December 18, 2008

To: Board of Selectmen
Cc: Tim Higgins, Robert Domnitz, Chris Bibbo, Ruth Wales, Tom Gumbart, Kevin Mooney, Arthur Cotoni
From: Ad Hoc Traffic and Roadside Committee

Revised with Addendum 1-23-09

Re: 2009/2010 ROADWAY REHABILITATION PROJECT

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Executive Summary: The Ad Hoc Traffic and Roadside Committee (AHTRC) presents here a series of recommendations for the 2009/2010 Road Rehabilitation Project. Notable for review are the following proposed changes to the current roadway layout:

1) Roadside treatments and improvements to the crosswalk near the intersection of Bedford Road and Route 2;
2) Addition of a speed hump west of Lovelane Farm on Baker Bridge Road;
3) Addition of a speed hump east of the DeCordova on Sandy Pond Road;
4) Addition of sloped granite curbing in the Historic District along Trapelo Road;
5) Addition of a crosswalk at the intersection of Lexington and Trapelo Roads;
6) Modification to square the geometry of the intersection of Trapelo and Old Lexington Roads;
7) Roadside treatments at the intersection of Trapelo and Old County Roads; and
8) Flush, narrow granite cobble median on Trapelo Road as it approaches Old County Road.

Project Chronology

In keeping with its May 29, 2008 charge from the Selectmen, the AHTRC has participated in a design process focused on an integrated approach to roadway design involving diverse stakeholder groups attendant to this process. On October 3, 2008, the AHTRC submitted to the BOS for review a slate of design alternatives and considerations for the 2009/2010 roadway rehabilitation project. Today, we present for advance circulation specific recommendations to be formally presented to the BOS on January 12, 2009 with anticipation that design documents will be posted for bid no later than February 16, 2009.

The plan to repave many of the primary roads in Lincoln raises the prospect of increased traffic volumes and speeds. The absence of potholes as a *de facto* traffic calming measure could encourage increased speeds with the associated safety concerns and neighborhood impacts.

The introduction of traffic calming elements into the newly paved roads presents choices that may have impacts on diverse aspects of Town welfare, ranging from the convenience of residents to the aesthetics of rural character, to the response time of public safety vehicles. As the committee has discussed these issues, they felt the challenge of making well-considered decisions on traffic calming could be approached through a series of steps as follows:

1. Measure present traffic volumes and speed on existing roads at key locations;
2. Complete the paving project with several measures aimed at traffic calming described in this document.
    a. Travel lanes visually narrowed by painting fog lines closer to the road center
    b. Increased enforcement by public safety
    c. Limited introduction of speed humps
3. Following the completion of repaving, repeat the measurements of traffic volumes and speeds to assess impacts.
4. If speeds and/or volumes are significantly increased, engage in the test of added traffic calming elements in the form of portable speed tables. If proven to be effective and limited in terms of negative impacts on public safety response, proceed to add permanent speed humps.

Within this scheme, at this point in time, Lincoln is on Step 2 for the roads subject to rehabilitation in 2009/2010.

In the future, a standing committee may be able to better oversee this type of review with the benefit of a long-term time horizon and the development of standardized traffic management practices of familiar routine for Town participants.

Recommendations

1) Divide the road rehabilitation project into two, roughly equal parts. The AHTRC proposes that costs and road segments should be grouped as detailed in Table 1, below. The reasoning for this proposal reflects a combination of factors.

First, among the segments reviewed here, safety was considered as a factor for prioritization. However, upon review of average motorist speed, reports of accident hotspots, and testimony from Public Safety and residents, the AHTRC did not see a compelling argument to expedite the repair of one segment over another on this basis. All of these roads present safety concerns.

Second, fiscal prudence guided our review. We have aimed to minimize costs, including maintenance, in the long-term 20-year time frame. The road segments proposed here for 2009 construction were selected based on prioritization of the roads most acutely in need of repair as characterized by DPW Chief Bibbo and CEI and those roads for which, in their judgment, Lincoln would enjoy the most return on investment.

