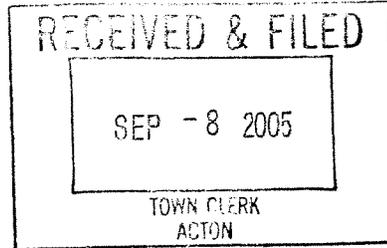




Planning Board



11/14 (4)
TOWN OF ACTON
472 Main Street
Acton, Massachusetts 01720
Telephone (978) 264-9636
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www.acton-ma.gov

DECISION

05-05

Scenic Road Hearing Tree Removal on Pope Road

August 23, 2005

Decision of the Acton Planning Board (hereinafter the Board) on the proposed removal of five trees on Pope Road in the vicinity of the Brabrook Road intersection. Pope Road is a scenic road under Chapter J of the Bylaws of the Town of Acton. A hearing on the proposed removal was duly advertised in the newspaper and the subject trees have been marked in the field. The public hearing was held on August 23, 2005. Board members Gregory E. Niemyski (Chairman), Christopher R. Schaffner (Vice Chairman), William F. King (Clerk), Gary R. Sullivan, Ruth M. Martin, Edmund R. Starzec, and associate member Bruce Reichlen were present throughout the hearing. Also present was the Acton Tree Warden, Dean Charter. The minutes of the hearing and submissions on which this decision is based upon may be viewed to in the Planning Department or the Town Clerk's office at the Acton Town Hall.

1 EXHIBITS

Submitted for the Board's deliberation were the following exhibits:

- 1.1 Legal notice.
- 1.2 A plan entitled "Tree Removal Plan for Ellsworth Village LLC", dated 11/19/04, drawn by the Stamski and McNary, Inc., Acton, MA, consisting of one sheet.
- 1.3 Letter from George Dimakarakos, P.E., Stamski and McNary, Inc., to the Planning Board and Tree Warden dated 6/21/05.
- 1.4 Letter from Dean Charter, Tree Warden, to George Dimakarakos, P.E., Stamski and McNary, Inc. dated 8/23/05.
- 1.5 Letter from George Dimakarakos, P.E., Stamski and McNary, Inc., to Dean Charter, the Tree Warden, dated 8/23/05.

2 FINDINGS and CONCLUSIONS

Based upon its review of the exhibits and the record of the proceedings the Board finds and concludes that:

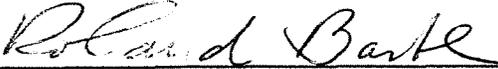
- 2.1 The trees proposed for removal are: one 36" DBH Oak, one 30" DBH Oak, one 12" DBH Hickory, and two 20" DBH Oaks.
- 2.2 The removal of at least three of the trees, the 12" DBH Hickory and the two 20" DBH Oaks, is necessary for sight distance and other safety improvements at the Pope Road and Brabrook Road intersection as part of the Ellsworth Village development.

2.3 The removal of the 36" DBH Oak and the 30" DBH Oak may be necessary to improve sight distance at the Pope Road and Brabrook Road intersection.

3 BOARD ACTION

The Board hereby consents to the removal of the one 12" DBH Hickory and two 20" DBH Oaks. After the removal of the three trees, the Board will re-evaluate the sight distance at the Pope Road and Brabrook Road intersection.

Signed on behalf of the Acton Planning Board


Roland Bartl, AICP, Town Planner

Copies furnished:

Engineering Department
Tree Warden
Town Clerk
Town Manager

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Design Speed (mph)	Assumed Speed for Condition (mph)	Brake Reaction		Coefficient of Friction f	Braking Distance on Level (ft)	Stopping Sight Distance	
		Time (sec)	Distance (ft)			Computed ^a (ft)	Rounded for Design (ft)
20	20-20	2.5	73.3-73.3	0.40	33.3-33.3	106.7-106.7	125-125
25	24-25	2.5	88.0-91.7	0.38	50.5-54.8	138.5-146.5	150-150
30	28-30	2.5	102.7-110.0	0.35	74.7-85.7	177.3-195.7	200-200
35	32-35	2.5	117.3-128.3	0.34	100.4-120.1	217.7-248.4	225-250
40	36-40	2.5	132.0-146.7	0.32	135.0-166.7	267.0-313.3	275-325
45	40-45	2.5	146.7-165.0	0.31	172.0-217.7	318.7-382.7	325-400
50	44-50	2.5	161.3-183.3	0.30	215.1-277.8	376.4-461.1	400-475
55	48-55	2.5	176.0-201.7	0.30	256.0-336.1	432.0-537.8	450-550
60	52-60	2.5	190.7-220.0	0.29	310.8-413.8	501.5-633.8	525-650
65	55-65	2.5	201.7-238.3	0.29	347.7-485.6	549.4-724.0	550-725
70	58-70	2.5	212.7-256.7	0.28	400.5-583.3	613.1-840.0	625-850

