Technical Memorandum 3

Stow Lower Village

Traffic Study and Conceptual Design

Alternatives Analysis

Stow, Massachusetts

Fay, Spofford & Thorndike

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1.0 EXECUTIVE SUMMARY

Technical Memorandum 3 builds on the results of Technical Memorandum II by analyzing projected 10-year horizon AM and PM peak hour traffic operational conditions for the 2,400-foot segment of Great Road that passes through Stow Lower Village between Bradley/Deerfield Lanes and White Pond Road. Projected year 2015 traffic operations were evaluated for various alternatives under the following assumptions:

- AM and PM peak hour traffic volumes measured in 2005 were increased by 10% (slightly less than 1% per year) including all driveway volumes counted.

- The Bose Corporation Development was assumed fully built out. Add-on traffic volumes contained in the *'Traffic Impact and Access Study, Proposed Bose Corporation Response to Comments'*, GPI, October 2003 were added to the background volumes assumed in the traffic stream.

- In addition to the Bose Corporation assumption, new traffic was assumed to be generated by three unapproved retail developments totaling 45,500 square feet of new buildings in Stow Lower Village. These include:

    - Traffic generated by a 5,500 square foot expansion of the Stow House of Pizza, under review at this time.
    - Unspecified 10,000 square feet of additional shopping center retail on the Stow Plaza site (coordination with Mr. Joel Kadis); and
    - Unspecified 30,000 square feet of new shopping center retail on the 4.5-acre former Erkinnon parcels (now owned by Mr. Richard Presty).

    Neither Stow Plaza nor the former Erkinnon parcels site owners have prepared specific plans for development. Therefore, both these development assumptions are highly speculative and are subject to change once specific development plans are formulated.

- Potential 'new' retail vehicle trips related to the three assumed Stow Lower Village developments was added at 75% of the total unadjusted ITE Trip Generation report trip generation estimates. This accounts for 'pass-by' traffic diversions. MEPA traffic analysis guidelines allow an assumption that pass-by traffic was represents no more than 25% of new site-generated vehicle trips. Additional new driveway trips were distributed in a manner consistent with the driveway volumes counted during the Stow Lower Village count program documented in Technical Memoradum II.

In aggregate, the projected year 2015 AM and PM peak hour volumes are expected to be approximately 18-20% higher than those measured in 2005 with the traffic assumptions made. This represents growth rate in traffic of approximately 1.7-1.8% annually.

In total, four alternatives were evaluated. In addition to the basic 'No-Build' Alternative, three Stow Lower Village Build 'mix and match' alternatives were evaluated. They include Alternative 1 – Sidewalk, Curb Cut Consolidations, and Crossing Enhancements (essentially an updated version of the Cecil Group Inc. option developed in 2002); Alternative 2 – Roundabout and One-way Pair; and Alternative 3 - Traffic Signal Control.

In addition to the four primary alternatives, FST evaluated two sub-alternatives – an assumed restriction on left turns from Great Road to Pompositticut Road and a potential new roadway between Pompositticut Road and Great Road. Both of the sub-alternatives were found to be deficient from an impacts/benefits perspective.

The need to consolidate curb cuts in Stow Lower Village is an ongoing concern for the Town. All alternatives assume the Town will pursue the consolidation of curb cuts to the maximum extent possible and, in general, better curb cut controls. Ideally, some or all of the diverse office/retail uses on the south side of Stow Lower Village could agree to provide rear connections between parcels to minimize the need for curb cuts on Great Road.

Generally, it was assumed only one through lane would be provided in each direction regardless of the alternative under consideration. Furthermore, we assume that turning movement lanes such as the continuous two-way left turn lane may be selectively employed to serve left or right turning movements. *Because the one through lane in each direction creates a bottleneck condition in the peak direction of travel, none of the Build alternatives results in the elimination of traffic congestion in Stow Lower Village.*

Regardless of how much development occurs in Stow Lower Village at the pizza/bank site, on the former Erkinnon property, or at Stow Plaza, by far the largest component of traffic in Stow Lower Village is and will continue to be *through traffic.* The recent count data and peak period observations indicate the peak directional flow of peak traffic is approaching the capacity of Great Road to accommodate it. As traffic demands grow, it is expected that the number of hours when congestion occurs will expand; peak hour peak direction volumes will not grow as much as traffic during near peak hours as the peak hour spreading phenomenon occurs.

Nonetheless, by providing enhancements for pedestrian crossings and creating gaps in through traffic the circulation system in Stow Lower Village has the potential to be a much more attractive and functional than the present situation allows.

2.0 INTRODUCTION

FST was retained by the Town of Stow, Massachusetts to conduct a traffic analysis of the approximately 2,400-foot segment of Great Road (State numbered Route 62/117) that passes through the Stow Lower Village area. Great Road generally runs east-west, stretching from Maynard to Bolton within the Town of Stow. This study focuses on the portion of Great Road between Bradley Lane to the west and White Pond Road to the east.

This Technical Memo follows up on coordination meetings with the Stow Lower Village Committee and Stow Planning Board and the findings of Tech Memos I and II.

Alternatives evaluated were selected in coordination with the Stow Lower Village Committee. Alternatives are set up to provide the committee with 'mix and match' sub-options. With the exception of the No-Build Alternative, each alternative assumes major improvements to the pedestrian walking environment -- new sidewalks, landscaping, and lighting along both sides of Great Road. Improvements are generally in accordance with the Committee's preferred concept as identified by the Cecil Group in 2002 and as confirmed by the Committee during October and November coordination meetings. Traffic projections and level of service analyses were performed for the following alternatives:

- No-Build Alternative The No-Build assumes the same lane configurations on Great Road as existing with no changes in sidewalks or other crossing amenities other than routine maintenance.

- Alternative 1 - Sidewalks, Curb Cut Consolidations, and Crossing Enhancements Alternative 1 assumes the same lane configurations on Great Road as existing with new sidewalks and selected pedestrian crossings with limited medians at the following locations:

    - East of Elmridge Road
    - East of Stow Plaza East Driveway
    - East of White Pond Road

  Unlike the No-Build Alternative, Alternative 1 assumes that adjacent curb cuts are consolidated to the maximum extent possible. It also assumes a significant traffic operational change. Red Acre Road between Great Road and Gardner Road becomes 1-way northbound. The Stow Plaza east driveway is located easterly lining up with the frontage road to the east portion of Stow Plaza. Gardner Road remains two-way, like the other two alternatives, but is truncated at the relocated Stow Plaza East driveway. Large portions of Alternative 1 can be implemented independent of Alternatives 2 and 3 and is not mutually exclusive. Alternative 1 creates gateways, five medians for pedestrian crossings, improves the visibility of pedestrian crossings, and creates a fully functional sidewalk system to augment better defined crossings.

- Alternative 2 - Roundabout/One-Way Pair Alternative 2 assumes implementation of a modern roundabout at the Stow Lower Village gateway intersection with Pompositticut Road and possibly with Red Acre Road. It also assumes implementation of a one-way pair – essentially an elongated modern roundabout – between the Stow Plaza East and Stow Plaza West entrances on Great Road. Both or either one could be implemented.

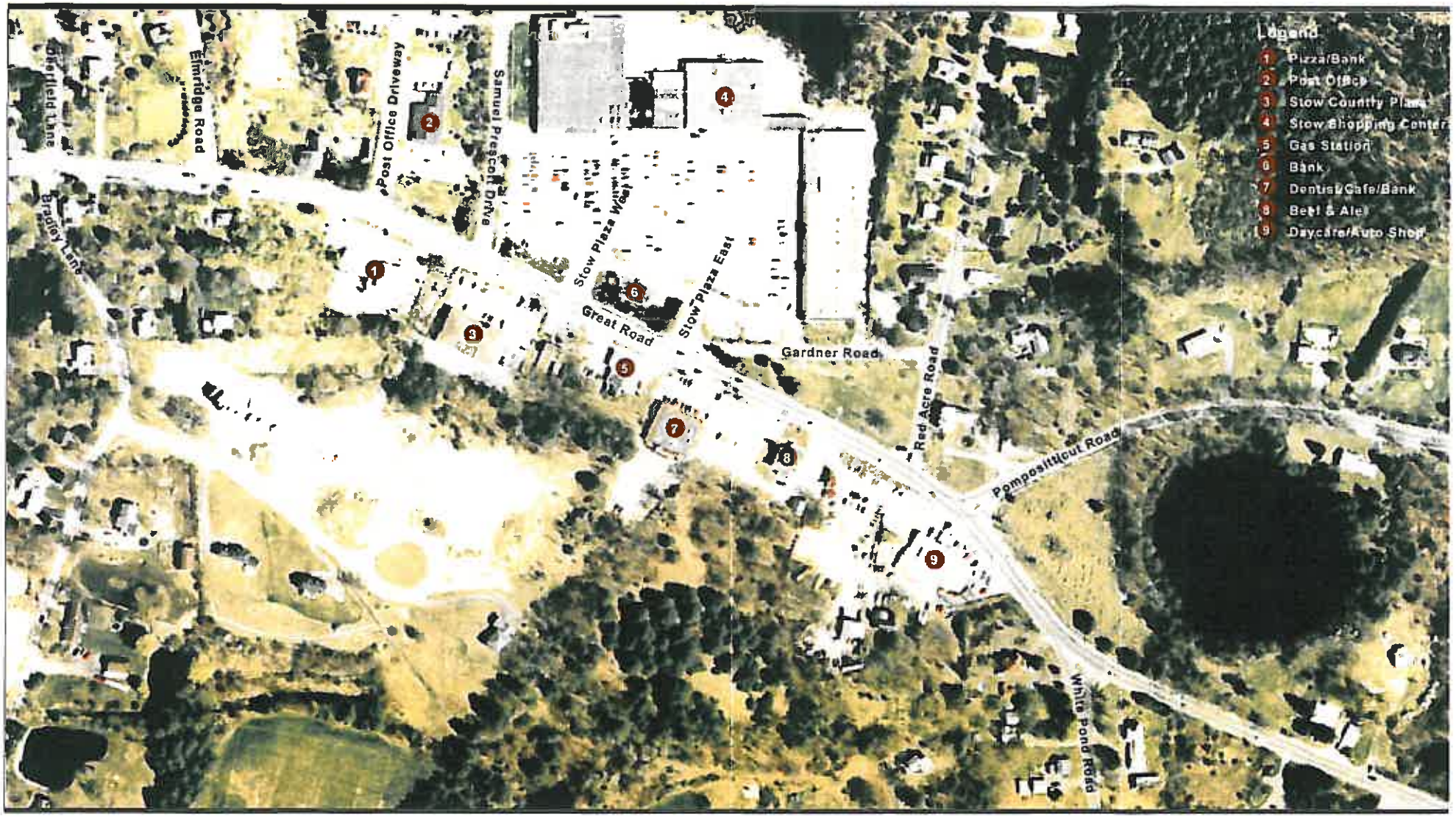
- Alternative 3 – Traffic Signal Control Alternative 3 assumes that the east Stow Plaza driveway and the Pompositticut Road intersection are under traffic signal control. Both or either signal could be implemented. [1]

