SUDBURY CENTER
Improvement Plan

FINAL REPORT

Prepared for:

The Sudbury Center Improvement Advisory Committee

Prepared by:

The Cecil Group

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Planning Context

The Sudbury Center Improvement Plan (the plan) has been undertaken by the Town to establish a coherent direction for the treatment of this key district and to focus expenditures on those elements that will best address functional issues at the intersection without damaging the visual character of this historic location.

The plan was developed by a consultant team composed of The Cecil Group, Inc., a professional planning and design firm, SEA Consultants, Inc., transportation planners and PAL, Inc., a historic resources consultant. The plan was developed in cooperation with the Sudbury Center Improvement Advisory Committee (SCIAC / the Committee), a volunteer stakeholder group established to direct the planning process and to provide a liaison with the larger community.

The Final Report summarizes the planning methodology, identifies the historic context of the district, reports on existing site conditions, traffic operations and community-generated goals and objectives and proposes potential design approaches to realizing functional, visual and civic improvements for historic Sudbury Center.

Plan Initiation

During the initial phase of the project, meetings were held with the Committee to establish an approach and schedule for the work and its process for its execution. The consultant team conducted several site visits and collected baseline information on the area such as surveyed plans, aerial photos and assessor's data. Team members conducted interviews with stakeholder groups and town agencies, undertook historic research, collected traffic counts and analyzed data.

Community Visioning Workshop

The team attended a public Visioning Workshop on May 31, 2006 hosted by the Committee to understand the issues, sensitivities, and wishes of the larger community. At the workshop, the team described initial impressions of Sudbury Center's existing conditions and the opportunities the district held as well as constraints that should be addressed. The meeting allowed the community to express its feelings on the priority order of the issues and objectives for the project.

History

The rolling topography above a rich food plain flanking the Sudbury River offered excellent hunting, fishing and gathering opportunities for the native population during the Pre-Contact Period. The area was probably settled by the Nipmucks, an inland rather than a coastal tribe. Diseases brought by the first European explorers decimated the coastal and inland tribes in the early Seventeenth Century and eliminated whole native settlements allowing English immigrants to establish farms on prime agricultural land. The earliest farms during this period were sited on well-drained terraces overlooking the river flood plain with some limited settlement on the rocky upland areas. Farming was a subsistence operation with limited local exports of farm products and lumber to East Sudbury – now called Wayland. Trails cut by the native population became early roads, but poor access and fear of the native population constrained the rate of settlement.

In April of 1676, farms in the area were attacked and burned by native raiding parties during King Philip's War. Even with the conclusion of this conflict, settlement expanded only slowly. After 1720, the radial road pattern evident today in Sudbury Center was established and an estimated 500 people lived in Sudbury by the time of the American Revolution. The Town Hall was built on land owned by First Parish of Sudbury on the west side of Concord Road in 1845 and the Grange Hall was built in 1846. Farm products continued to be consumed locally until transportation in the area improved with the arrival of the railroad in 1871.

With the construction of the Old Colony Railroad connecting Concord to Framingham through Sudbury, the opportunity to ship agricultural products to the markets of Boston, Worcester and Concord was created. Sudbury's population did not increase markedly during this period, but some consolidation of small homesteads into larger farms occurred. Some of this consolidation took the form of small country estates established by wealthy Bostonians near Sudbury Center.

In the Early Modern Period (1915 – 1940), colonial roads were upgraded to accommodate motor vehicles, market farming continued to increase in economic value and the number of residents began to increase during the 1930's. Town Hall was destroyed by fire in 1929 and was rebuilt in its current location (1932).

The completion of Route 128 in 1951 and the Massachusetts Turnpike in 1965, increased automobile ownership, combined with FHA mortgages, accelerated the rate of suburbanization after World War II. As farmland began to be converted to residential subdivisions, Sudbury's population rose sharply – 1,750 residents in 1940; 7,500 residents in 1960 and 17,160 residents in 2004.

Archeological / Historical Resources in Sudbury Center

Predictive Statement: Pre-Contact Period Cultural Resources

The results of background research indicate that the Sudbury Center project area is located outside a core area of Native American settlement that was oriented to the Sudbury River. Based on a preliminary records search including a review of Massachusetts Historical Commission files, there are no known pre-contact period Native American archaeological sites in the Sudbury Center district. The largest concentrations of known archaeological sites are located in a core area of Native American settlement along the Sudbury River and its extensive marshes/river meadows in Great Meadows National Wildlife Refuge about 1 ½ miles east of Sudbury Center. The archaeological sites in this core area span over 8000 years and range in age from the Early Archaic to Late Woodland period.

There are unconfirmed reports of pre-contact period Native American artifacts being found within a crawl space beneath the First Parish of Sudbury and near the horse sheds. Two Native American graves are alleged to be in Mt Pleasant cemetery. These reports will need to be researched further during later project phases through informant interviews.

An environmental setting like that present in the Sudbury Center district could contain isolated pieces of pre-contact period Native American cultural material like chipping debris from making a stone tool or a few chipped stone tools (projectile points, bifacial tool blades) used during hunting, trapping and other resource collection tasks. These artifacts would most likely occur on well-drained soils near the margins of wooded wetlands or small seasonal streams. There has been a long history of landscape modification during the historic/modern period that could have removed or altered any pre-contact period Native American archaeological sites. For example, the Heritage Park constructed south of the town common and Old Sudbury Road (Route 27) in the mid 1970s modified an area along the borders of a red maple swamp that could have contained the type of small, low visibility Native American archaeological resources described above.

In general, the district would be ranked as having low to moderate sensitivity for Native American archaeological sites. Based on the results of background research, the project area has limited potential to contain other, previously unknown Native American archaeological sites. Most of the project area displays extensive evidence of previous disturbance. The few remaining intact sections of the project area have soils that are not well-drained or steep slopes and it is unlikely that any Native American archaeological sites are present in the project area. No zones of high sensitivity for pre-contact period Native American cultural resources were noted within the project area. A few small zones of moderate archaeological sensitivity were noted in the northern end of the project area (First Parish of Sudbury lawn) and near the intersection of Goodman's Hill Road and Concord Road.

The stratification of the Sudbury Center district into zones of sensitivity for pre - contact period Native American archaeological resources is shown in Figure 1.

Figure 1: PAL Precontact Sensitivity Zone

Predictive Statement: Post-Contact Period Cultural Resources

Based on both background research and a walkover inspection, several parts of the Sudbury Center district project area have the potential to contain subsurface archaeological components associated either with current standing structures or buildings that once stood in the district.

In the center of the district, the open lawn of the First Parish of Sudbury property may contain the most intact soil horizons with minimal alteration from landscaping or grading. The lawn could contain archaeological deposits associated with the construction and removal of an earlier 18th century meetinghouse or the construction of the existing building (ca 1797). The former location of the original 1847 Town Hall at the east end of the First Parish of Sudbury horse sheds may contain remnants of the foundation or footing for this mid nineteenth century structure.