1 mph
87th %ile
2000
100% Red.
S.R.

^aDifferent values for the same speed result from using unequal coefficients of friction.

Table III-1. Stopping sight distance (wet pavements).

$$d = \frac{V^2}{30f}$$

where: d = braking distance, ft;
V = initial speed, mph; f = coefficient of friction

In this formula for braking distance, V is a single value that is representative of the range. Measurements show that the braking distance increases as the initial speed increases. The braking distance also depends on many physical elements such as the coefficient of friction, tire tread pattern and depth, pavement surface, and the pressure of the vehicle. The several variables are not included in the standard formula. The value of f is a constant friction factor. The value of d is calculated on this basis for some speeds and distances only.

Figure III-1A illustrates friction coefficients for wet and dry conditions. Curves 1 to 6 are from measurements of forward skidding on wet and dry conditions. Several values of friction were computed by using the standard stopping formula. Curves 7 to 10 are several curves of a study (5) in which the dry condition by three different tests that included stops from several speeds. Curve 11 is the calculated value of the average of all stops measured. The comparison of the results (at low speeds) shows that the wet condition is what better than the average or standard value.

Because of the lower coefficient of friction compared with dry, the wet condition is used for design. The criteria should represent not only



Planning Department

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MEMORANDUM

To: Bruce Stamski, Director of Public Works **Date:** September 29, 2005
From: Roland Bartl, AICP, Town Planner *RB*
Subject: 30 mph speed limit sign on Pope Road

I am writing to inform you that the Planning Board at its meeting on September 27, 2005 decided to support and urge a relocation of the 30 mph speed limit sign on Pope Road from its present location south of Brabrook Road to a location +/- 200 feet north of the Brabrook Road. The desired effect would be a reduced vehicle speed on Pope Road southbound at the intersection. The developer of Ellsworth Village is prepared to make the change, but he needs your guidance in order to obtain any approvals that might be necessary.

Thank you for assistance.

Cc: Planning Board
James B. Fenton
Don P. Johnson

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Bruce M. Stamski, P.E.
Town Engineer/Director of Public Works

October 7, 2005

Board of Selectmen
Town of Acton
472 Main Street
Acton, MA 01720

Re: Recommendation for Advisory Traffic Sign
Pope Road near Brabrook Road

Dear Board Members:

The Acton Planning Board on September 27, 2005 voted to support and urges the relocation of the 30mph speed limit sign from its present location south of Brabrook Road to a point 200 feet+/- North of Brabrook Road. The objective is to slow traffic at the intersection of Brabrook and Pope. I concur with this recommendation but have the following problem. The change in location of this sign would require modification of the Acton Traffic Rules and Orders and approval of the speed zone change by Mass Highway. The speed zone change will require a traffic study to Mass Highway standards for speed zoning. This could take several months.