Overview illustrations of the four alternatives follow as Figures 3-1 to 3-4. Aerial concepts of the roundabout and the enhanced pedestrian crossing movements under Alternative 1 are provided on Figures 3-5 and 3-6.

Figure 3-7 illustrates the typical minimum cross-section needed to incorporate a median in Stow Lower Village at the narrowest right-of-way along the corridor. This was found to be approximately 50 feet from the available plans. However, in order to accommodate the Stow Lower Village Committee recommended sidewalk area cross-section of 11 feet on both sides, it will be necessary to have a right-of-way of 66 feet to achieve a 6-foot wide median with a minimum 16-foot area for a typical 12-foot wide travel lane plus two 2-foot shoulders.

The Technical Appendix attached to this memorandum contains sheets summarizing year 2015 projected traffic volumes for Stow Lower Village and level of service analysis sheets for the No-Build Alternative plus Build Alternatives 1 to 3.

[1] While Alternative 3 shows a traffic signal located at the existing east Stow Plaza driveway, signalizing the relocated Stow Plaza east driveway would produce similar analysis results.



Stow Lower Village Traffic Study
Town of Stow, Massachusetts

No-Build Alternative

Figure 3-1

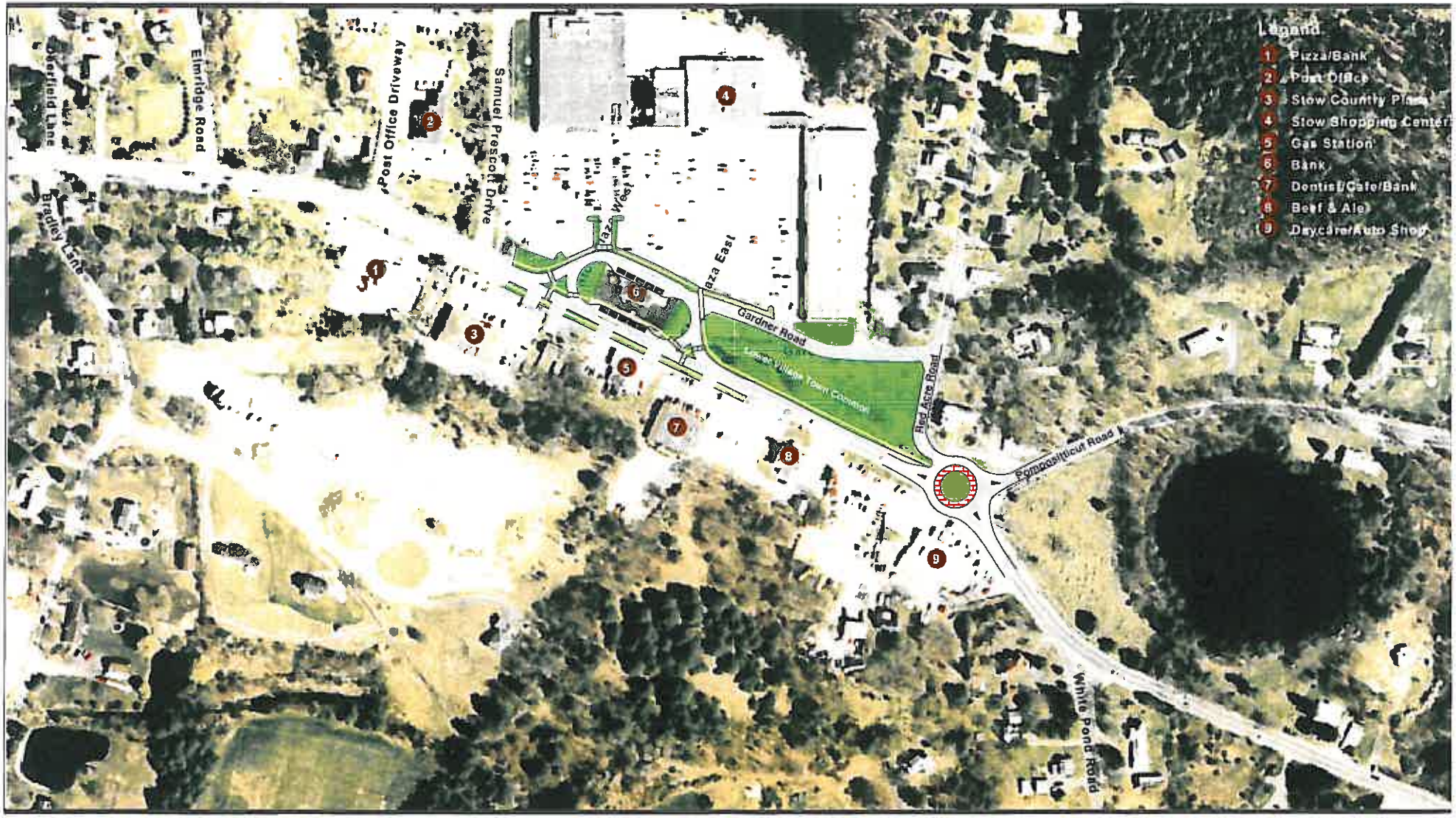
Schematic Diagram,
Not to Scale

Alternative 1 – Sidewalk, Curb Cut Consolidations and Crossing Enhancements

Figure 3-2

Stow Lower Village Traffic Study
Town of Stow, Massachusetts

Schematic Diagram.
Not to Scale



Stow Lower Village Traffic Study
Town of Stow, Massachusetts

Alternative 2 – Roundabout/One-Way Pair
Figure 3-3

Schematic Diagram.
Not to Scale

Alternative 3 – Traffic Signal Control
Figure 3-4

Stow Lower Village Traffic Study
Town of Stow, Massachusetts

Schematic Diagram.
Not to Scale

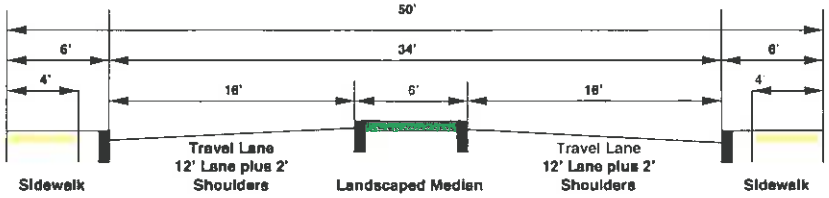
Stow Lower Village Traffic Study
Town of Stow, Massachusetts

Roundabout Concept - Pompositticut Road at Great Road Aerial View

Figure 3-5

Enhanced Pedestrian Crossing – Elmridge Road at Great Road Aerial View
Figure 3-6

Looking East on Great Road (Route 117) at White Pond Road



Minimum Typical Median Section
Existing Right-of-Way
Great Road (Route 117) East of White Pond Road

Not to Scale

3.0 ALTERNATIVES EVALUATION

A comparison of projected traffic operations with the No-Build Alternative and the three Build Alternatives are summarized on Table 3-1 at the end of this section.

NO-BUILD ALTERNATIVE

The No-build Alternative, illustrated previously on Figure 3-1, assumes no substantive changes are made to the local transportation infrastructure – including changes in street layout, signage and pedestrian amenities - and that commercial and residential growth proceeds within the confines of the existing zoning laws at a gradual background traffic growth rate of approximately 1% percent of annual traffic growth. Traffic volumes associated with approved and potential future development projects in Stow and Stow Lower Villlage expected to be constructed and operational by 2015 have been included. From the **Introduction** to this memo, this produces a composite background traffic growth rate of just under 2% per year. The No-Build Alternative also assumes current maintenance standards will be consistently employed and that infrastructure will be maintained in its current condition.

