in accordance with the preceding sentence, the owner of the property upon which such construction, demolition or repair is undertaken may apply to the Board of Selectmen or its designee for a written permit which the board or its designee may in its discretion issue subject to such terms and conditions, including a bond, as may be deemed necessary and appropriate to protect the public safety.

Section 20.2 amended at April 23, 1984, Annual Town Meeting. Approved by Attorney General Francis X. Bellotti on July 30, 1985.

20.3 No person shall erect, set up or maintain any fence, portico, platform or door step extending into or on any public sidewalk or way.

20.4 No person shall permit a tree, branch thereof, hedge, bush or shrubbery growing on his/her land to extend over or overhang any street, sidewalk or highway so as to interfere with the free and full use of such street, sidewalk or highway. In addition to other penalties applicable to violation of these By-Laws, in the event the Town undertakes to remove any such obstructions, the Town may charge the landowner for the reasonable cost thereof.

Section 20.4 amended at April 27, 1987, Annual Town Meeting. Approved by Attorney General James M. Shannon on August 17, 1987.

20.5 No person, other than an authorized agent of the Town, shall break, dig up or construct any sidewalk; walk upon or otherwise alter lots or borders on cemetery grounds or areas of other municipal grounds upon which hedges, shrubs or flowers are grown; in any way damage or write, paint, print, inscribe, display signs or distribute written matter upon any town property; or conduct any parade upon public ways except upon written permit or authorization from the Board of Selectmen or its designee. Any such written permit or authorization shall be in force for such time and subject to such conditions, including a bond, as the Board or its designee may specify and shall set forth any appropriate safety or security measures to be taken, the manner in which the permitted activity is to be performed or the condition of the affected municipal property upon completion of the authorized activity.

20.6 No person shall throw stones, snow balls, sticks or other missiles, or kick football or play at any game in which a ball is used, or fly kites or other objects, or shoot with or use an airgun, bow and arrow, sling shot, or other similar device in or across any public ways of the Town, except that the Board of Selectman may authorize the use of a public way for recreational purposes in the same manner as is provided for an activity pursuant to Section 20.5 of this Article.

20.7 No person, except in the performance of some legal duty or in the lawful defense of a person or property, shall discharge any firearm within the Town.

20.8 No person shall drink, or have in his or her possession an opened container of any alcoholic beverage as defined in Chapter 138, Section 1, of the General Laws while upon any public way or upon any way to which the public has a right of access as invitees or licensees, or any park or playground or private land or place without consent of the owner or person in control thereof.