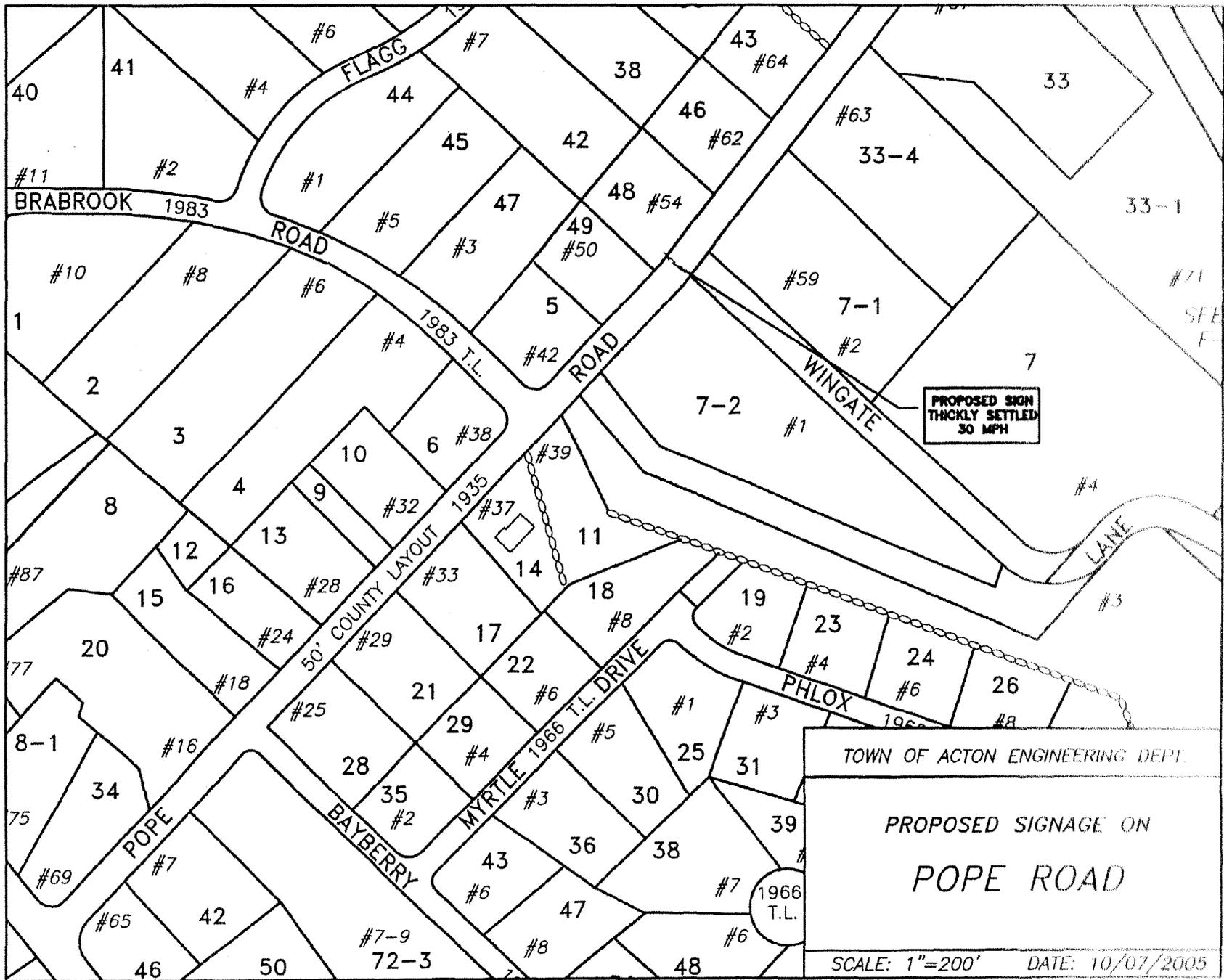
At this time I recommend we take the following action for the following reasons.

The "prima facie" speed limit for thickly settled areas is 30 mph. A thickly settled area is where houses are less than 200 feet apart. This office has determined that Pope Road is thickly settled to a point 350 feet north of Brabrook Road (in the vicinity of Wingate Drive). Massachusetts Speed Law does not allow prima facie speed limits to be posted. Drivers are supposed to recognize this situation and drive accordingly. It is my engineering judgment that a prudent and reasonable driver can not determine that Pope Road is thickly settled at this location. I recommend an Advisory Sign "Thickly Settled" with a 30mph speed plate be installed in the vicinity of Wingate Drive warning drivers of this change in road status. Advisory signs are yellow in color and do not carry the same enforcement level as a white speed limit sign. They do not need State approval and are not adopted in the Traffic Rules and Orders.

I will initiate contact with Mass Highway to determine the extent of a study needed to modify the speed zone in this area. Hopefully the work will be minor and we can change the advisory speed sign to an actual speed zone.

Sincerely,

Bruce M. Stamski, P.E.
Cc
Police Dept.
Planning Dept.



STAMSKI AND MCNARY, INC.

80 Harris Street
Acton, Massachusetts 01720
(978) 263-8565
FAX (978) 263-9883

WILLIAM F. MCNARY, P.L.S.
JOSEPH MARCH, P.E., P.L.S.