With the No-build Alternative, increases in traffic flow will, by the year 2015, increase delays and queuing at almost every intersection in the study area during the morning and afternoon peak hours. Both morning and afternoon delays will be longer than one minute in multiple locations. Afternoon delays will be excessively long at the entrances to Stow Plaza, averaging four to six minutes at the Stow Plaza east and west driveway intersections with Great Road. Long queues can be expected to form on Pompositticut Road, Stow Plaza East Drive, Red Acre Road and Great Road. It is reasonable to assume that these worsened traffic conditions will have a negative ripple effect on other factors, including pedestrian safety, the usability of the Town Common, air and noise pollution and the preservation of the village character.

Positive Features

- Is better for through traffic than any of the Build alternatives.
- Has the lowest cost of any alternatives (routine maintenance).
- Has no effect on historical resources in Stow Lower Village.

Negative Features

- Provides the worst levels of service at Stow Lower Village intersections of the alternatives considered.
- Does not address the critical congested traffic operations at Pompositticut Road and Red Acre Road and the Stow Plaza driveways.
- Does not address queuing on the side street approaches to Great Road.
- Does not encourage increased pedestrian activity in Stow Lower Village.
- Does not address the Gardner Street five-legged intersection with Great Road and the Stow Plaza east driveway.
- Does not address the safety and traffic operational problems associated with frequent and wide open curb cuts in Stow Lower Village

ALTERNATIVE 1 - SIDEWALK, CURB CUT CONSOLIDATIONS, AND CROSSING ENHANCEMENTS

DESCRIPTION

Alternative 1, illustrated previously on Figure 3-2, proposes the design and installation of multiple features aimed at improving the pedestrian environment in Stow Lower Village, including a consistent, continuous sidewalk system, regularly spaced crosswalks, selected median locations and reduced curb cuts. The Alternative 1 features are essentially minor updates of the year 2002 'Cecil Group Plan'. The reduction of curb cuts will require the creation of joint liability agreements between adjacent landowners who are affected by the proposed curb cut reductions. Curb cut eliminations and consolidations will only be implemented if affected landowners agree to the proposed consolidations and the terms under which the consolidated curb cuts are created -- typically this occurs when one or both adjacent landowners require a site plan review.

Alternative 1 assumes that the Stow Plaza east driveway would be relocated easterly to align with the furthest parking aisle to the immediate west of the Stow Plaza shops. In total five (5) medians approximately 50 to 75 feet in length by 6 feet wide would be constructed around five crosswalks. It is assumed that the Town would landscape the medians seasonally. Alternative 1 further assumes that Red Acre Road is converted to one-way northbound operation between Great Road and Gardner Road, thus diverting its normal approach traffic to the Stow Plaza east driveway. The truncated Gardner Road would remain two-way.

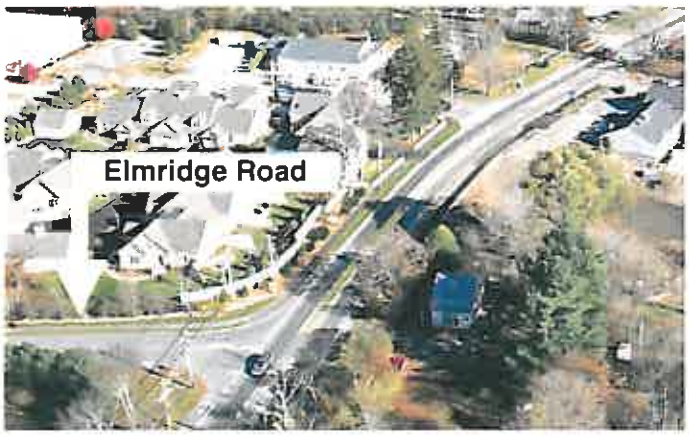
Currently, the sidewalk system in Stow Lower Village consists of a few disconnected segments of paved sidewalk primarily on the north side of Great Road. Alternative 1 assumes that a new sidewalk system will be interconnected and will extend along both sides of Great Road throughout the entire length of the Lower Village district. It further assumes that the Lower Village Committee's recommended typical section for a sidewalk and landscaping with post and granite post and rail fencing is employed to the maximum extent possible. At five locations between White Pond Road and Elmridge Road, the Alternative 1 concept assumes crosswalk visibility and pedestrian crossing safety would be enhanced with 6-foot wide medians. Alternative 1 also assumes that pedestrian-scale street lighting enhancements will be made throughout Stow Lower Village and that Gardner Road will be relocated to eliminate its five-legged intersection at Great Road with the Stow Plaza east driveway.

Stow Village East Gateway Concept

Relocation of Gardner Road under Alternative 1 will enlarge the historic Town Common, but split it at a relocated Stow Plaza east driveway lined up further east with the east-most parking aisle in front of Stow Plaza.

Existing crosswalks at Samuel Prescott Drive and Great Road and the entrance from Great Road to the Post Office are retained in their approximate locations. Approaching Lower Village from the east, Alternative 1 assumes the construction of a median to assist with pedestrian crossings on the periphery of Lower Village at the segment of Great Road just east of White Pond Road. This could be a landscaped island with seasonal flowers, etc. It is assumed the median will be a minimum of six feet wide with a crosswalk that could be delineated through pavement undulation – essentially a slightly raised elevation of the pavement that would increase the visibility of the crosswalk for motorists from both directions without creating a 'speed hump' or 'speed bump', but merely provide a more pronounced visual cue of the pedestrian crossing in the vicinity of the steps to the historic Stow Cemetery. It should be designed such that vehicles (including a high percentage of trucks) traveling along the corridor would be able to maintain the prevailing speed limit through the study area without jostling or added roadway noise.

Another median gateway would be created to signify the approach to Stow Lower Village from the west. Again, the proposed crosswalk would be created similar in concept to the median at White Pond Road, with a pavement undulation located in the middle of the median. It is assumed the median and crosswalk will be situated and designed in a manner to allow a driveway crossing between the Eldridge Road housing area and a residence located on the south side of Great Road. The crosswalk would ideally be located at a point where both motorist and pedestrian visibility is maximized in both directions.



Three additional medians would be constructed in the middle of the two gateway medians between Stow Plaza and Samuel Prescott Road, as indicated on Figure 3-2. The first would be located east of the relocated Stow Plaza east driveway; the second just east of the Stow Plaza west driveway; and the third at an existing pedestrian crossing west of Samuel Prescott Drive. The latter median is feasible because left turn movements at this intersection are and, are expected to remain, relatively light for the foreseeable future. Generally, medians would be designed to minimize interference with turning movements into or out of adjacent driveways and roadways.

The flexible nature of these types of improvements also allows them to be combined with other options that are better able to address vehicular traffic issues. Both the Alternative 2 - Roundabout/One-way Pair and Alternative 3 - Traffic Signal Control assume similar treatments to those proposed in the Curb Cut Consolidations and Pedestrian Enhancements Alternative; therefore this memorandum only highlights the differences proposed.

EFFECTS

Shown Previously on Figure 3-2, Alternative 1 assumes that medians are provided on Great Road to assist with pedestrian crossings and slow the flow of through traffic. They have been located at points where they will not greatly degrade traffic operations. The medians would

provide distinct gateways to Stow Lower Village. Alternative 1 also assumes that the Stow Lower Village Committee's recommended sidewalk treatments are provided to the maximum extent possible and that street lighting enhancements will be made throughout Stow Lower Village.

Positive Features

- Creates an enhanced pedestrian environment.
- Reduces curb cut conflict points.
- Reduces congestion at the Red Acre Road intersection with Great Road through the diversion of its traffic to the Stow Plaza east driveway.
- Retains the historic Town Common and Town land between Pompositticut Road and Red Acre Road.
- Enlarges the Town Common area.
- Is better for through traffic than the other two build alternatives.

Negative Features

- Of the three build alternatives, provides the worst levels of service at Stow Lower Village intersections.
- Does not address the critical congested peak period operations at Pompositticut Road and Red Acre Road and the Stow Plaza driveways.
- Does not address queuing on the approaches to Great Road.
- Adds to congestion of the relocated Stow Plaza east driveway due to the addition of Red Acre Road approach traffic to its volume via Gardner Road.
- Divides the enlarged Town Common with the relocation of the Stow Plaza east driveway.

ALTERNATIVE 2 - ROUNDABOUT/ONE-WAY PAIR

Alternative 2, as shown previously on Figure 3-3, retains the corridor-wide modifications associated with Alternative 1, but focuses on modifying traffic operations at two intersections – the intersection of Pompositticut Road with Great Road and Red Acre Road and the Stow Plaza frontage at Great Road.

The Roundabout/One-way Pair proposes creating a 120-ft diameter modern roundabout at the intersection of Pompositticut Road and Great Road with the Red Acre Road approach and the driveway for the Erkinnon parcel incorporated into its geometry. Yield signs would regulate traffic on all approaches. Red Acre Road approach traffic, similar to Alternative 1, will be removed from the roundabout at the farm site, and diverted via Gardner Road through Stow Plaza. Traffic traveling northbound on Red Acre Road from Great Road will not be affected. Stow Plaza would need to allow Red Acre Road traffic to pass through it via Stow Plaza east or west driveways. In addition to slowing down traffic, the island at the center could be used as a location for a visual cue to the entrance of the Stow Lower Village area.