Third, under the Warrant Article 21 of the Town Meeting held March 29, 2008, $5,500,000 was approved to rehabilitate Routes 126 and 117 as well as Baker Bridge, east Sandy Pond, Bedford, Lincoln, and Trapelo Roads. However, on September 17, 2008, design consultant CEI estimated a $6,800,000 cost for those roads without any provision for traffic calming or new roadside improvements. By breaking up the current project into two phases addressed over two years, we can begin construction on a substantial portion next year as planned and go to Town meeting for approval on additional funding in time for the 2010 portion without delaying the overall calendar as originally contemplated. In fact, in light of current economic volatility, we speculate that there is a fair chance that over the course of 2009 construction costs for 2010 road rehab could actually fall from today's current projection.

Fourth, over the course of our review, it became apparent that certain locations would require significant study. The AHTRC believes that these locations merit further review from other Lincoln stakeholders, including the Long Range Planning Committee. The segments proposed for 2009 construction were also

identified as those portions for which public consensus on design would be most readily developed. Therefore, the AHTRC sees an additional benefit of this segmentation is that it permits more time for public deliberation on the challenging design of Rt. 117, as well as for the design of Lincoln Road, a segment with high visibility and use by Lincoln residents.

Fifth, the AHTRC recommends that no road segment be rehabilitated unless the work is done in keeping with a comprehensive consideration of the entire roadway segment. For example, residents have voiced concern that laying smooth new pavement will invite increases in traffic speed and volume. To counteract this scenario, the AHTRC recommends linking certain traffic calming measures with paving. In addition, the benefit of multiple traffic calming cues in combination can be greater than the sum of their parts because of the mutual reinforcement presented to motorists.

As noted earlier the $6.8M CEI estimate assessed the baseline cost of the foundational roadway repairs only, which included roadbed, pavement, drainage, and essential shoulder restoration; it assumed essentially no roadway alterations from the current layout and offered no provision for additional roadside paths. The increase over DPW's earlier $5.5M estimate was due to increased oil and steel prices, significant drainage issues, and partly to a surprising degree of heterogeneity in roadbed character as revealed by test samples taken over the summer of 2008.

Table 1. Proposed Segmentation for 2009-2010 Road Rehabilitation Project

Year of Construction	Road Segments
2009	Rt. 126 Bedford Rd., Rt.2 to Rt. 2A Baker Bridge Rd. Sandy Pond Rd., Baker Bridge to Bedford Rd. Trapelo Rd.
2010	Rt. 117 Lincoln Rd, north of Rt. 117 Bedford Rd., '5 Corners' to Rt. 2

2) Suggestions for a Future Standing Traffic and Roadway Management Committee

The charge and scope of a standing committee should be considered by the BOS over the coming months. In conjunction with Public Safety, DPW, and other Town agencies, this new committee could address

elements of work currently beyond the scope of the AHTRC, including development, use, and oversight of data collection and the development of traffic models, driver education, and enforcement. Such a committee would serve as guide for management of road rehabilitation and traffic management activities beyond March 2009. This committee may also review and update the speed zones in Town with the goal of establishing more speed zone consistency throughout Town, an outcome sought by many residents and recommended as an aid to law enforcement by Public Safety officials. Tasks to be considered for such a committee may include:

Enforcement

a) Monitoring police activity

b) Review of speed zones

c) Support of police officials to identify resources needed to meet traffic management goals

Education

a) Promoting awareness of and adherence to traffic laws

b) Initiative to promote community-wide awareness of transportation issues

c) Promotion of alternatives to automobile transportation (*e.g.*, riding the school busses)

Data Collection and Analysis

a) Oversight and calendaring of traffic counts

b) Engagement of traffic engineers for regular (~every 5-10 years) traffic assessments

Traffic Management and Mitigation of Traffic-Related Liabilities

a) Participation in regional traffic planning effort

b) Advocacy for infrastructure improvements on state highways

On-Going Guidance

a) Review of signage and roadway visual clutter

b) Facilitation of public input forums

A standing committee would be better able to oversee this approach, akin to a model adopted by the town of Concord, MA (*c.f.*, http://www.concordnet.org/Pages/ConcordMA_Engineering/tmg).

3) General Design Guidelines

The AHTRC has adopted the 1997 VHB guidelines with an interpretive focus articulated in the September 19, 2008 revision of the AHTRC memorandum on roadway design principles. As such, in conjunction with extensive review of comments from residents, we have sought to balance the following aspects of the roadway rehabilitation:

—Safety

—Attention to the complete roadway cross-section, including roadway hardware

—Landscape and rural character, including attention to plantings and shoulders

—Traffic calming, including attention to road width

Safety

The AHTRC reviewed traffic count and accident data provided by the Lincoln Police Department and considered the location of bus stops for children waiting for transport to school. A working analysis of average aggregate motorist speed and volume is available for many portions of the roads subject to rehabilitation in 2009/2010, along with maps of locations where accidents recur.