October 11, 2005

Acton Planning Board
c/o Roland Bartl, Town Planner
472 Main St
Acton, MA 01720

Re: Ellsworth Village
Sight Distance at Brabrook/Pope Rd intersection

Dear Mr. Bartl,

In response to the Board's request to reevaluate the Brabrook and Pope Road intersection for adequate sight distance we offer the following:

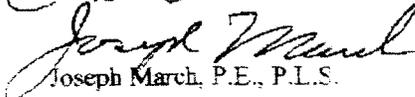
The most desirable situation for the intersection, from a sight line perspective, would be achieved by removing the two remaining large oak trees in the embankment on the north side of Brabrook Road, as proposed on the Ellsworth Village plans. However, it is our opinion, that the "stopping sight distance"(SSD) measured along the southbound travel lane on Pope Road is adequate without the removal of the trees. A 330 foot SSD was measured from 3.5 feet above grade traveling south on Pope Road and at a 2 foot taillight height in the travel lane adjacent to Brabrook Road. A 327 foot SSD is adequate when calculated in accordance with the American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, Fourth Edition, pp.113-114.

We also concur with the analysis and recommendations in a letter from David J. Friend of Transportation Planning Services (TPS), dated October 7, 2005. Therefore, we recommend that, at a minimum, an intersection warning sign be located 500 feet north of the Brabrook/Pope Road intersection, as outlined in the TPS letter.

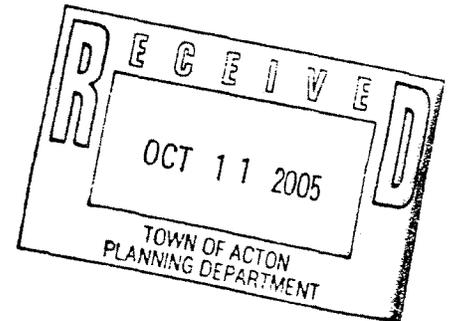
Please call our office if further information or clarification is needed.

Respectfully yours,

Stamski and McNary, Inc.

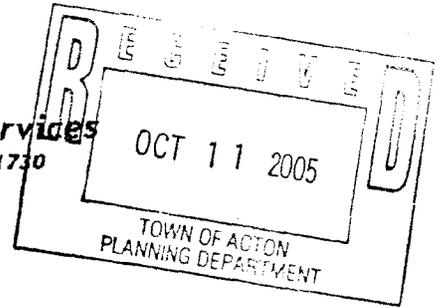

George Dimakarakos, P.E.

Joseph March, P.E., P.L.S.

cc: Ellsworth Village, LLC





David J. Friend
Transportation Planning Services
19 Notre Dame Road, Bedford, MA 01730



TO: Planning Board
Town of Acton

FROM: David J. Friend
Transportation Planning Services
Bedford, MA 01730

CC: Ellsworth Village, LLC
Acton, MA 01720

Stamski and McNary
80 Harris Street
Acton, MA 01720

DATE: October 7, 2005

SUBJECT: Adequacy of Sight Distance at Intersection of Brabrook Road and Pope Road
Ellsworth Village - Acton, MA

In my *Traffic Impact Study* for Ellsworth Village (December 2004), it was pointed out that the elevation of the edge of the pavement, which included 3 large oak trees, obstructed the line of sight line between motorists traveling southbound on Pope Road and those exiting Brabrook Road. When measured from a distance of approximately 10' from the edge of the pavement on Pope Road, a clear sight line of only 100' (distance to first large oak tree in right-of-way) existed for those exiting Brabrook Road. A recent field review of conditions conducted by the Town of Acton Engineering Department (see Inter-departmental Communication from Engineering Department to Planning Department dated September 9, 2005) found that the driver's sight distance had not improved after changes to the road shoulder had been made in front of 42 Pope Road. No improvements were found for the simple reason that the recommended removal of several large oak trees (and the slope surrounding their bases) had not occurred.