There is some potential for archaeological remains of public facilities that once stood on the Town Common (SUD HA 19). The open common central to the Sudbury Center district once contained a district school and band stand in the nineteenth to early 20th century. Shallow footings for these structures may survive within the present common. A granite horse-watering trough and hay scale were also situated on the common in the late 19th to early 20th centuries. A footing or other remains such as wood, ceramic or cast iron pipe that carried water to the trough may survive. The existing town common has apparently been subjected to episodes of landscaping and the survival potential of any archaeological component will depend on the depth and extent of alteration caused by this activity.

The sloping lawn in front of the Loring Parsonage and small portions of the Hosmer House lot (yard areas) may also contain relatively intact subsoils with archeological deposits (domestic refuse) associated with the 18th and 19th century occupancy of these historic standing structures.

The small patch of open lawn in the Grinnell Park parcel on the western side of the Old Sudbury Road (Route 27)/Concord Road intersection also has the potential to contain archaeological components. A foundation or footing associated with the 19th century Parmenter/Garfeld Store and an attached barn or shed may survive in Grinnell Park depending on the extent of previous grading, filling or other alteration. The two historic properties (Sawin and Bent houses on 1889 map) located west of the First Parish of Sudbury consist of standing structures with surrounding yard areas that appear to have remained intact. The front yard areas of these two lots bordering Hudson Road have the potential to contain archaeological deposits associated with 18th and 19th century occupancy of these houses.

In the southern portion of the Sudbury Center district, near the intersection of Goodman's Hill Road and Concord Road, the former location of the 1839 Sudbury Evangelical Church/Music Hall (SUD HA 11) is now occupied by a house (former Morse residence). The former Jonas Tower Blacksmith Shop (SUD HA 18) site is also occupied by an existing house at 285 Concord Road (former Spiller property in 1959). It is unlikely that any archaeological evidence of these two structures (Evangelical Church/Music Hall, Tower Blacksmith Shop) has survived.

At the northern end of the Sudbury center district, the fieldstone foundation for the Mary B. Hunt House (SUD HA 32) formerly located on the north side of Concord Road just outside New Town Cemetery is an important archaeological resource, but has been somewhat compromised and buried per Massachusetts Historical Commission approval.

The stratification of the Sudbury Center district into zones of sensitivity for historic/modern period archaeological resources is shown in Figure 2.

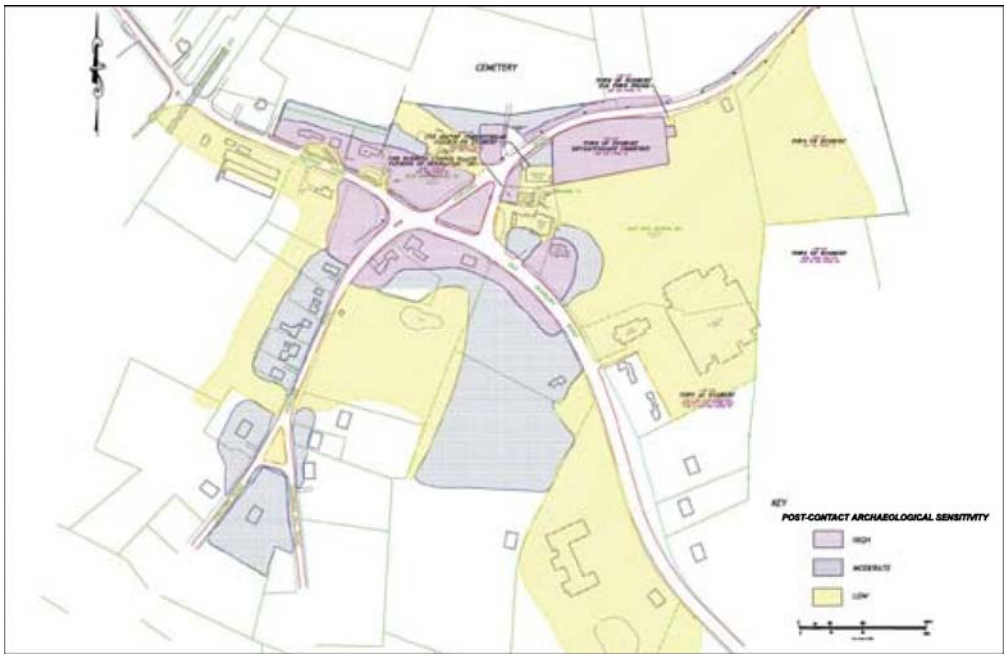


Figure 2: Post Contact Cult Resources

Summary and Recommendations

The archaeological sensitivity assessment determined that most of the Sudbury Center district project area consists of modified land that has contained a mix of residential, commercial and civic structures since the early eighteenth century. The construction and demolition or removal of these buildings and other facilities likely resulted in varying degrees of alteration to the original topography. However, there are parts of the project area with some probability to contain archaeological deposits associated with either pre-contact period Native American or post - contact/historic period cultural resources.

Further archaeological investigation of the Sudbury Center Improvement project area may be needed depending on final design of proposed changes to the intersection of Concord and Hudson/Old Sudbury Roads (Route 27). If any zones of high to moderate archaeological sensitivity will be affected by the proposed improvements, then these portions of the project area should be subjected to an intensive (locational) archaeological survey.

Any disturbance to the Revolutionary War Cemetery and family tombs bordering both the north and south sides of Concord Road in the northern portion of the Sudbury Center Improvement project area should be avoided.

Existing Land Use

Sudbury Center is located on an upland plateau near the geographic center of Sudbury and is linked to adjacent towns by Route 27 and Concord Road. The center is a largely residential district with many attractive, historic, single-family, wood-frame structures on landscaped lots. The town center is also distinguished by several important civic and religious institutions of outstanding historical, architectural and visual merit.

A few industrial, commercial or retail establishments exist just west of the town center.

Civic Institutions

Sudbury Town Hall - After Town Hall was destroyed in a fire in 1929, it was rebuilt (1932) in the Greek Revival Style. A large public parking lot is located behind Town Hall and is accessible by a one-way drive on the north side of the building.

Grange Hall – Also demonstrating some Greek Revival elements, the Grange Hall was originally built in 1846, and has recently been restored and renovated.

The Hosmer House, close to the intersection, was once the site of the local post office and general store. The oldest structure in the center is the Loring Parsonage on the north side of Old Sudbury Road.

Churches - First Parish of Sudbury and its associated carriage shed is a structure of

exceptional visual and historic merit on a beautifully grassy knoll overlooking the center. Its landmark steeple and clock is visible from most of the roads approaching the area.

The Presbyterian Church, on Concord Road and built in 1896, is graced by a memorable spire and forms a gateway to the center for visitors approaching from the north.

Traffic and Roadway Conditions

Efficient traffic flow and safety are both important components of a good transportation network and a 'walkable' community. Sudbury residents have made clear their concerns are about the volume and speed of traffic in the center and for the safety of pedestrians on district streets.

Roadway Configuration - The intersection of Concord Road, Hudson Road and Old Sudbury Road in Sudbury Center is not a typical four-legged intersection. Hudson Road and Old Sudbury Road both run generally east-west. Concord Road, which runs north-south, is skewed and does not properly align at the intersection. The road shifts to the east as vehicles travel north through the intersection. Traffic is allowed on both sides of the Common island north of Concord Road, creating an independent intersection at Old Sudbury Road about 200 feet east of the main intersection.