The second major feature of this option is a one-way pair configuration where the main entrances to Stow Plaza are currently located. The one-way pair would function in much the same way as the roundabout, splitting the travel directions of Great Road in front of the Plaza into two one-way streets with traffic traveling in one direction around an elongated roundabout shape, which would encircle the bank in front of Stow Plaza.

This alternative may improve traffic flow along both Great Road and side streets by minimizing queues created by cars waiting to makes left or right turning movements. It is intended to slow down traffic on Great Road and increase the number of acceptable gaps between cars, thus allowing more opportunities both for traffic to enter on to the main corridor from side streets and for traffic turning off the corridor onto side streets and parking lots. Although the morning and afternoon peak hours still experience queuing and delays, this option has a consistent impact on slowing traffic through Stow Lower Village for the majority of the day.

Because the roundabout signage generally consists of yield signs, roundabouts tend to slow down traffic without having to stop it completely. This typically increases the efficiency of traffic merges and tends to reduce the severity of traffic accidents relative to those that occur at traffic signals.

The more continuous flow of traffic also reduces long queuing times, and thus minimizes impacts to air quality caused by emissions from idling vehicles. Aesthetically, if handled in the right way, a one-way elongated roundabout through Stow Plaza could also enhance the Village's character by providing new landscaping opportunities.

However, the complexity and the dramatic change in street geometry necessitated by this alternative, particularly the one-way pair, pose some difficulties. Because the one-way pair takes up a large amount of area and affects the bank drive through operation, some land takings would be necessary. Additionally, while the roundabout does create a green space at its center, it would not be accessible by pedestrians. Although crosswalks will be included at the entries to the roundabout, it will not be a particularly pedestrian friendly environment because there are many sources feeding traffic into it and will therefore have a relatively high traffic volume. Cost is also a consideration. Estimates for standard 120-ft roundabout range from $250,000 to $350,000. This investment might increase as well: when future growth necessitates yet another updating of traffic infrastructure, the roundabout will have to be widened into two lanes to accommodate the traffic.

Positive Features

- Slows through traffic considerably through Stow Lower Village.
- Creates a significant westbound gateway into Stow Lower Village to augment the proposed median just east of White Pond Road
- Creates significant landscaping opportunities at the Town Common and Stow Plaza areas.
- Addresses the Pompositticut Road approach to Great Road.
- Minimizes queuing during non-peak hours.

Negative Features

- The Stow Plaza one-way treatment requires a land takings and elimination of the drive-through bank lane.
- Peak period congestion will still occur on the roundabout, though it will be less congested throughout the day than alternative traffic signal control.
- Adds to congestion of the relocated Stow Plaza east driveway due to the addition of Red Acre Road approach traffic to its volume via Gardner Road.
- Its impact on the historic character of Stow Lower Village and historic traffic flow pattern raises concerns as the continuity of Great Road would be compromised.

- To be most effective, the one-way treatment through Stow Lower Village requires additional curb cut consolidations beyond those with Alternative 1.
- Is detrimental to through traffic and will be most difficult for Great Road trucks to negotiate through; provides circuitous routing for traffic in the Stow Plaza area.
- Modern roundabouts are not pedestrian-friendly and are not as easy to cross as traffic signal controlled intersections.
- Implementation of both features will be the most costly of build Alternatives considered.

ALTERNATIVE 3 - TRAFFIC SIGNAL CONTROL

Description

Alternative 3 proposes installing actuated signals at the two most congested intersections of Stow Lower Village – the Stow Plaza east driveway and Pompositticut Road intersections with Great Road. Like Alternatives 1 and 2, Alternative 3 assumes that the segment of Red Acre Road between Great Road and Gardner Road is converted to a one-way street segment, headed north. It also assumes that Gardner Road would be rerouted to run parallel to Great Road, thus reducing the Stow Plaza East driveway from a five-legged intersection to a T-shaped geometry. This rerouting would also provide the opportunity to extend and enhance the Lower Village Town Common. Additionally, Alternative 3 assumes on-street parking on Red Acre Road, between Great Road and Gardner Road. We note that while not assumed with Alternatives 1 and 2, it is possible to create on-street parking on one or both sides of Red Acre Road, should the Town desire it for special occasions.

This alternative retains most of the corridor-wide modifications associated with Alternative 1, but focuses on signalizing traffic operations at two intersections – the intersection of Pompositticut Road with Great Road and the Stow Plaza east intersection with Great Road. Unlike Alternative 1, the intersection of Stow Plaza east driveway is not relocated easterly, but Gardner Road is relocated northerly and the Town Common is enlarged and integrated as one continuous green space rather than two split green spaces.

At the Pompositticut Road intersection with Great Road, Alternative 3 assumes the construction of opposing left turn lanes in both directions of Great Road plus an exclusive westbound right turn lane to increase the efficient operation of the intersection. Like Alternative 1, approach traffic that now occurs from Red Acre Road is diverted to Stow Plaza east driveway via Gardner Road; this alternative assumes Gardner Road is relocated north to eliminate the five-legged intersection with Great Road and the Stow Plaza east driveway. The Stow Plaza east driveway is signalized assuming two southbound approach lanes and two approach lanes with opposing left turn lanes in each direction plus a westbound exclusive right turn lane to optimize intersection operations.

Effects

By signalizing these intersections, excessive queuing on side streets would be reduced because the signal provides access opportunities for each signal approach. As a result, there would be improved levels of service at the signalized intersections. Like the pedestrian improvements alternative, this option is flexible in that it can be combined with the other alternatives if desired. It is a lower-cost option than the roundabout, estimated at around $150,000 to $175,000 per signal, including both the installation of the signal and redesigning of the intersections to

accommodate traffic movements. The signal alternative does not require land-takings other than those associated with the relocation Gardner Road that apply to Alternatives 1 and 2. Alternative 3 may present an opportunity to expand the Town Common, thus enhancing its usability by pedestrians. This option also creates the possibility of exclusive pedestrian crossings at the signalized intersections.

There are, however, some negative impacts associated with the signalized alternative. The signalized intersections will result in the greatest delays to though traffic compared to the No-Build or Alternatives 1 and 2. Level of service, queuing and delays in some instances, delays may be worsened due to queue blockages of nearby unsignalized intersections. Additionally, signalization in some cases can cause an increase in rear end crashes. Traffic signals may not be consistent with Stow Lower Village aesthetics. Consequently, the design of the traffic signals, if conceptually agreeable to the Town of Stow, must be carefully considered in order to maintain and enhance the character of the Lower Village.

Positive Features

- Stow Plaza east and Pompositticut Road approach traffic is able to access Great Road more easily than with the No-Build alternative or with Alternatives 1 and 2, particularly during peak hours.
- Creates significant landscaping opportunities at the Town Common and Stow Plaza areas.
- Provides pedestrians with an easier crossing of Great Road at the signalized intersections.
- Creates gaps for traffic on side streets.

Negative Features

- The Stow Plaza right turn lane would need to be taken from the Town Common.
- Through traffic impacts are most severe, as Great Road queuing will be more significant than with the other alternatives.
- Widening is required at Pompositticut Road and Stow Plaza East to accommodate turning movements on the signal approaches.
- Its impact on the historic character of Stow Lower Village raises concerns.
- To be most effective, the one-way treatment through Stow Lower Village requires additional curb cut consolidations beyond those with Alternative 1.
- Is detrimental to through traffic and will be most difficult for Great Road trucks to negotiate through; provides circuitous routing for traffic in the Stow Plaza area.
- Signals are not rural in character and may cause an increase in rear-end vehicle crashes.

Table 3-1: Level of Service Criteria[1]

Unsignalized Intersections	
Level of Service	**Average Delay per Vehicle (sec/veh)[2]**
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	>35 and ≤ 50
F	> 50

Signalized Intersections	
Level of Service	**Average Delay per Vehicle (sec/veh)[2]**
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	>55 and ≤ 80
F	> 80

[1] *Highway Capacity Manual* (HCM2000), Transportation Research Board
[2] Seconds per vehicle of control delay including stop delays plus decelerating and accelerating delay compared to free flow.