Roadway Hardware and Signage

Signage for traffic controls and public safety will be provided as required by standard practice. An effort will be made to control the proliferation of signs and to improve their graphics and mounting while adhering to applicable regulations. CEI and the AHTRC will continue to develop the final details. The AHTRC also notes proposals from the HDC to add sign that the borders of the central Historic District to alert motorists that they are entering a historic district. In addition, cable guard rails currently constructed with concrete posts will be replaced with cabled wooden posts.

Landscaping and Shoulders

The character of our roadways is largely influenced by the visual quality of the landscape elements that border the travel surface. Trees, stone walls, and the ground plane/shoulder will be addressed as part of the construction project in the following manner:

—The shoulder area will be modified to remove the buildup of sand and thus improve drainage. The project documents will provide for the reseeding of these areas with a "no-mow" low maintenance grass mix with the accompanying preparation of the seed bed and the addition of top soil as necessary.

—Invasive vines and scrub or dead trees will be removed to allow for improved maintenance and to reveal the beauty of the stone walls.

—Stone wall repairs will be carried out in selected areas

—The contract documents will require a unit price for the installation of shade trees and mid-size trees (*e.g.*, birches). The exact quantity and placement will be determined in the field as construction proceeds.

Traffic Calming

Anticipating elevated traffic volume associated with significant new commercial and residential real estate developments at the local and regional level, we are seeking to add traffic calming elements to the roadway design. This initiative is doubly important with the threat of potentially inducing higher traffic volume and vehicle speeds by simply removing pot holes and laying down new smooth pavement.

As such, the AHTRC recommends select locations for the addition of speed humps, increased enforcement of traffic violations, and provision of new and/or refurbished painted crosswalks for pedestrian service. In addition, the AHTRC recommend elements designed to send visual cues to motorists to moderate their speed including fog lines painted to visually narrow the travel lanes, flush median surface treatments, and roadside plantings that create an arbor effect to contribute to the view of the roadway as a narrow country road.

Paved Road Width

Perhaps akin to the Hippocratic Oath to 'first do no harm,' the AHTRC will seek first to 'widen no road.' Narrow roads are perhaps our greatest traffic calming asset and, fortuitously, the narrow road aesthetic is considered to promote the unique rural character of Lincoln. Apart from Routes 126 and 117 which are to be up to 26' wide, the width of all other subject roadway sis not to exceed 24 feet at any point except at a few places where field conditions may require minor changes. Where currently narrower than 24 feet, there would be no widening at any such point except where field conditions may overrule. Such field conditions exceptions are to be listed by DPW in conjunction with the AHTRC prior to bid document release.

Fog Lines

In general, the AHTRC recommends a 2'/10' fog line and travel lane scheme for safety because fog lines are essential to drivers with compromised night vision as they serve as a visual aid, of course, in fog. This 2'/10' scheme is also seen as a traffic calming measure that gives drivers the impression of a narrower road. Further, short of removing trees to widen roads for full bike lanes, Town support for this 2'/10' scheme has also come from bicycle advocates who see it as a reasonable provision of a "road edge habitat" that is somewhat defined for the benefit of bicyclists.

However, we are informed that road striping on Baker Bridge Road has historically been avoided for the particular scenic character of that road and we propose no changes in this regard. Note also that for the

numbered roads of Route 117 and Route 126, CEI and Chris Bibbo have recommended 11 foot travel lanes to better serve the larger volume on these roads.

Speed Humps

The AHTRC is proposing the addition of two speed humps; one would be located west of Lovelane Farm on Baker Bridge Road, the other east of the DeCordova on Sandy Pond Road. These would be comparable in size and effect to the speed hump near the intersection of Lincoln and Pierce Hill Roads. These installations offer the promise of greater safety from moderated motorist speed and would be accompanied by 2 signs, one in each direction, warning motorists at the approach. This visual prominence could be considered detrimental to historic and rural aesthetic in some areas. However, the AHTRC felt it will be an important safety measure appropriate for a road with this level of traffic.