Traffic Data Collection - The Sudbury Center study area is a zone bounded by Concord Road, Hudson Road, Old Sudbury Road, Peakham Road and Old Lancaster Road. This area covers the operation of the intersection at the historic center and the available informal bypass via Old Lancaster and Peakham Road.

Manual turning movement (MTM) counts were collected at the following five intersections. Weekday counts have been collected between the hours of 6:30 AM – 9:00 AM and 2:00 PM - 6:00 PM. Weekend counts have been collected between the hours of 9:00 AM – 10:00 AM and 2:00 PM - 6:00 PM.

1. Concord Road / Old Sudbury Road / Hudson Road
2. Concord Road / Old Lancaster Road
3. Hudson Road / Peakham Road
4. Hudson Road / Maynard Road
5. Peakham Road / Old Lancaster Road

Automatic Traffic Recorders (ATR) recorded the average daily traffic (ADT) over a 24-hour period at the following six locations.

1. Concord Road just north of the town center
2. Concord Road just south of the town center
3. Old Sudbury Road just east of the town center
4. Hudson Road between Peakham Road and Concord Road
5. Peakham Road
6. Old Lancaster Road between Peakham Road and Concord Road

The study area was observed numerous times during field visits and the data collected was analyzed to determine the operations of each intersection.

Observed Study Area Traffic Patterns

General Traffic Conditions: Area roadways all converge on the Sudbury Center intersection of Concord Road with Old Sudbury Road and Hudson Road creating a "choke point" for most local traffic. Weekday peak periods were observed on average at 7:30 A.M. in the morning and 4:45 P.M. in the evening. Near peak levels are seen over much of the day. Both peak hours feature similar levels of traffic, with the morning slightly higher. Weekend peak hour traffic is approximately 70% of that experienced during the weekday peaks.

Figure 3 depicts the Level of Service for the AM peak hour at intersections in the Sudbury Center district.

Use of Old Lancaster Road as a bypass: When congestion begins to build at the Sudbury Center intersection, traffic starts to spill onto the less heavily traveled local roads as drivers attempt to avoid the intersection. This action is confirmed through comparison of the weekend peak, when the intersection handles approximately 90% of the area traffic, with the weekday peak, when the intersection handles approximately 75% of the area traffic, accompanied with an increase in demand on the minor streets. Significant increases of approximately 150 vehicles per hour are apparent along Old Lancaster Road eastbound during the morning and westbound during the evening.

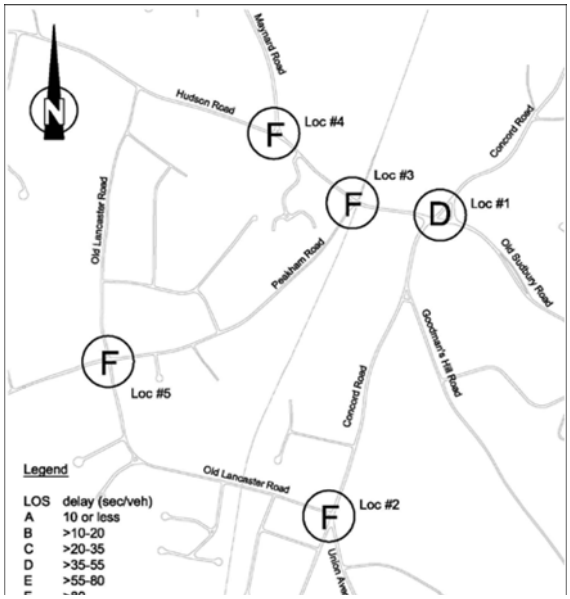


Figure 3: Regional Level of Service (AM Peak)

Hudson Road Congestion: The Hudson Road link between Maynard Road and Concord Road carries a significant volume of commuter driven demand during the peaks. This demand is approximately 1200 vehicles per hour on one direction, 600 on the opposite direction, alternating with the commute. This creates a tendency for Hudson Road to be queued over the entire length of this link at times, particularly during the morning peak. This in turn, significantly impacts the operation of the downstream intersections.

Other observations: All locations studied exhibited levels of driver frustration evidenced by aggressive vehicle operation. There is active recreational pedestrian presence in the area. Pedestrian accommodations at each of the locations need significant improvement.

Concord Road/Old Sudbury Road/Hudson Road Intersection

The Sudbury Center intersection today is controlled with what appear to be pre-timed traffic signals. These pre-timed signals operate one phase for each directional axis, with a slight

advance provided for the northbound and eastbound approaches. The intersection handles significant through volumes on each approach and a high volume of northbound and eastbound left turns. There is also a secondary roadway in front of Town Hall that serves additional turning movements between Old Sudbury Road and Concord Road to the north.

Several problems were observed at this intersection. The post-mounted equipment appears old and mismatched, and inadequately positioned. Physical space for turning movements within the intersection is limited and awkward, creating difficulty for motorists, indecision and excessive slowing of movement, and inefficiency in the intersection. Pre-timed signals are incapable of taking advantage of fluctuations in demand, as newer signals using roadway detectors are able. The left turn demand is consistently high for both the northbound and eastbound approaches. A significantly high volume of 407 vehicles was counted making the eastbound left turn during the morning peak. There is currently a lack of pedestrian signals, which is a deficiency that will likely need to be remedied with any proposed future improvements. Inclusion of pedestrian signals, however, will decrease the efficiency of the traffic signals by taking away time currently used to process vehicular movements. Traffic tends to form queues of at least ten vehicles on the northbound, southbound and eastbound approaches during the morning and weekend peak periods and on all approaches during the evening peak. Traffic also exhibited many incidences of directional confusion, evidenced by the observation of many turnaround maneuvers using the secondary roadway in front of the Town Hall. Turning movements into driveways in the vicinity of the intersection are also reported to create backups negatively affecting intersection performance.

As can be seen on Figure 3, Intersection Level of Service (LOS) under existing conditions is poor - averaging D during the morning peak hour and afternoon peak hours Under a Level of Service – D an average driver can expect to be delayed between 35 and 55 seconds at the intersection.

Concord Road/Old Lancaster Road/Union Avenue Intersection

Issues at this intersection have historically centered on the awkward geometrics and disproportionate demand, however significant changes to the intersection have occurred recently bringing the Union Avenue intersection to a ninety degree angle with Concord Road. This intersection is controlled with stop signs on the Old Lancaster Road and Union Avenue approaches. The curve in the Concord Road northbound approach and the offset between the Union Avenue and Old Lancaster Road still create challenging sight lines for drivers and unpredictable turning movements. This intersection featured a high display of driver frustration of the intersections studied. Union Avenue delivers similar and often higher volume than the Concord Road northbound approach and receives consistently

higher volumes from Concord Road southbound. Union Avenue exhibits a failing level of service in each of the peak periods. This leads to excessive queuing, which then creates additional demand and necessitated restrictions on Pheasant Avenue. Old Lancaster fails in the morning peak, likely due to the additional demand introduced by vehicles using Old Lancaster to bypass the Center intersection.

The composite Level of Service for this intersection is F (pre-reconstruction).