Table 3-2 - Stow Lower Village - Year 2015 Traffic Analysis Comparison Summary

Intersection	No-Build AM				Alternative 1- Enhancements AM				Alternative 2 - Roundabout/1-way AM				Alternative 3 - Signal AM			
	LOS	Average Delay worst approach	Queuing	ICU	LOS	Average Delay	Queuing	ICU	LOS	Average Delay	Queuing	ICU	LOS	Average Delay	Queuing	ICU
2 Great Road and Post Office Drive	B	14	2	72%	B	14	2	72%	B	14	2	72%	B	14	2	72%
4 Great Road and White Pond Road	E	38	26	62%	E	38	26	62%	E	38	26	62%	F	100	26	62%
7 Great Road and Deerfield Lane	F	77	45	80%	F	77	45	80%	F	77	45	80%	F	77	45	80%
9 Great Road and Elmridge Road	E	37	13	79%	E	37	13	79%	E	37	13	79%	F	52	19	79%
12 Great Road and Samuel Prescott Drive	F	55	32	77%	F	55	33	77%	F	55	33	77%	F	97	51	86%
15 Great Road and Stow Plaza West Drive	F	91	67	82%	F	91	67	82%	F	100+	449	91%	C	23	12	75%
16 Great Road and Stow Plaza East Drive	F	100+	176	80%	F	100+	329	83%	D	26	14	76%	C	22	*1536*	83%
19 Great Road and Red Acre Road	F	100+	198	105%	A	3	3	98%	N/A				B	10	4	71%
20 Great Road and Pompositticut	F	100+	221	119%	F	100+	221	119%	V/C = 1.13 (congestion expected)				C	27	*869*	71%
23 Great Road and East Bank Plaza	F	63	2	79%	F	63	2	79%	F	58	2	77%	F	100+	13	79%
26 Great Road and Pizza Bank	F	53	34	79%	F	53	34	79%	E	45	30	79%	F	79	47	79%
28 Great Road and Country Plaza Drive	E	44	4	78%	E	44	4	78%	E	44	4	78%	F	80	5	78%
35 Great Road West and Stow Plaza West Drive									F	60	143	56%				
36 Great Road West and Stow Plaza East Drive									C	22		52%				

Intersection	No-Build PM				Alternative 1- Enhancements PM				Alternative 2 - Roundabout/1-way PM				Alternative 3 - Signal PM			
	LOS	Average Delay	Queuing	ICU	LOS	Average Delay	Queuing	ICU	LOS	Average Delay	Queuing	ICU	LOS	Average Delay	Queuing	ICU
2 Great Road and Post Office Drive	F	100+	187	91%	F	100+	187	91%	F	100+	187	91%	F	100+	187	91%
4 Great Road and White Pond Road	F	65	33	75%	F	65	33	75%	F	65	33	75%	F	83	40	75%
7 Great Road and Deerfield Lane	F	100+	77	97%	F	100+	77	97%	F	100+	77	97%	F	100+	77	97%
9 Great Road and Elmridge Road	F	100+	34	89%	F	100+	34	89%	F	100+	34	89%	F	100+	72	89%
12 Great Road and Samuel Prescott Drive	F	91	66	89%	F	91	66	89%	F	91	66	89%	F	100+	99	89%
15 Great Road and Stow Plaza West Drive	F	100+	215	97%	F	100+	215	97%	D	34	77	97%	F	100+	N/A	97%
16 Great Road and Stow Plaza East Drive	F	100+	190	98%	F	100+	N/A	98%	F	100+	N/A	110%	*B*	*14*	*713*	89%
19 Great Road and Red Acre Road	F	100+	204	92%	A	4	8	84%	N/A				F	100+	75	84%
20 Great Road and Pompositticut	F	100+	861	142%	F	100+	861	142%	V/C =1.43 (congestion expected)				*D*	*42*	*1958*	96%
23 Great Road and East Bank Plaza	F	100+	52	87%	F	100+	52	87%	F	100+	52	87%	F	100+	N/A	87%
26 Great Road and Pizza Bank	F	100+	5	90%	F	100+	5	90%	F	100+	5	90%	F	100+	N/A	90%
28 Great Road and Country Plaza Drive	F	100+	25	89%	F	100+	25	89%	F	100+	25	89%	F	100+	48	89%
35 Great Road West and Stow Plaza West Drive									F	100+	527	97%				
36 Great Road West and Stow Plaza East Drive									F	100+	306	87%				

LOS - Level of Service A-F (A is best, F is worst)

Average Delay - Average delay - Seconds per vehicle during the peak 15 minute period of the peak hour On the worst approach for unsignalized, average overall for signalized locations (italicized)

Queuing in feet overall in all directions

ICU - Intersection Capacity Utilization This is a summary capacity term given in the SYNCHRO for information only

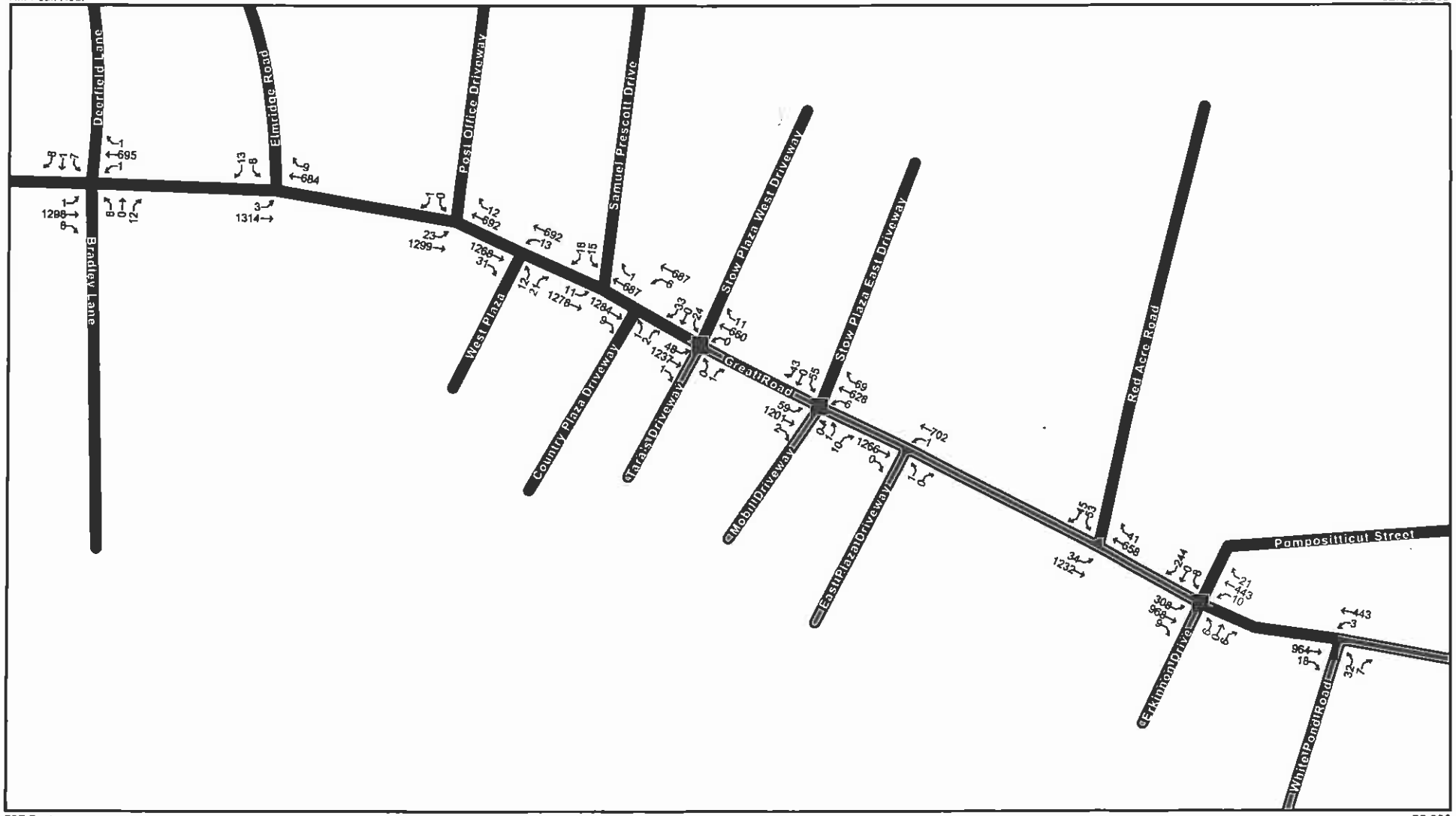
4.0 NEXT STEPS

With the review of the fundamental Stow Lower Village traffic control alternatives available to the Town of Stow, the next step is to formulate a consensus alternative as 'Preferred' for Stow Lower Village. The Committee should carefully consider the pros and cons identified in this memorandum and provide necessary input as to the various features that are most positive – and most negative – from the Town's perspective. Once a 'preferred' vision has been identified by the Town reviewers, FST will provide a technical analysis of the Preferred Alternative and will identify a strategy for its phased implementation.

It is our understanding that the Mobil Station in Stow Lower Village has recently been demolished and that the Town does not yet have a concept plan for the reuse of the Mobil Station site. The reuse of this site provides the Town with a potential opportunity to consolidate curb cuts in the vicinity of the affected parcel and begin the process of realizing the vision of implementing enhancements to the Stow Lower Village pedestrian and vehicle circulation environment.

We look forward to presenting the alternatives evaluation at the upcoming meeting on January 18, 2006.