The AHTRC also anticipates the need to scrutinize future locations where speed humps may be necessary to address increases speeding induced by the 2009/2010 repavement project. The AHTRC tabled without prejudice many design alternatives relating to new proposed speed hump locations with the expectation that future provision will be made to reconsider these options in fuller deliberation. For any future consideration of speed humps, the AHTRC recommends allocation of funds as parts of this road rehabilitation initiative for temporary speed humps to enable testing on-site with traffic counts and public review before and after temporary installation of test speed humps. (*estimate to be provided by Chris Bibbo*)

4) Location-Specific Elements for 2009 Subject Roads

Baker Bridge Road (from Route 126 to Sandy Pond Road; 1.2 miles)

A. Width. The average width of the roadway currently varies from 16.5 to 21.5 feet. Generally the proposed width is 20 feet. The proposed width narrows to 19 feet along a central portion due to trees, shoulder slopes and stonewalls. The proposed width narrows to 17 feet at two locations due to presence of the boulder and a tree.

B. Curbing. Low profile bituminous berm exists at several locations and will be reconstructed. No other new curbing is proposed.

C. Pavement Layout. The AHTRC considered realignment of the road that would move the curve in the road approximately 20” south away from the residence at 67 Baker Bridge Road and toward the driveway entrance to Gropius House. Considerations for this measure include a desire to move the roadway closer to its historic path as well as the traffic calming benefit of a sharper curve. (No new

cost estimated; CEI Picture 49). However, this initiative was tabled because the proposed change was deemed relatively insignificant and would not be safely accommodated by existing elder trees.

D. Paint. No midline striping or fog lines are painted on this historic and scenic road and no new such painting is recommended.

E. Other Items.

Recommended

—A speed hump to be located west of the driveway entrance to Lovelane Farm is recommended. This would serve a traffic calming purpose in a school zone on a road with an evident vehicle speeding concern. ($5,000; CEI Picture 50)

— The AHTRC recommends retaining the existing crosswalk at Baker Ridge Road and Concord Road.

Tabled

—A raised crosswalk near the intersection with Concord Road was considered. This would better provide for the users of the roadside path that parallels Concord Road and would serve as traffic calming measure. However, this measure was tabled for future reconsideration review and experiment with temporary installations as part of an appropriate review process. ($15,000)

—The AHTRC also considered for the aesthetic value on this scenic road a gray chip seal that would lend additional durability and reduced maintenance. However, due to a projected cost of $50,000, we identified this as a low priority item that need not be included in the project.

<u>North Bedford Road</u> (from Route 2 to ~300' south of Route 2A at the border with MMNHP; 0.8 miles)

A. Width. The average width of the roadway currently varies in width from 23 to 25 feet with most of the roadway 24 feet wide. The proposed width is 24 feet.

B. Curbing. In this segment, curbing varies and acute drainage problems are evident. We await specific curbing proposals from CEI, but the existing cape cod berms will be replaced.

—The AHTRC considered, for the benefit of aesthetics and durability, replacement of the bituminous berm with sloped granite curbing south of Morningside Lane. However, due to a projected cost of $54,000 in addition to new provision for drainage (cost not estimated here), we identified this as a low priority item that need not be included in the project.

—Similarly, in addition to the benefit of aesthetics and durability, the AHTRC considered the introduction of sloped granite curbing on the west side of Bedford Road north of Morningside Lane with the objective of introducing a grade difference and physical barrier between the roadway and the roadside path. However, due to a projected cost of $144,000, we identified this as a low priority item that need not be included in the project. The AHTRC has instructed CEI to deal with the drainage

issues in this stretch, and to install cape cod berms to channel water to new and existing drains. Furthermore, given the proximity of the roadside path to the new curb, the path and the curb should not be separated by a gravel or grass strip. As such new bituminous berm will be constructed from Morningside Lane to Route 2A and the roadside path will be overlaid and modified to be located immediately adjacent to the berm in this section.

C. Pavement Layout. No such changes considered.

D. Paint. Midline striping should not change. Fog lines should be approximately 2 feet from the road edge and the travel lane should be 10 feet wide.

E. Other Items.

Tabled

—The AHTRC considered a redesigned crosswalk and speed hump paired near the intersection with Old Cambridge Turnpike/Route 2 that conforms to the design presented by CEI. ($20,000; CEI Sheets 4&5). This measure was proposed to better serve pedestrians and encourage motorists to attenuate their speed as they come from Route 2 into a residential area with many school bus stops. However, this measure was tabled for future reconsideration and experiment with temporary speed humps as part of an appropriate review process.