Moving the point of measurement closer to the edge of the pavement on Pope Road will undoubtedly increase the length of the clear sight line. As indicated correctly by the Engineering Department staff, it is possible that "the maximum distance for drivers exiting Brabrook Road and traveling southbound on Pope Road to make eye contact is between 210 and 230 feet" [Note: it is assumed that this measurement was made from a height of 3.5' (departing vehicle) to 3.5' (approaching vehicle), but it is not known at what distance from the edge of pavement it was made]. Nevertheless, even with 230 feet of clear sight line, the departure sight distance available at the intersection in this direction will continue to be inadequate for the 85th percentile speed of southbound traffic on Pope Road unless both of the trees are removed and the area is contoured substantially lower.

While desirable, an adequate departure sight distance is not typically viewed as critical to the safety of movements at an intersection - especially at an existing intersection that has provided safe access to a residential area for many years. What is critical is the adequacy of the stopping sight distance, and that is typically measured along the travel lane, not from a location 10' from the edge of pavement.

Transportation Planning Services

- Traffic Impact Studies
- Traffic Calming Plans
- Corridor Studies
- Multi-Modal Planning
- Fiscal Impact Assessments
- Parking Studies
- Community Master Plans
- ITS Technology Reviews
- Transport Risk Assessment

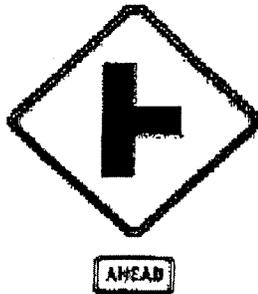
Acton Planning Board

Ellsworth Village

As the Acton Engineering Department correctly reports, "a vehicle on Pope Road traveling southbound can see a 2-foot high object on the sideline of Pope Road at Brabrook Road at a maximum distance of about 260 feet" (*emphasis added*). My observations and measurements confirm this finding. As shown in Figure 4 of the Traffic Impact Study, however, I believe that over 330 feet of clear sight distance exists for those traveling southbound on Pope Road when measured from a height of 3.5' (height of driver's eye in a vehicle approaching Brabrook intersection) to an object height of 2.0' (taillight height of a passenger car) located in the travel lane at Brabrook Road. This distance is adequate for the 85th percentile speed of 41 mph that was found in the southbound direction on Pope Road.

It is also important to recognize that the 2.0' object height that is used in determining available stopping sight distance is considered arbitrary and was chosen because it is believed to represent the size of an object "that involves risks to drivers and can be recognized by a driver in time to stop before reaching it."¹ If the purpose of establishing adequate stopping sight distances at an intersection is to minimize (if not eliminate) the potential for conflicts between vehicles, the more appropriate object height at Brabrook Road would be 3.5' (the height of the high mounted taillight on a car). If the sight distance for those traveling southbound on Pope Road were measure from an approaching vehicle height of 3.5' to an object height of 3.5' at Brabrook Road, an even longer stopping sight distance would exist in this direction.

In conclusion, and assuming that the provision of adequate stopping sight distance (not departure sight distance) is of paramount importance at the Pope Road/Brabrook Road intersection, I believe that safe conditions exist at the intersection in both directions. I am also not aware of motor vehicle accident data that would indicate that this intersection on Pope Road - an existing intersection where traffic has routinely exited Brabrook Road for many years - presents a safety concern. Nevertheless, it is strongly recommended that a warning sign be placed on the southbound side of Pope Road in advance of Brabrook Road to reinforce the posted speed limit, enhance the safety of travel along this section of the street, and address the inadequate departure sight distance. It is specifically recommended that an intersection warning sign for a side road (W2-2) with a supplemental "ahead" plaque (W16-9p) be installed on the westbound side of Pope Road at a location approximately 500 north of its intersection with Brabrook Road. These signs will reinforce the posted speed limit, alert drivers traveling southbound that there may be entering/exiting movements ahead, and generally enhance safety along this section of Pope Road.



¹ AASHTO, *A Policy on Geometric Design of Highways and Street* (2001), p. 127.