Technical Appendix 1
2015 Traffic Volume Projections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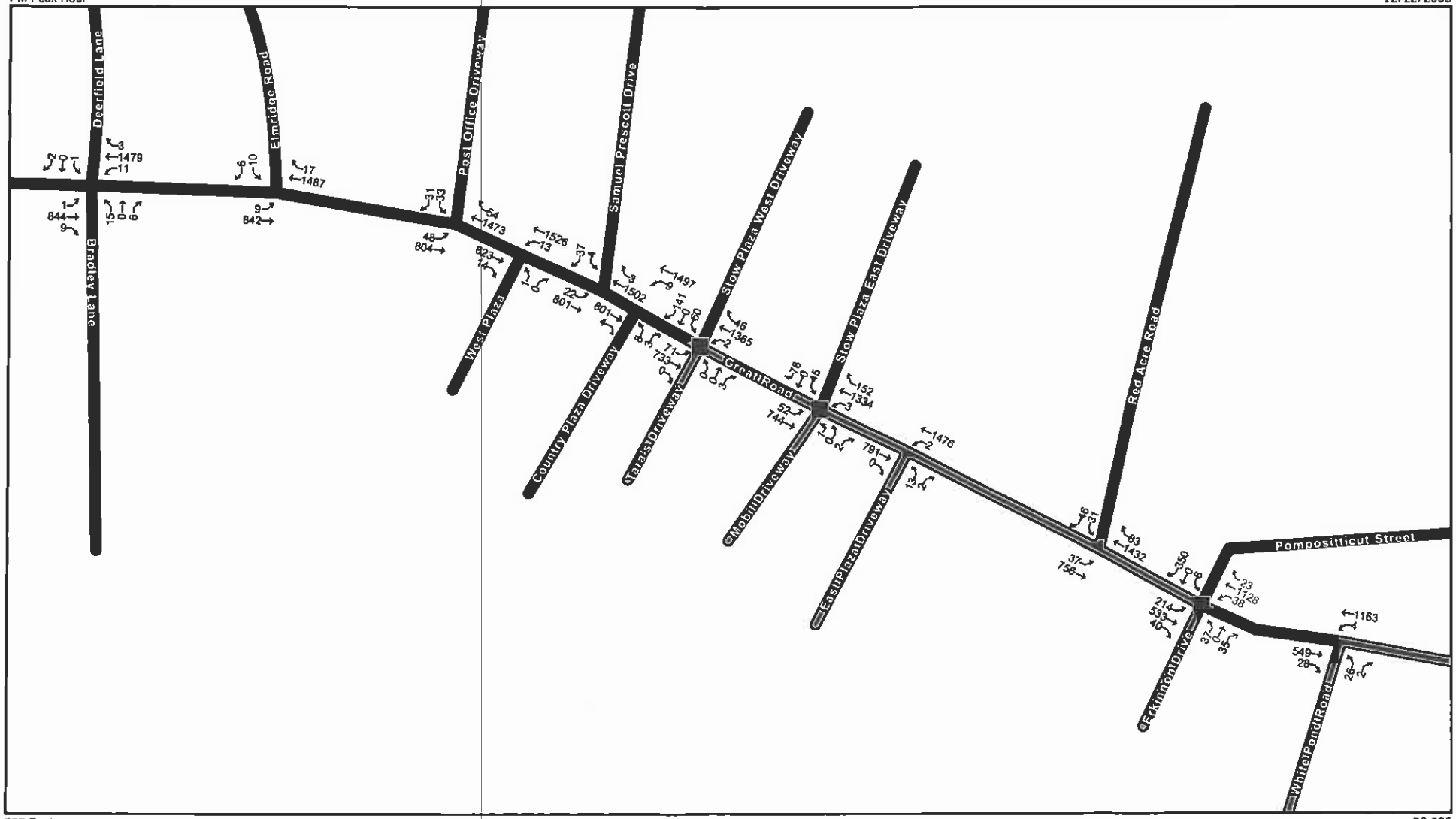
Post Office Driveway
Samuel Prescott Drive
Stow Plaza West Driveway
Stow Plaza East Driveway
Red Acre Road
Bradley Lane
West Plaza
Country Plaza Driveway
Tara's1 Driveway
Great Road
Mobil Driveway
East Plaza Driveway
Pompositticut Street
Erkimont Drive
White Pond Road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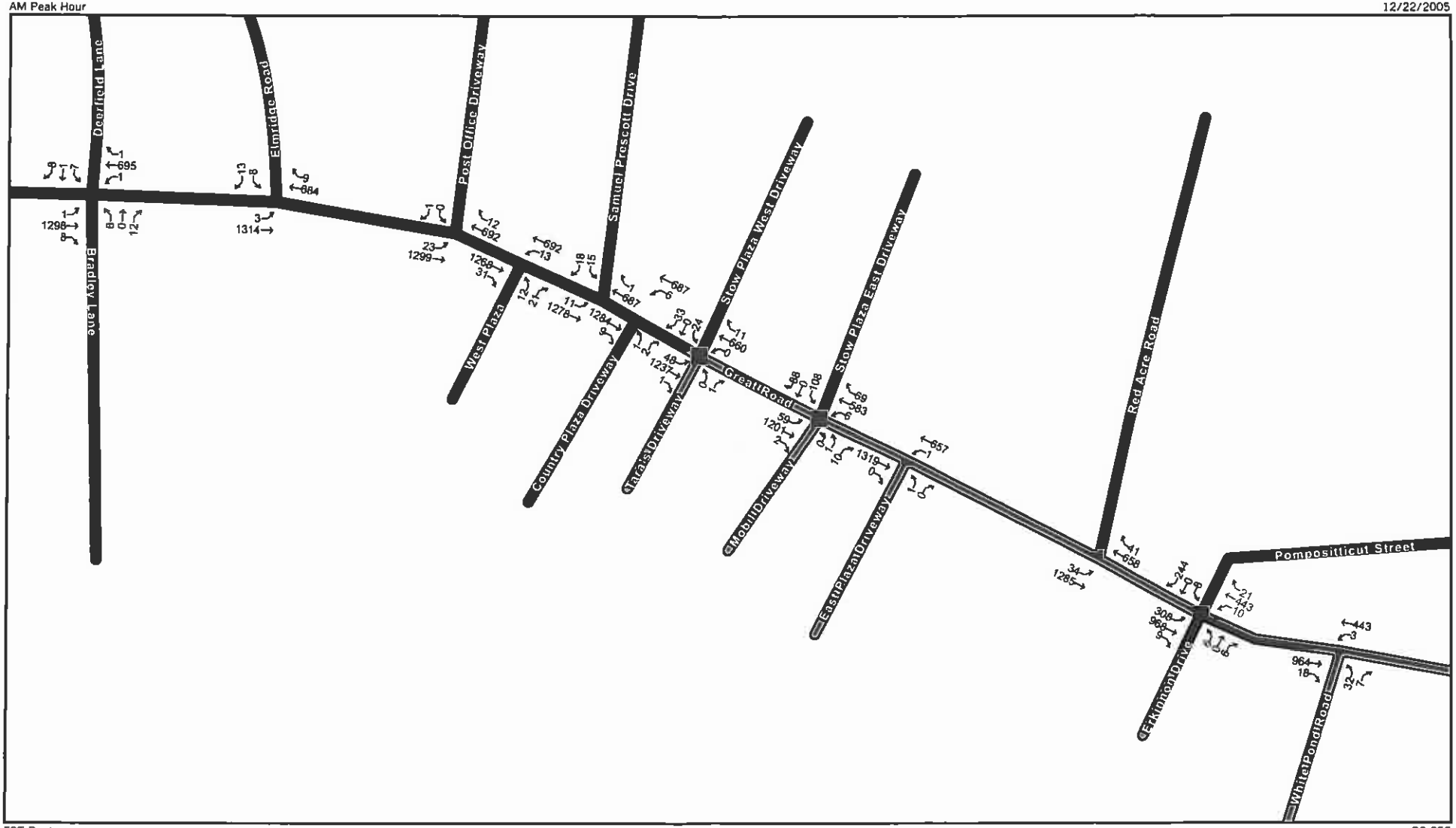
Bradley Lane
West Plaza
Country Plaza Driveway
Great Road
Tara 1st Driveway
Mobil Driveway
East Plaza Driveway
Pompositticut Street
Erkimont Drive
White Pond Road