— The AHTRC considered a speed hump near the border with the National Park Service and roughly northeast of Silver Birch Lane. A public neighborhood meeting was held October 8, 2008 with area residents who were not unified in support of the measure, which was then tabled for future reconsideration and experiment with temporary speed humps as part of an appropriate review process.

—There was also resident petition to upgrade the stonedust roadside path north of Morningside Lane. Due to the projected cost of $86,000 and the lack of jurisdiction, we identified this as a lower priority item for reconsideration at a later time.

<u>Sandy Pond Road</u> (from Baker Bridge Road to ~100 feet west of Lincoln Road at '5 Corners'; 0.6 miles)

A. Width. The average width of the roadway currently varies in width from 22 to 23.5 feet with most of the roadway 22 feet wide. The proposed width is 22 feet.

B. Curbing. There is no curbing on this road and no new curbing is proposed.

C. Pavement Layout. The AHTRC recommends no changes.

D. Paint. Striping is faded here. As permitted by the width of the road, new fog lines are recommended approximately 2 feet from the road edge and midline striping to create travel lanes roughly 10 feet wide. However, because of the marked narrowness of the road, in most areas, fog lines will need to be painted closer to 1-foot from the road edge in this special case.

E. Other Items.

Recommended

—The AHTRC also recommends a speed hump near the trail head east of DeCordova Museum (CEI Picture 52). This measure would better serve pedestrians using the trail and introduce awareness for motorists of the use of this trail site by hikers and school children. This location is the primary link between the schools, the Three Friends Trail, and Lincoln Station with Flint's Pond, Decordova Museum, and the Wheeler Road and Flint's Fields conservation areas. It is viewed as a heavily used route between two major sections of conservation land in Lincoln. It is also one of the emergency exit routes designed to get students from the schools if Ballfield Road is encumbered. This crosswalk would be accompanied by roadway paint and 2 signs, one in each direction, warning motorists at the approach. ($15,000)

Tabled

—The AHTRC favored proposals for a 3-way stop at the intersection with Baker Bridge Road with tightened turning radii at the intersection (CEI to provide illustration). Anticipating extra traffic use of this segment upon the completion of construction of the Deaconess / Groves facility, and observing poor driver behavior at this intersection, CEI and the AHTRC identified this intersection as a good candidate for a 3-way stop. However, upon review, CEI determined that sightlines did not accommodate this change.

<u>Concord Road / Route 126</u> (except for the portion traversed by Rt. 117; 2.0 miles)

A. Width. The average width of the roadway currently varies from 20.5 feet to 33.5 feet. The proposed width transitions from 22 feet at the Wayland Town Line to 24 feet. The width continues at 24 feet to the intersection at Route 117. The width tapers to 22 feet between Route 117 and Codman Road, then widens back to 24 feet. From Baker Farm Road to the Concord Town Line the width is 26 feet.

B. Curbing. In this segment, curbing varies. The AHTRC proposes:

—Rehabilitation of the curbing on the eastern side of this road south of Baker Bridge Road and north of the garage. For the benefit of users of the roadside path which currently adjoins the road edge, the AHTRC suggests inclusion of the roadside path itself for repaving as well as the provision for safety of cape cod curbing of sufficient vertical separation from the main roadway. Note that for the further advantage of improved aesthetics and durability, the AHTRC considered the introduction of sloped granite curbing instead (CEI Pictures 27-31). However, due to a projected cost of $58,000, the AHTRC identified this as a premium element that need not be included in the project and recommended the less expensive option of cape cod curbing.

C. Pavement Layout. The AHTRC recommends consideration of intersection improvements at Old Concord Road conforming to the CEI design. ($5,000; CEI Pictures 20-22)

D. Paint. Midline striping should not change. Fog lines should be >2 feet from the road edge and the travel lane will be 10 foot lanes where road width is less than 26 feet; 11 foot lanes where width is 26 feet.

E. Other Items.

Recommended

— The AHTRC recommends adoption of the 'gateway' treatment proposed by CEI for the border with Wayland as a welcoming cue to drivers entering Lincoln to slow down ($20,000).

Tabled

—The AHTRC considered speed humps south of Old Concord Road ($5,000; CEI Pictures 20-22) as well as a speed hump south of Codman Road ($5,000; CEI Picture 24) as a traffic calming measure. However, the ATHRC elected to defer for review at a later time noting that this is an ambulance route for Lincoln and other neighboring communities.