Peakham Road/Hudson Road Intersection

This intersection features delays and queues resulting from interaction with the heavily burdened Hudson Road link. This "T" intersection is controlled with a stop sign on the Peakham Road approach. There is a driveway with insignificant volume located immediately opposite to Peakham Road. Peakham Road exhibits a failing level of service in each of the peak periods and long queues during the morning and evening peaks.

Maynard Road/Hudson Road Intersection

This intersection also features delays and queues from interaction with the Hudson Road link compounded with increases in turning traffic directly proportional to the use of Old Lancaster Road as a bypass of the Center intersection. This "T" intersection is controlled with a stop sign on the Maynard Road approach with one lane for each turning movement. The Maynard Road left turn exhibits a failing or near failing level of service in each of the peak periods and long queues during the morning and evening peaks. Maynard Road right turn volume increases proportionately during the morning peak with the apparent use of Old Lancaster Road as a bypass. A similar increase is seen in the evening for the left turns from Hudson Road onto Maynard Road.

Peakham Road/Old Lancaster Road Intersection

This intersection is controlled with a stop sign on each approach, performing reasonably well with the exception of the morning peak. This period exhibits heavy demand from Peakham Road northbound and higher eastbound volume resulting from the morning use of Old Lancaster Road as a bypass. As a result of this characteristic, the morning eastbound and northbound approaches operate with a failing level of service.

Accident Data

Accident data were gathered and reviewed for the intersections in the project area. Examination of the accident data helps to define safety characteristics of the intersection by clarifying the frequency of accidents and indicators of possible causes. The following discussion highlights these observations through comparison to the local study area intersections, available regional data, and possible causes and remediation measures.

Data were provided by the Sudbury Police Department for the three-year period from 2003 to 2005, along with some partial data for years 2002 and 2006. There were a total of 80 accidents at the Sudbury Center intersections during this period with a breakdown as tabulated below.

Concord Road Intersection at Old Sudbury and Hudson Road Accident Summary

Year	Total
2002 (partial)	1
2003	19
2004	24
2005	28
2006 (partial)	8
3 Full Year Total	71

Accident data were reviewed for each of the study area intersections: Sudbury Center, Concord Rd/Union Ave/ Old Lancaster, Hudson Rd/ Peakham Rd, Maynard Rd/ Hudson Rd, Peakham Rd/ Old Lancaster. Data for these intersections were correlated with traffic volume data in the study area to compare crash rates at each of the locations. Crash rates are a measure used by the Commonwealth to clarify frequency of accidents relative to intersection volume for intersections with and without traffic signals. The crash rate at the Sudbury Center intersection was 2.38 crashes per Million Entering Vehicles. This rate is almost three times the state average for this region, which is 0.84 crashes per Million Entering Vehicle Past experience with other similar projects has shown rates typically to be between one and two crashes per Million Entering Vehicles. Crash rates higher than two are considered by many agencies as a threshold indicating the need for safety improvements. The crash rates for the project area are tabulated below.

Crash Rate Comparison

Intersections	Rate
State District 3 Averages	
Signalized Intersections	0.84
Unsignalized Intersections	0.79
Signalized Intersections	
Sudbury Center	2.38
Unsignalized Intersections	
Concord Rd/Union Ave/ Old Lancaster	1.02
Hudson Rd/ Peakham Rd	0.77
Maynard Rd/ Hudson Rd	1.28
Peakham Rd/ Old Lancaster	0.71

Another informative review is possible through comparison of the three year total number of accidents (2003-2005) to totals experienced at other intersections in the Sudbury region. The Boston Metropolitan Planning Organization publishes crash-location maps diagramming locations statewide with 15 or more crashes. The recent compilation covered the years 1997-1999 and is classified with the following breakdown: the top 5% with crash totals

between 106-678, the next 10% with crash totals between 55-105, the next 35% with crash totals between 25-54, and the remaining 50% with crash totals between 15-24. Review of these data shows that the Sudbury Center intersection experiences accident totals that would minimally place it among the top 45% of intersections by crash total in the state, and likely closer to the top 15% when considering both the data sets in the 1997-1999 data and the more recent 2003-2005 data. The crash-location maps can be used to relate the totals to other intersections in the area. Results for a sampling of locations are tabulated below, and the complete maps can be found at www.bostonmpo.org.

Regional Comparison of Boston MPO Data (1997-1999)

Intersection Sudbury Center	Number of Accidents 15-24	 25-54	 55-105	 106-678
Rte 126/ Rte 117 Lincoln	●			
Edgell Rd/Edmands Rd/Water St Framingham		●		
Rte 126/ Rte 20 Wayland		●		
Rte 2/ Rte 27 Acton			●	
Rte 128/ Rte 20 Weston				●
Sudbury Center (2003-2005)		●		

Examination of the available accident descriptions shows a number of trends in the types of accidents occurring at Sudbury Center. At least twelve of the accidents reported were angular collisions involving turning vehicles or cross traffic. Common causes for this type of accident are inadequate gaps in oncoming traffic to allow completion of a turn, inadequate capacity leading to hurried movement through the intersection, inadequate intersection geometry, and poor visibility of the traffic signals. As many as eleven of the accidents were rear-end collisions, which are frequently a result of poor signal visibility at the intersection and unexpected movements at the driveways in the Center. Four sideswipe and one head-on collision are indicative of inadequate intersection geometry. This is frequently seen in conflicts along the east-west alignment of Old Sudbury Road and Hudson Road. Three accidents were described as failure to stop, which further suggests poor signal visibility. Three accidents involved pedestrians, highlighting obvious deficiency in pedestrian accommodations. Eight accidents are attributable to weather and one to animal encounter. Descriptions were not available for the remainder of the accidents.

The variety of accident types suggests several countermeasures be considered in any redesign of the intersection. Improvement to alignment of the approaches, turning lanes and corner radii will allow for safer, clearer positioning of turning vehicles. The northbound and southbound legs are misaligned causing driver confusion and the potential for accidents. Proposed improvements could address this deficiency by aligning the travel lanes such that they don't cross into oncoming traffic. The existing corner radii are too small causing large vehicles (including fire trucks) to make the turn in travel lanes designated for oncoming

traffic. Proposed improvements could increase the corner radii to allow a large vehicle to turn from its own lane to its own lane eliminating the need to cross into oncoming traffic. Overhead positioning of traffic signal faces could significantly improve visibility and clarity of allowed intersection movements. Increasing intersection capacity could reduce the occurrence of vehicles trying to hurry movements through inadequate gaps in traffic and might also allow greater flexibility in providing exclusive turning movement phasing. Pedestrian walkways, crossings and driveways also need to be improved to the extent practical.

Open Space and Environmental Resources

Public Open Space Facilities - Heritage Park is a well-maintained recreation space that wraps around the southeast quadrant of the center behind the Hosmer House. The park is a gardenesque facility with lawns, a pond, wetlands, fern beds, flowering trees and is an attractive community asset in all seasons.

Grinnell Park, at the southwest corner of the intersection, is centered on the town's memorial to its war dead. The space consists of a sloping lawn panel crossed by a sidewalk and defined by flowering trees and shrubs. The property is maintained as a public garden by a volunteer community group.