Planning Board

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INTERDEPARTMENTAL COMMUNICATION

To: Board of Selectmen **Date:** October 11, 2005
From: Planning Board
Subject: Intersection Improvements at Pope and Brabrook Road

In connection with the Ellsworth Village project in East Acton, the Planning Board has on numerous occasions heard testimony and received professional evaluations regarding the apparent lack of sight distance at the Pope and Brabrook Roads intersection:

- a. At first, the traffic consultant of the Ellsworth Village developer recommended "desirable" changes to improve sight distance between Pope Road southbound traffic and cars exiting Brabrook Road. The recommendation suggested the removal of three public shade trees and the lowering of the shoulder grade on the westerly side of Pope Road looking north on Pope Road. The Acton Engineering Department also noted the lack of adequate sight distance.
- b. Residents in the area agree that sight distance for drivers exiting Brabrook Road "feels" unsafe. They also report numerous "close calls" although the Police Department has no record of intersection related accidents in that area. Several residents also expressed concerns with crossing the street to reach the sidewalk on the other side of Pope Road and with respect to children waiting at the intersection due to purportedly high vehicle speeds on Pope Road. Apparently this is a school bus stop.
- c. The Planning Board in its Ellsworth Village special permit required the improvements as recommended by the developer's consultant subject to further approval after a public shade tree hearing.
- d. At the shade tree hearing Dean Charter, Acton's Tree Warden, stated his objection to the proposed removal of two significant trees. The trees in question are stately oak trees although they are not the most significant examples. The Tree Warden did agree to the removal of several other less "valuable" trees.
- e. In an effort to find a solution, the Planning Board agreed on an interim measure to remove the trees that the Tree Warden agreed to cut down and to re-grade the shoulder somewhat taking care not to injure the two trees that the Tree Warden sought to protect. This work has been done.
- f. Subsequent inspections by the Engineering Department and the developer's traffic consultant yield mixed reviews.
- g. Engineering believes that sight distance is still insufficient. It is the Planning Board's understanding that the Engineering Department has proposed a "thickly settled" advisory sign for a location north of the intersection, which carries a "prima facie" speed limit of 30mph. The posted speed limit at the intersection is 35 mph. The 85th percentile speed has been measured at 41 mph. The Engineering Department also seems to be prepared to

look into posting a 30 mph speed zone north of the intersection and to find out what level of study and documentation MassHighway requires for such a change.

- h. The developer's traffic consultant and site engineer believe that the intersection would be reasonably safe with an advanced intersection warning sign, but concede that the improvements so far fall short of the desirable level of improvement.
- i. Both Engineering and the traffic consultant seem to agree that changes in speed limit postings will help some for enforcement purposes, but will not fundamentally change drivers' behavior, i.e. the 85th percentile speed in this area.
- j. While there seems to be sufficient stopping sight distance in Pope Road for southbound travel at the 85th percentile speed (drivers seeing objects in the road), the sight distance for drivers exiting Brabrook Road (looking from a location 5-10 feet off the side edge of Pope) is significantly less. As a result drivers can exit Brabrook Road at a moment when drivers on Pope Road have already approached close enough to be below the threshold for safe stopping.

Based on the testimony received and outlined above, the Planning Board has reached the conclusion that it would be most prudent to pursue

1. The removal of the other two oak trees and further lowering of the shoulder grade as originally proposed to align the viewing sight distance from Brabrook Road with the safe stopping sight distance for southbound traffic on Pope Road. The Planning Board understands that, following the Tree Warden's ruling, this would now have to come before the Board of Selectmen for a definitive ruling.
2. Post a "thickly settled" sign as an immediate measure to enable enforcement of a 30 mph speed at the intersection.
3. If appropriate and deemed effective by the Engineering Department, also post an intersection warning sign.
4. A 30 mph speed zone for Pope Road southbound traffic approaching the Brabrook Road intersection from the north following necessary MassHighway approvals.

Cc: Tree Warden
Engineering Department
James B. Fenton (Ellsworth Village)

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Planning Department

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MEMORANDUM

To: Don P. Johnson, Town Manager
Dean Charter, Tree Warden
Date: October 12, 2005

From: Roland Bartl, AICP, Town Planner *R. B.*

Subject: Intersection Improvements at Pope and Brabrook Roads

Attached please find a letter from the Planning Board to the Board of Selectmen with recommendations for intersection improvements at Pope and Brabrook Roads.

One of the Planning Board's recommendations is for the removal of two remaining oak trees in the Pope Road right of way to improve sight distance at Brabrook Road. Please consider this letter a request of the Planning Board to initiate the legal steps and procedures required to reconsider the trees' removal.

Further, please advise the Planning Board if and when the matter will be scheduled before the Board of Selectmen.

Thank You

Cc: Planning Board
Engineering Department