—The AHTRC also considered the safety benefit of a traffic calming speed hump to be located between Giles and Farrar Roads (CEI Pictures 8-12) that would act in conjunction with the Gateway treatment. However, due to the difficulty of finding a location that provided sufficient sightline placement, the nearby location of a physician practice, and the projected cost of $5,000, the element may be identified as a lower priority item. Nevertheless, we cite it as a point of discussion.

Pending Review

— CEI has proposed to add a roadside path on the west side of Concord Road to connect pedestrians to Old Concord Road. At present, pedestrians there are directed into a drainage swale. The specifics of this proposal are still under review, since the AHTRC has optimism is a solution where the cross walk can be moved closer to the intersection, which may require modification to the existing roadside path grades on the east side of the road.

<u>Trapelo Road</u> (from Lincoln Road at 5 Corners to Waltham line; 1.7 miles)

A. Width. The average width of the roadway currently varies from 22 feet to 26 feet. Most of the roadway is between 24 and 25 feet wide. The proposed width is 24 feet except at three locations where the proposed roadway narrows. In order to avoid removal of a tree, the roadway narrows to 23 feet at one location. To better match existing conditions, the proposed width narrows to 22 feet in the area of a pond between Old Lexington Road and Minebrook Road and the width narrows to 22 feet at the causeway.

B. Curbing. Curbing, if present, varies on this segment. However, one particular area deserves attention. The AHTRC recommends replacing the vertical bituminous curbing on the south side of the road across from the library with sloped granite curbing. This reflects primarily a desire to introduce

improved durability in a high traffic and maintenance area and service to drainage needs. In addition, this treatment is favored for its aesthetic in keeping with the historic character of this central, highly visible area of Town. ($45,000)

C. Pavement Layout. Instead, for the benefit of improved intersection safety, the AHTRC recommends improving the geometry of the intersection of Old Lexington Road with Trapelo Road to tighten turning radii and square the approach of Old Lexington Road to Trapelo Road.

D. Paint. Midline striping should not change. Fog lines should be 2 feet from the road edge and the travel lane should be roughly 10 feet wide. In areas where width is 22 feet, fog lines will be one foot from the edge.

E. Other Items

Recommended

—The AHTRC recommends a crosswalk at Lexington and Trapelo Roads. A flush crosswalk is on the eastern side of the intersection of Trapelo and Lexington Roads of a design similar to the granite inlay crosswalks at '5 Corners.' Serving pedestrians on the trails and roadside paths in this area and used in conjunction with a redesigned 'Historic District Gateway,' this measure would reinforce cues to slow down driving west into '5 Corners' for the benefit of pedestrians. This crosswalk would be accompanied by roadway paint and 2 signs, one in each direction, warning motorists at the approach.

—The AHTRC recommends several treatments at this busy intersection that serves as the entrance point for motorists crossing the reservoir causeway from Waltham at the intersection of Trapelo Road and Old County Road. In combination, these elements would give westbound travelers a clear signal to attenuate their speed before ascending the hill to areas with high residential pedestrian use and school bus stops. These recommended treatments include:

a) Modification of the turning radii on both the northwest and southwest corners to reduce pavement and slow vehicle turns. This measure would encourage safer speeds for southbound motorists turning right from Old County Road onto Trapelo Road and for eastbound motorists turning left from Trapelo Road onto north Old County Road. The measure would create additional yard frontage and move motorists incrementally further away from the house at 172 Trapelo Road. (no significant additional costs; CEI Sheet 1)

b) The landscape design proposed by CEI integrating—

i. Provision of native plantings in accordance with Lincoln Garden Club recommendations for select shrubs and trees

ii. A new stone wall on the southwest corner to add visual quality and discourage roadside parking

iii. Rebuilt wall on the northwest corner to bring it closer to the reduced pavement and discourage roadside parking. ($24,000; images to be confirmed by CEI).

c) Installation of an elongated island, flush with the pavement, which would taper from a few inches approximately 200 feet west of the intersection to roughly three feet at the intersection. This would be similar to simply painting the outline of a narrow island; however, the AHTRC recommend a flush variation in the surface with inlayed granite cobble akin to the crosswalk design at '5 Corners.' This measure would also better define expectations for the path to be followed by Old County Road motorists turning onto Trapelo Road. Furthermore, for all motorists using Trapelo Road eastbound and westbound, it is intended to encourage safer speeds with the appearance of narrower travel lanes. Yet, at the same time, the flush surface would not compromise safe vehicle operation. Do note, however, that this island imprint would be a very prominent visual change that could be considered urban in character. ($2,000; CEI Picture to follow)