The play field at the Noyes Schools is the only active recreation facility in the district and is heavily used by youth baseball teams and their parents and friends who come to observe the games in warm weather. This facility brings more activity to Sudbury Center than perhaps any other except church services on Sunday.

The Town Common is actually located on land owned by the First Parish of Sudbury. Though surrounded by roads and driveways, the tree-shaded green is an attractive forecourt setting for Town Hall and the Grange Hall and is well used on important civic or ceremonial occasions.

Established in 1716, the Revolutionary War Cemetery on the east side of Concord Road is the site of many of the earliest burials in the town. Some of the ornately carved slate headstones are excellent examples of colonial funerary art.

Mount Pleasant Cemetery is located west of Concord Road, just north of First Parish of Sudbury. The cemetery is situated at the top of a drumlin overlooking the Center. The Revolutionary War Memorial was erected in 1896 and is in a picturesque setting on the slope of the drumlin also facing the Center. Old Town Cemetery and New Town Cemetery are located nearby.

Wetlands – A small stream south of Old Sudbury Road flows through Heritage Park and drains to Hop Brook and ultimately to the Sudbury River. A small pond is located in Heritage Park and adds an important visual amenity to that facility.

Tourism Assets – Many subtle elements in the center may be of interest to tourists. The entire historic district is an attractive visual complex that exhibits a strong sense of place unmarred by discordant elements such as overhead wires and inappropriate lighting. A program of shade tree planting to enhance fall color at selected locations could one day, make Sudbury Center a brief stop on the autumn foliage tour.

The historic cemeteries are in very good condition and are interesting links to our colonial past. Many visitors come to New England and the towns west of Boston specifically to see heritage sites. The fact that Sudbury sent many men to Concord in April, 1775 relates directly to this interest and could be emphasized.

Infrastructure Summary

Water Supply - The public water supply system is maintained by the Sudbury Water District. The system, which is available to all properties in Sudbury Center, is adequate under current demand conditions, in regard to pressure, supply, and quality.

Drainage - Sudbury Center is in the Sudbury River drainage basin. Land in the center slopes in all directions from a high point in Mount Pleasant Cemetery near Concord Road to various small brooks and drain ways and ultimately to the Sudbury River. Storm drainage does not appear to be a significant problem in the center, except for a few locations with local ponding during significant storm events.

There is evidence of some roadside erosion on both sides of Concord Road near First Parish of Sudbury and on the south side of Old Sudbury Road due to a lack of curbing at these locations.

Sidewalks – Where they exist, sidewalks are generally narrow (4'-5' wide) and are constructed of bituminous concrete without curbs. Sidewalks in Sudbury Center exist only on:

- The south side of Hudson Road west of the center
- The south side of Old Sudbury Road east of the intersection
- On the east side of Concord Road south of the intersection

The principal pedestrian route in the study area is a meandering sidewalk that is not well signed and is confusing to a newcomer. If walking from Hudson Road to Concord Road north, the existing sidewalk leads pedestrians east along Hudson Road, southeast through part of Grinnell Park at the corner of Hudson and Concord, crosses Concord Road about 150 feet south of the intersection, turns north on the west side of Concord Road to the intersection, east on Old Sudbury Road, crosses Old Sudbury Road at the Town Hall, through the Town Hall parking area, along the back side of the cemetery and back onto a sidewalk on Concord Road north of the intersection. A separate leg of the sidewalk system extends east on the south side of Old Sudbury Road to a crosswalk at the Noyes School.

Area sidewalks are in only fair condition and there is a general project wide non-conformance to the standards set forth in federal and state accessibility guidelines.

Crosswalks – Crosswalks are painted on the road surface and normal wear has rendered them indistinct. The crosswalk at the center intersection is located far from the intersection stop line on Concord Road and is hazardous due to inadequate sight distance for motorists and pedestrians alike.

Lighting – Outside of the center street lighting consists of highway-type lights ('cobra head') mounted on wood utility poles. Close to the center, ornamental, incandescent lanterns in the 'colonial' style light the walks and road edges.

In an effort to understand the issues and concerns of key district stakeholders, members of the consultant team interviewed:

- Sudbury Police Chief - Peter Fadgen
- Town Clerk - Barbara Siira
- Peter Noyes School Principal - Annette Doyle
- Sudbury Day Organizer - Lisa Barth
- 4th of July Parade Marshall - Joe Bausk
- Memorial Day Parade Marshall - Peter Harvell
- Sudbury Historical Society - Lee Swanson

Unsurprisingly, these residents and officials cited traffic volume and operational issues such as turning movements as principal concerns.

Traffic Volume

- A large component of traffic volume is local traffic.
- Many parents drop off their children at the 700-student Noyes School. Traffic volume drops "by half" when school is not in session.
- A high school game day can cause a mile backup on Concord Road.
- Westbound traffic can back up Old Sudbury Road as far at the Methodist Church during the morning rush hour (7:30 – 9:15 AM) and afternoon rush hour (3:00 – 5:30 PM).
- Eastbound traffic on Hudson Road can back up to the synagogue during rush hours.
- Typically, only three northbound vehicles on Concord Road wishing to turn west on Hudson Road can pass through the intersection on a single signal phase. When this happens, some motorists continue north through the intersection, turn right in front of Town Hall and west on Old Sudbury Road through the intersection.
- Misalignment of the intersection causes traffic "friction".
- If 'Village Green' is converted to residential condominiums, vehicles in the parking lot will find it very difficult to exit onto Hudson Road.
- A considerable volume of traffic cuts through Old Lancaster Road to Peakham Road during rush hours.

Safety

- Eastbound vehicles on Old Sudbury Road in the morning drive on the right hand grass verge to get around parents turning into Noyes School driveway from Old Sudbury Road.
- Northbound vehicles on Concord Road also drive on the right hand grass verge to get around parents turning into the First Parish of Sudbury lot.
- Crosswalks are poorly marked; Crosswalk at the center intersection is a particular hazard.
- Sidewalks in some locations are in poor repair.

Overview

The Committee felt that it was important that the design effort be rooted in the specific values of Sudbury residents. They further felt that a critical element of the design process must be to solicit public opinion and to discuss the goals to be pursued and objectives to be accomplished in achieving a Sudbury Center that reflects community values.

The Committee hosted the Visioning Workshop on May 31, 2006 from 7:00 to 9:30 p.m. at the Sudbury Town Hall. At this workshop, the consultant team presented an overview of the existing conditions in the center, observations on the issues to be resolved and opportunities to be realized in developing the improvement plan. After the presentation, approximately 90 workshop attendees divided into four workgroups to identify issues in the study area and goals and objectives for the improvement effort.

The community's recorded goals and objectives served as the guiding principles for the design recommendations developed as part of the improvement plan.

Summary of Community Goals

From comments made by the stakeholders and with the guidance of the Committee, a list of project goals was developed and subsequently refined. Goals reflect the principal issues and concerns of Sudbury residents. These goals directed the design approach for improvements needed within the district. The goals for the Sudbury Center Improvement Plan should be considered as the broad strategy for attaining a successful outcome in the eyes of the community.