Alternative 1 System 2015
AM Peak Hour

Stow Lower Village
12/22/2005

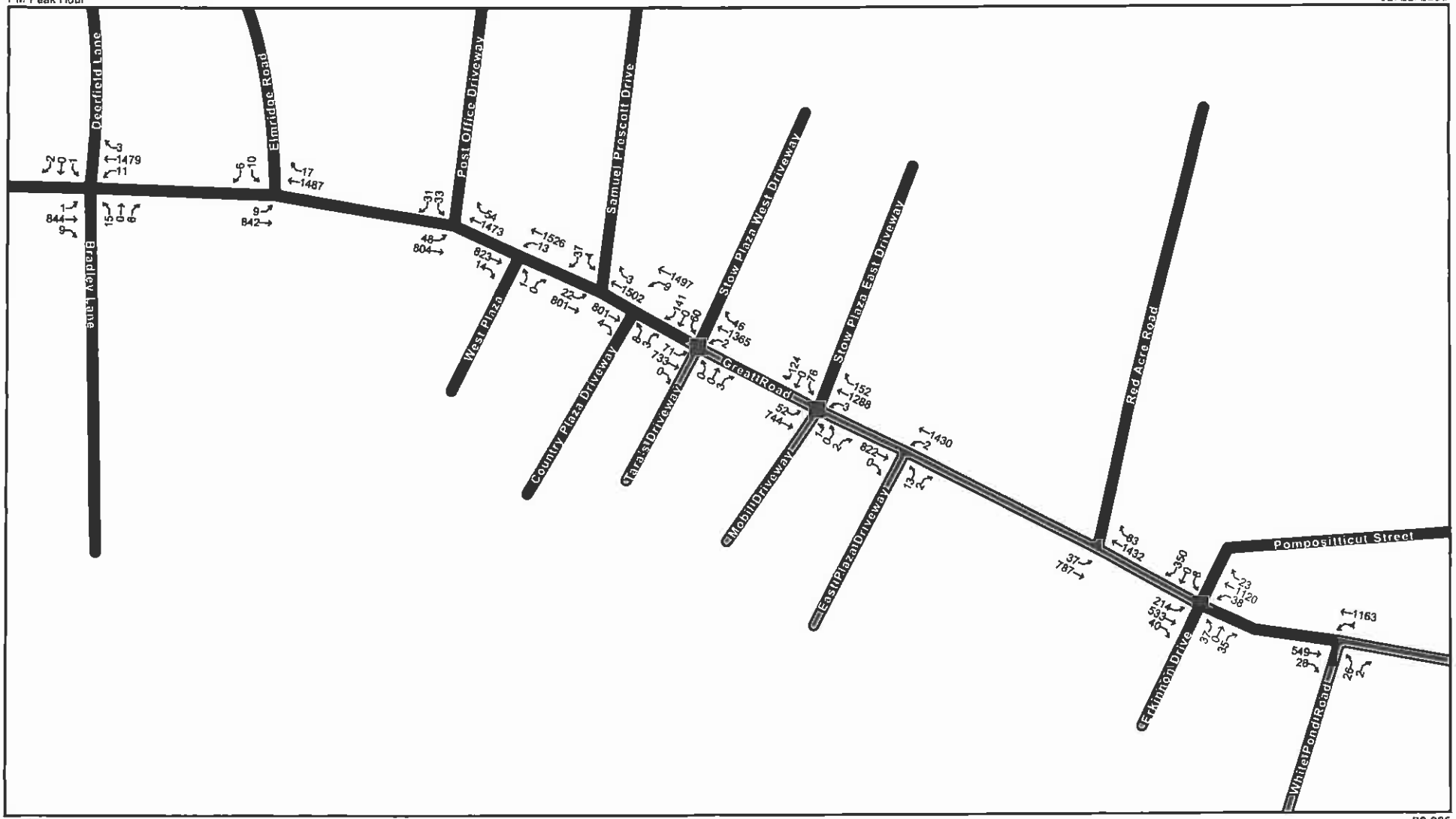


FST Boston
Balanced Volumes

PS-026

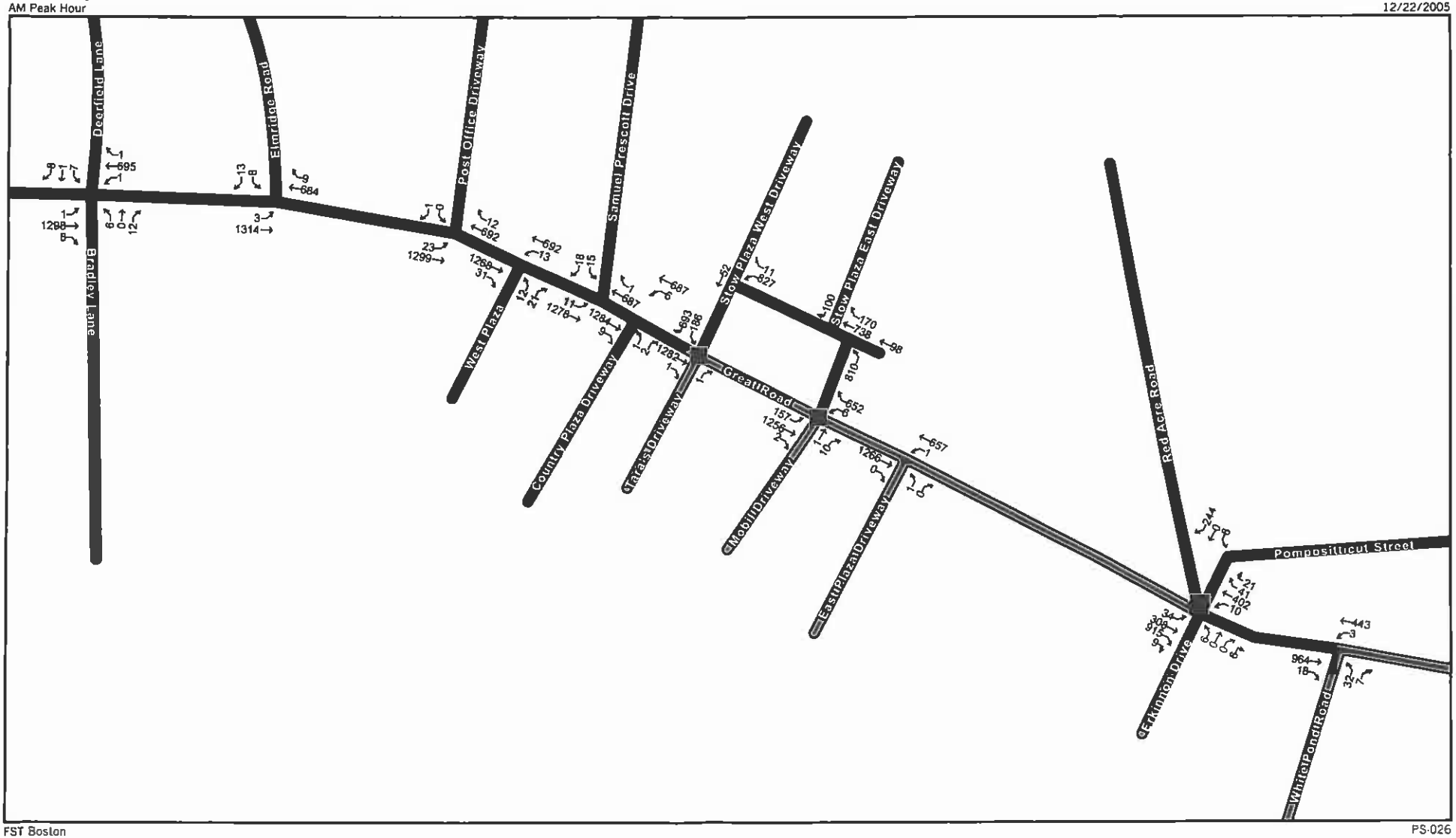
Alternative 1 System 2015
PM Peak Hour

Stow Lower Village
12/22/2005



FST Boston
Balanced Volumes

PS-026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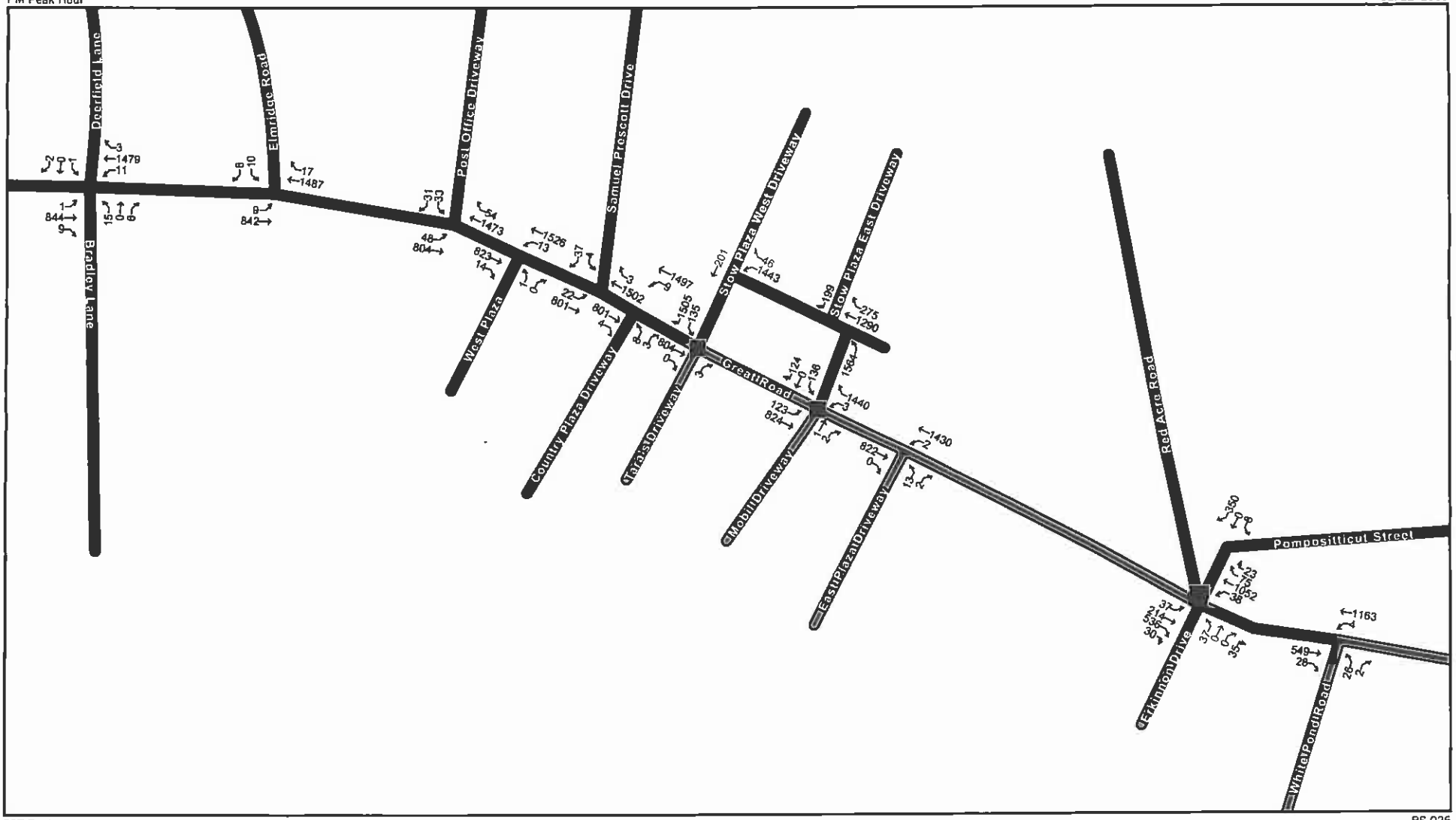
Elmridge Road
Post Office Driveway
Samuel Prescott Drive
Stow Plaza West Driveway
Stow Plaza East Driveway
Red Acre Road
Bradley Lane
West Plaza
Country Plaza Driveway
Tara 1st Driveway
Great Road
Mobil Driveway
East Plaza 1st Driveway
Pompositticut Street
Fr Mahon Drive
White Pond Road