Tabled

—The AHTRC recommends no road closure. The AHTRC considered the closure of Old Lexington Road east of Lexington Road. As part of the Trapelo Road corridor, closure of this segment was identified as an opportunity to increase safety by removing a point of potential traffic conflict and by counteracting cut-through traffic. At the same time, this provision would create a 'Historic District Gateway' framed within a small triangular plot of Town-owned land that could be landscaped in a way to that would cue motorists to slow down as they travel west into a historic district of Town. Westbound Trapelo Road travelers currently using Old Lexington Road as a cut-through to get to Bedford Road north of the library would be discouraged from that practice. Motorists who currently enter Trapelo Road eastbound from Old Lexington Road would be encouraged to make the left hand turn from the Lexington Road intersection onto Trapelo Road. ($5,000; CEI Picture 7) However, in consultation with the HDC, this proposed change was not deemed to have sufficient merit from the standpoint of historical character and the benefit were not sufficiently clear at this time.

—The AHTRC considered *raised* crosswalk at Lexington Road of a design similar to the granite-lined crosswalks at '5 Corners.' Serving pedestrians of the trails and roadside paths in this area, if used in conjunction with the redesigned 'Historic District Gateway,' this measure would reinforce cues to slow down driving west into '5 Corners.' ($15,000; CEI Picture 4) The proposal was tabled for future reconsideration and experiment with temporary humps as part of an appropriate review process.

—The AHTRC considered a speed hump between the intersection at Page Road/Winter Street and the Bakinowski residence at 99 Trapelo Road. This measure would address a problem experienced by

residents turning left from Page Road to drive west on Trapelo Road. Because the average speed of eastbound motorists exceeds the posted speed limit by 20% in this area, left turns are difficult. A 20 mph speed hump would encourage motorists to attenuate their speed in this region. This location is considered compatible with sightlines for Trapelo Road motorists traveling in either direction and mitigates a visibility problem for motorists emerging from Page Road. ($5,000; CEI picture to follow) However, the proposal was tabled for future reconsideration and experiment with temporary speed humps as part of an appropriate review process.

—The AHTRC considered a proposal to introduce a four-way stop at the intersection at Page Road/Winter Street with Trapelo Road, but felt that the sightlines were not conducive to such treatment and that the ratio of cross-traffic would not sustain the warranting process needed for approval.

—A speed hump located on the causeway just east of Old County Road was also considered. This would encourage motorists to slow their speeds as they approach both a busy intersection (westbound) and a Waltham school zone (east bound). Such a consideration for the benefit of Waltham in this area may encourage them to remove the westbound "End Speed Zone" sign near the town line with Lincoln, a road sign that the AHTRC views as unnecessarily detrimental to the safety of Trapelo Road in Lincoln. There was concern, arising from the fact that this is a no salt area, that motorists new to Lincoln may be caught by surprise by this treatment. Yet, the sightlines are especially clear in this area and should permit sufficient advance observation of this traffic calming measure. Located at a point distal to Town center, the disruption to public safety vehicles would be minimal. This option was favored over rumble strips as less noisy. ($5,000; CEI picture to follow) Nevertheless, the proposal was tabled pending further review and experiment with temporary speed humps.

ADDENDUM

January 23, 2009

To: Board of Selectmen
From: Ad Hoc Traffic and Roadside Committee

Re: 2009/2010 ROADWAY REHABILITATION PROJECT

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In response to requests made by the BOS January 12, 2009, please accept the following addendum to the AHTRC's 12/18/08 Recommendations.

1) Attached please find an updated **Design Alternatives Decision Matrix** revised from 1-10-09 to include traffic data and rationale commentary for speed humps and crosswalks.

Note that the AHTRC's overarching rationale in his work is based on concern that paving the roads will likely invite new increased traffic volume and elevated vehicle speeds. Consistent with our earlier memorandum on roadway design principles, the AHTRC reiterates that with each design proposal, we aim to strike the optimal balance in achieving these goals:

GOALS **Preservation of rural character**
Management of reasonable traffic flows in volume and speeds
Safety for motorists, pedestrians, bicyclists
Reduction of noise and other environmental impacts
Maintenance of public safety response

In general, all roadway design proposals should be considered against an array of factors, many of which are cited in the decision matrix (e.g., sightlines, costs). In addition, specific features may be considered for crosswalks and vertical deflection installations.