- *Preserve and protect historic, cultural and natural resources in the center.*
- *Improve safety and accessibility for all those that use Sudbury Center.*
- *Improve traffic flow, but not traffic speed, through the center.*
- *Protect the existing scale and visual character of the center.*
- *Establish a clear sense of the town center as a civic location.*

Community Objectives

The objectives for the improvement plan should be thought of as the specific tactics (or the road map) for attaining the plan goals. After lists of potential improvements were assembled, each workshop participant was provided with seven green dots to identify his or her most important objectives. Through this "budgeting" process, the most important improvement plan objectives were identified, i.e. the ones with the most green dots.

Participants were also provided with one black dot. The black dot was placed next to a specific action the individual felt was incompatible with community values and should be 'vetoed'.

All of the objectives identified below have been divided into specific categories that roughly correspond to the goals. The categories include heritage / preservation, pedestrian safety, circulation, open space, and visual character. The following lists summarize the objectives that were discussed during the workshop. The items gathering the most votes are shown in **bold.**

Heritage / Preservation

Green Dots:

- **Preserve rural character. (23)**
- **Give high priority to protection of historic assets and spaces when assessing roadway alignment alternatives. (18)**
- **Village Green historically had retail. If it becomes residential, where will you go to get the paper? (7)**
- Develop "Sudbury History Trail", a self-guided walking tour. (6 green, 2 black)
- Protect the cemetery headstones from Concord Road traffic. (5)
- Develop a program to interpret historic assets. (2)
- Encourage tourism and visitors from adjacent areas through promotion and marketing of Sudbury's village character and heritage events. (2)
- To the extent possible, identify visible and buried historic assets. (1)

Black Dots:

- **Encourage tourism and visitors from adjacent areas through promotion and marketing of Sudbury's village character and heritage events. (18 black)**

Open Space

Green Dots:

- **Create linked open space system connected by pedestrian walks. (16)**
- Inventory the open space resources in the center to determine role, usage, and opportunities. (6)
- Preserve and protect ecologically sensitive areas such as wetlands. (4)
- Preserve and protect heritage areas such as cemeteries. (4)
- Increase public awareness of open space assets in the center. (3)
- Develop an appropriate open space signage system. (3)
- Review the existing individual spaces in the center for opportunities to enhance the larger spatial experience. (1)
- Coordinate efforts of the town departments and citizen interest groups on maintenance and promotion of open spaces. (1)

Black Dots:

- Increase public awareness of open space assets in the center (1)

Circulation

Green Dots:

- **Recommend roadway alignment and cross-section improvements to improve traffic movement, but not traffic speed. (21)**
- **Recommend signal phasing changes, if appropriate. (18)**

- **Recommend possible alternate entries/exits for local traffic destinations/generators. (12)**
- Review the schedules of local traffic generators for congestion impacts. (9)
- Study existing roadway conditions, and assess the peak flows, movements, and directions. (8)
- Improve traffic flow in Sudbury Center. (8)
- Recommend signage and striping improvements to improve flow. (5)
- Main problem is cross left turns on Route 27. (3)
- Improve traffic lights (in phases if it is not economically feasible to do the improvements all at once). (2)
- Review curb cuts in center for possible consolidation. (1)
- Improve traffic flow on Sudbury Center roadways. (1)
- Address turning issues. (0)

Black Dots:

- Review parking regulations, if appropriate (3)
- If you increase capacity they will come (1)

Pedestrian Safety

Green Dots:

- **Improve convenience and safety for pedestrians through better sidewalks and more visible crosswalks. (22)**
- **Review the utility of traffic calming techniques, such as textured crosswalks. (15)**
- **Acknowledge community gathering spots in the pedestrian circulation system. (6)**
- **Align sidewalks with desired movements of pedestrians. (4)**
- Wheelchair, stroller, and cycling needs should to be addressed. (4)
- Add destinations. (4)
- Kids need crossing guards at all major road crossings! (3)
- Address cycle-ability; the town does not provide busing for children who live less than two miles from the school. (3)
- Improve walk-ability in Sudbury Center. (5)
- Make sidewalks universally accessible. (1)

Visual Character

Green Dots:

- **Preserve the spatial character and simple landscape design of an early Nineteenth Century agricultural community. (30)**
- **Relocate unfortunate visual elements, such as signal control box / transformer. (17)**
- **Individual homeowners should be encouraged to install appropriate walkway and carriage lights. (12)**
- **Streetlights should be adequate to enhance safety in public places; they should be appropriately scaled and should provide visual detail in daylight. (10)**

- Enhance the character of the Town Common as a civic place. (9)
- Implement streetscape improvements, including the addition / removal / up-limbing of trees, and the repairing of walls in the center, at the cemeteries, and on the approach roads. (8)
- The Town should encourage a holistic approach to lighting in the town center, including Town Hall, driveways, and parking lot lights. (7)
- Look for opportunities to organize the spatial experience in the center with simple landscaping – screen parking lots, reinforce pedestrian routes, and shape important places. (7)
- Review regulatory signage for opportunities to reduce impact on visual assets in center. (6)
- Look for opportunities to create view corridors by very selective removal of 'volunteer' trees. (5)
- Preserve opportunities for planting islands/edges/pocket gardens. (5)
- Preserve Sudbury Center's visual character. (4)
- Rehab Town Hall, Flynn Building. (1)
- Make the center more tourist friendly (signs and trail). (1)
- Make town center a center for town programs/activities – ex. summer concerts, festivals, theater (comment on the side that the school has these facilities). (1)
- Address new cemetery road. (0)

Black Dots:

- Street lights should be adequate to enhance safety in public places, should be appropriately scaled, and should provide visual detail in daylight. (2)
- Look for opportunities to create view corridors by very selective removal of 'volunteer' trees. (1)

This section describes the design team's approach to developing improvement alternatives that will achieve the goals for the Sudbury Center area identified by the Committee and the larger community. The improvement plan recommendations are focused on reducing congestion and strengthening the functional qualities of the roads, while not increasing traffic speed. They should improve pedestrian safety and "walk-ability" by clarifying pedestrian zones and better articulating crosswalks, while preserving the priceless visual character of the district.

Based on observations of Sudbury Center road operations, several conceptual alternatives were studied by the design team for relative traffic operations improvement and physical impact on the landscape. After internal analysis, the team concluded that three potential road improvement design alternatives demonstrate the range of feasible improvements. These three alternatives cover a range of interventions from modest changes that address road restriping, traffic signal improvements and signage changes, to significant circulation changes that will include addition of turning lanes, road curb re-alignment, and negotiations with abutting stakeholders for land required for construction.

Roadway Alternative Concepts

Baseline Improvements Alternative

Baseline improvements have been defined as those upgrades that could be achieved within the existing roadway curb lines. The improvements would accomplish minor enhancements to the intersection and pedestrian environment, but would not accomplish the broader goals and objectives for Sudbury Center that have been defined within this planning process. In general, these are relatively modest changes to the roadway, and focus on creating clear, safe, pedestrian routes through the center, redirecting some driveway traffic, and reducing the number and extent of curb cuts to minimize unexpected vehicle movements.

The baseline improvements serve several purposes:

- The baseline improvements are common, necessary elements associated with any of the more extensive options that would more fully accomplish the goals and objectives defined in this study. The specific design of the baseline improvements would nevertheless vary, depending upon the final alignments that are chosen.
- The same baseline improvements could be accomplished as an interim project leading towards further improvements. This approach, however, is likely to be less cost effective and result in a more extended disruption due to construction.