Roundabout System 2015
PM Peak Hour

Stow Lower Village
12/22/2005

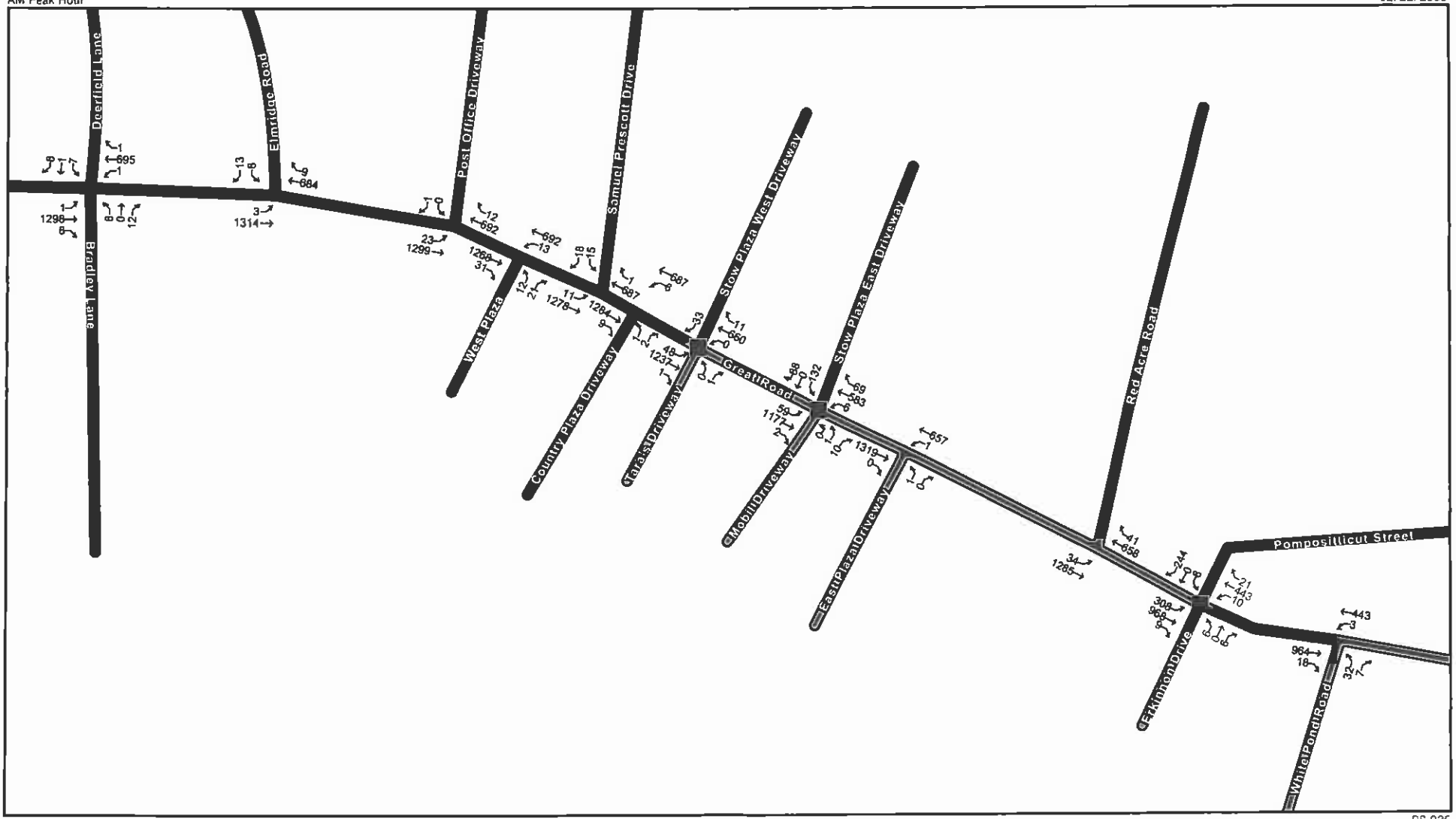


FST Boston
Balanced Volumes

PS-026

Signal System 2015
AM Peak Hour

Stow Lower Village
12/22/2005

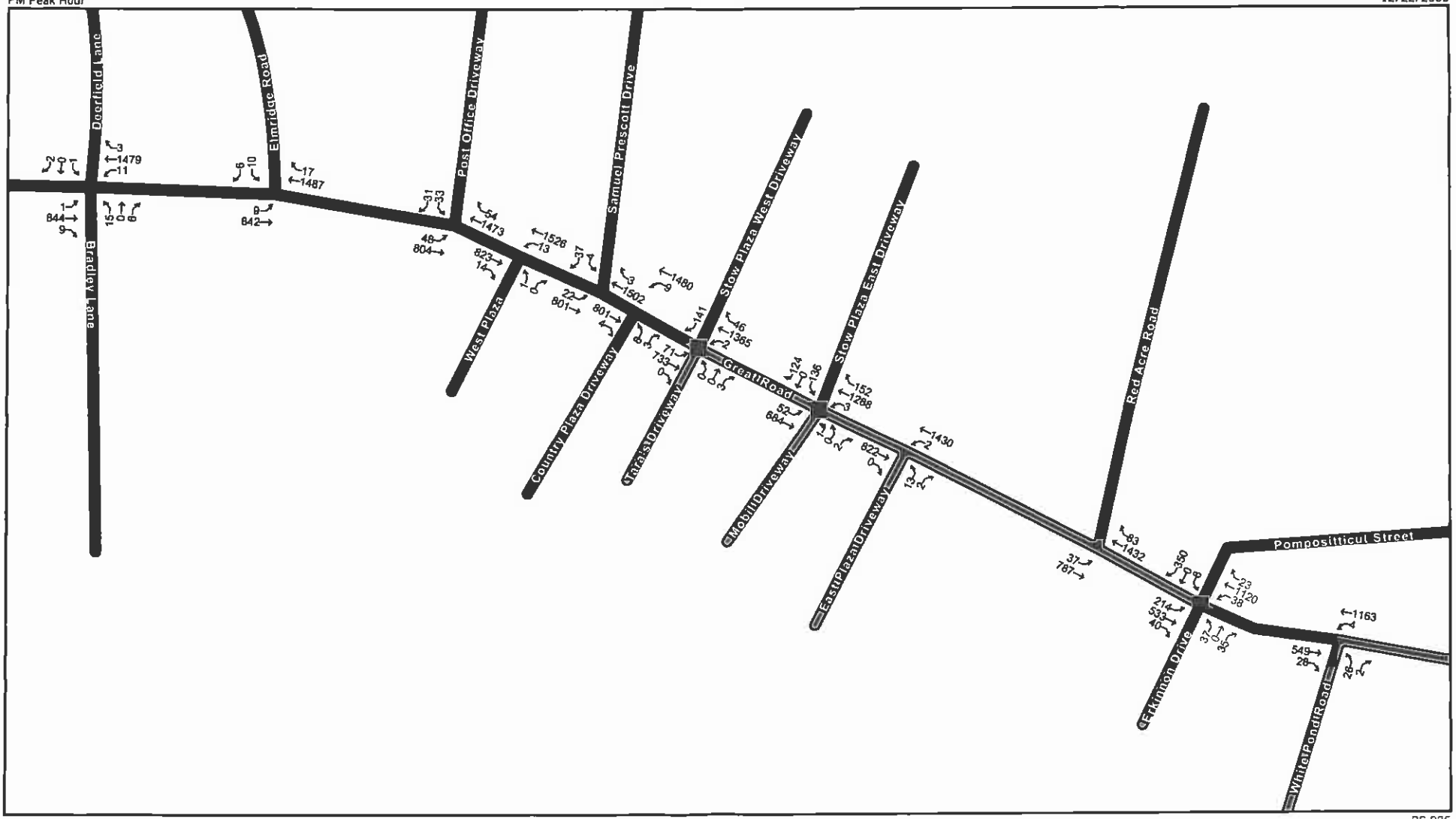


FST Boston
Balanced Volumes

PS-026

Signal System 2015
PM Peak Hour

Slow Lower Village
12/22/2005



FST Boston
Balanced Volumes

PS-026