C**rosswalk proposals** should be favored if they:

—Provide continuity of roadside path system at intersections (e.g., Silver Hill at Trapelo)
—Connect secondary roads lacking roadside paths to the roadside path system that follows primary roads (e.g., Todd Pond at Lincoln)
—Provide a roadway crossing point for major conservation trail segments
—Serve a major school bus loading area
—Connect public buildings with each other or with parking sites (White Church to Library)
—Provide safe crossing points in areas of frequent pedestrian traffic such as higher density housing, schools, retail/commercial areas, etc.(Lincoln Station)

Proposals for **speed humps or vertical deflection treatments** should be favored if they:

—Address a notable traffic problem (e.g., speeds significantly exceed posted limits; elevated accident rates; confused driver behavior)
—Satisfy the balance of opinion that the installation will succeed in calming traffic
—Serve pedestrian crosswalks in densely developed areas
—Offer sufficient safety benefit to justify associated liabilities (e.g., response times, noise, aesthetics of signage)

2) AHTRC's 12/18/08 Recommendations included advocacy for an on-going program of on-site testing in select locations where speed humps merit consideration. To permit this testing program, an allocation of approximately $8,000 should be reserved for the purchase of a pair of temporary, removable speed humps.

3) We would like to note that there are three areas pending further review that bear on the Phase I 2009 roadway rehab project.

a) Bedford Road. There was a late proposal for an island treatment for the intersection of Morningside Lane and Bedford Road. CEI and AHTRC believe this proposal merits further review. At their November 2008 neighborhood meeting with the AHTRC, residents surprisingly voiced openness to sacrificing Morningside Park in order to accommodate a horizontal deflection in the roadway. This new development re-opened previous planning discussion that had yielded no workable proposal. Also, these same north Bedford Road residents have been clear that they would like to calm vehicular traffic on north Bedford Road (though not with speed humps), that island proposals have been considered by Town traffic committees before, and that this area does feature notable concentration of families with children. Moreover, because of the close proximity of the roadside path to the roadway and the resolution of the AHTRC that no speed hump traffic calming installation is appropriate here, the AHTRC recommends that extra review be permitted to satisfy all stakeholders that all options were considered for optimal traffic management in this area. However, we also note that this proposal comes late in the Phase I calendar, that traffic and accident data do not underscore an acute need for a major treatment compared to elsewhere in Town, and that no satisfying design proposal may ultimately emerge to be recommended by the AHTRC.

b) Signage. The AHTRC remains unsatisfied with design proposals for signage and disinclined to adopt the day-glow orange coloration and flying angle geometries of some proposals from CEI. We plan to continue to engage CEI to refine this element of the roadway design project.

c) Trees. Tree Warden Ken Bassett will continue to lead the dialogue between CEI and AHTRC regarding how roadside tree plantings are handled. We anticipate that some funds will be

allocated for the purchase and planting of trees under this Town project. However, we anticipate this component should be directed to a local contractor that specializes in landscaping and not ~~direct it~~ to the road construction contractor.

4) The AHTRC would like to reiterate for clarification, two points that arose from the discussion January 12, 2009.

a) Regarding curbing, we expect that no vertical bituminous curbing will be introduced as part of this road rehabilitation project. New curbing will either be of a Cape Cod berm style or sloped granite.

b) Regarding guardrails, we anticipate that no concrete post treatments will be used or refurbished and that any needed guardrails will be constructed of wood posts and cable.

5) We note that while Public Safety and the ConComm, Historic District Commission, and Planning Board have been invited to provide written comments on these recommendations, no written comments have been provided to the AHTRC at this time. Town residents in general have had two exposures to these recommendations over the past week through (1) the televised BOS meeting January 12, 2009 and (2) the posting on the AHTRC webpage.

6) The AHTRC recently lost one member. We request that at least one replacement (preferably two) be appointed to the AHTRC to fill John Caswell's absence.

7) Responding to Selectman Gary Taylor's proposal January 12, 2009, the AHTRC concurs that a single midline strip on Baker Bridge Road is appropriate from the vicinity of Granville Road to Sandy Pond Road. The AHTRC recommends this revision be reflected in design documents.