Improvements recommended as baseline improvements include:

- Replace pre-timed (existing) traffic signal equipment at the center intersection with digitally controlled modern signals. Signals should include roadway detectors and on-demand pedestrian crossing phase that will allow more control over signal phasing and cycle duration.
- Relocate pedestrian crosswalk on Concord Road south of Hudson Road to a location at the intersection protected by a stop line.
- Construct a new sidewalk on Hudson road at Grinnell Park to link the existing sidewalk to the new intersection crosswalk.

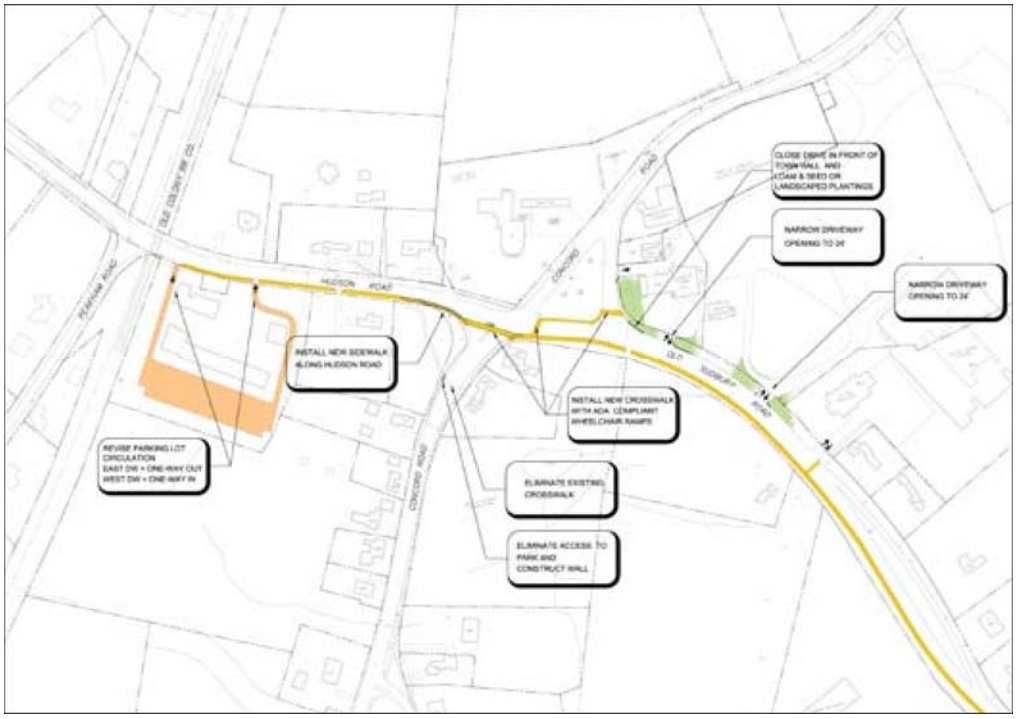


Figure 4: Baseline Improvement

- Demolish and remove the sidewalk within Grinnell Park linking the former Concord Road crosswalk to Hudson Road.
- Close the gap in the Grinnell Park stonewall adjacent to the former Concord Road crosswalk, to discourage pedestrians from crossing the street and entering the park at this location.
- Add a new pedestrian crosswalk on Old Sudbury Road from the Hosmer House to the center island in front of Town Hall.
- Create a new sidewalk and crosswalk at the center island, linking the intersection to Town Hall.
- Create a new crosswalk on Concord Road at the center island, linking First Parish of Sudbury to the driveway at the Grange Hall.
- Improve signage and road striping.
- Improve crosswalks for greater visibility on Old Sudbury Road at the Flynn Building.
- Improved crosswalks on principal roads could take the form of high-visibility thermo-plastic striping or unit pavers in the pedestrian-traveled way.
- Improve sidewalks on south side of Old Sudbury Road and east side Concord Road for ADA compliance and drainage.
- Demolish and remove small driveway loop in front of Town Hall.
- Narrow the excessively wide driveway 'throats' on the south side of Town Hall and Noyes School entry to 24 feet.
- Reverse the direction of driveways serving 'Village Green' development to allow vehicles to exit the site safely, and with less impact on the operation of the Hudson Road/ Peakham Road intersection.

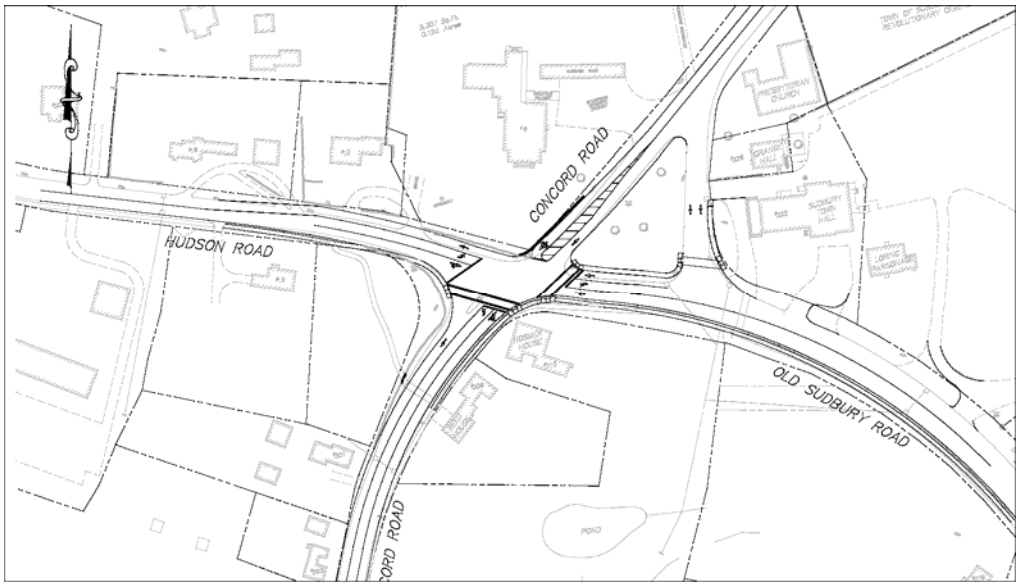


Figure 5: Alignment Option A

Alignment Option A – Simplified Approach

Roadway improvements under this alternative will revise the approaches to the intersection for a modest increase in some lane widths and a straighter lane alignment across the intersection. These revisions will require a relocation of some curb lines on Old Sudbury Road and Concord Road. This option incorporates the elements of the baseline improvements, but configures the elements consistently with the design and operational requirements of this specific alignment.

Improvements that would be accomplished if Alignment Option A were implemented include:

- Incorporate the baseline improvement elements.
- Relocate the Old Sudbury Road curb line at the Hosmer Hose to the north, by approximately 6 feet, to improve lane alignment.
- Relocate the Old Sudbury Road northern curb line at the center island, by approximately 9 feet to the north, to improve lane alignment.
- Relocate the southern Hudson Road curb line at Grinnell Park to the north, by approximately 4 feet, to improve lane alignment.
- Relocate the northern Hudson Road curb line at First Parish of Sudbury to the north, by approximately 9-12 feet, to improve lane alignment and turning radius.
- Relocate the northern Hudson Road curb line at #10 Hudson Road to the north, by approximately 7 feet, to improve lane alignment.
- Relocate the western Concord Road curb line at First Parish of Sudbury to the west, by a maximum of 12 feet, to improve lane alignment and turning radius.
- Relocate the eastern Concord Road curb line at the center island to the east, by a maximum of 4 feet, to improve lane alignment.
- Relocate the western Concord Road curb line at Grinnell Park to the east, by a maximum of 5 feet, to improve lane alignment and turning radius.
- Remove the Concord Road traffic island at Grinnell Park to improve truck-turning movement.
- Install vertical curbs at the center streets to better control vehicles.

- Improve the drainage system on the center streets.
- Install a cobblestone median ('gore') on Concord Road to allow truck-turning movement while defining lanes.
- Relocate the stonewall at Grinnell Park.
- Install a low stonewall at First Parish of Sudbury lawn to retain lawn slope.

The graphic illustrates the (red) area of curb realignment required for the construction of Alignment Option A.

Figure 6: Alignment Option A Land Take Color

Other improvements that may be considered for inclusion with Alignment Option A include:

- Convert the road in front of Town Hall to a narrower pedestrian walk with emergency vehicle passage.
- Implement landscape and circulation improvements to Town Common.
- Develop sidewalks on the north side of Old Sudbury Road between the center and Noyes School.
- Add pedestrian actuated signals and textured unit pavers at crosswalks.
- Improve lighting in the center.
- Develop a Sudbury Heritage Trail.

Alignment Option B – Significant Approach

This alternative involves the reconstruction of a significant portion of the paved surfaces in Sudbury Center. The reconstruction would create dedicated right turn lanes and would control southbound Concord Road through-traffic wishing to drive in front of Town Hall to westbound Old Sudbury Road and turn left at the intersection to rejoin southbound Concord Road traffic. This is accomplished by extending the southeast corner of the common island east along Old Sudbury Road to prevent right turns onto Old Sudbury Road westbound. These changes would require negotiations with abutting property owners such as First Parish of Sudbury and other landowners near the intersection.

Figure 7: Alignment Option B Line Drawing

Improvements proposed under the Alignment Option B include

- Incorporate the baseline improvement elements.
- Relocate the Old Sudbury Road curb line at Heritage Park to the south, by approximately 7 feet, to improve lane alignment.
- Relocate part of the Old Sudbury Road northern curb line at the center island, by approximately 9 feet to the north, to improve lane alignment.
- Extend the Old Sudbury Road northern curb line at the center island, by approximately 40 feet to the east, to prevent southbound Concord Road through traffic from looping in front of Town Hall to westbound Old Sudbury Road and turning left at the intersection to rejoin southbound Concord Road traffic.
- Relocate the southern Hudson Road curb line at Grinnell Park to the south, by approximately 16 feet, to allow creation of a dedicated right turn lane.
- Relocate the northern Hudson Road curb line at First Parish of Sudbury to the north, by approximately 10-18 feet, to improve lane alignment and turning radius.

- Relocate the western Concord Road curb line at First Parish of Sudbury to the west, by a maximum of 21 feet, to create a dedicated right turn lane.
- Relocate the western Concord Road curb line at Grinnell Park to the east, by a maximum of 5 feet, to improve lane alignment and turning radius.
- Install a new right turn lane on eastbound Hudson Road at Concord Road.
- Create a new traffic island on eastbound Hudson Road at Concord Road to allow pedestrians to cross Concord road in shorter, safer segments.
- Install vertical curbs at the center streets to better control vehicles.
- Improve the drainage system on center streets.
- Relocate the stonewall at Grinnell Park.
- Install a low stonewall at the First Parish of Sudbury lawn to retain lawn slope.

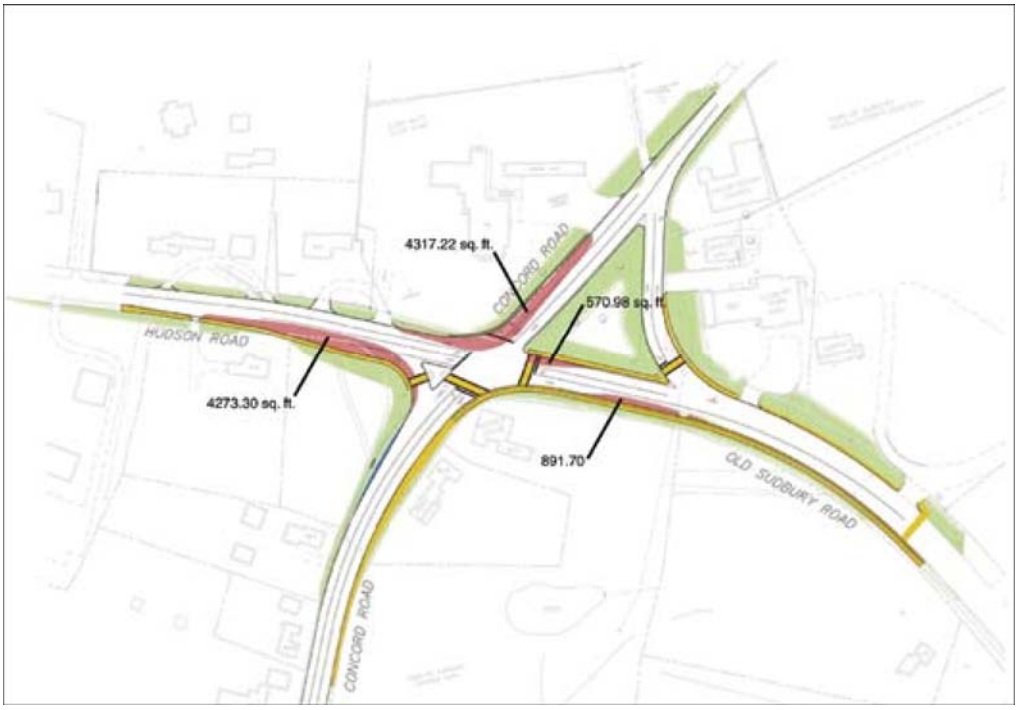


Figure 8: CGI Alignment Option B Land Take Graphic

The graphic illustrates the (red) area of curb realignment required for the construction of Alignment Option B.

Other improvements may include:

- Convert the road in front of Town Hall to a narrower pedestrian walk with emergency vehicle passage.
- Implement landscape improvements to the Town Common.
- Develop sidewalks on the north side of Old Sudbury Road between the center and Noyes School.
- Add pedestrian actuated signals and textured unit pavers at crosswalks.
- Improve lighting in the center.
- Add landscape planters at the island.
- Develop a Sudbury Heritage Trail.

Alignment Option B1- Attached Town Common Island

The design team also considered a variant of Alignment Option B that removed the "no-name" road at Town Hall and created a contiguous green-space between the Town Hall and Concord Road. The team felt that this option created an opportunity to develop a traditional 'green' at the center of the district and offered an improved venue for civic celebrations and gatherings.

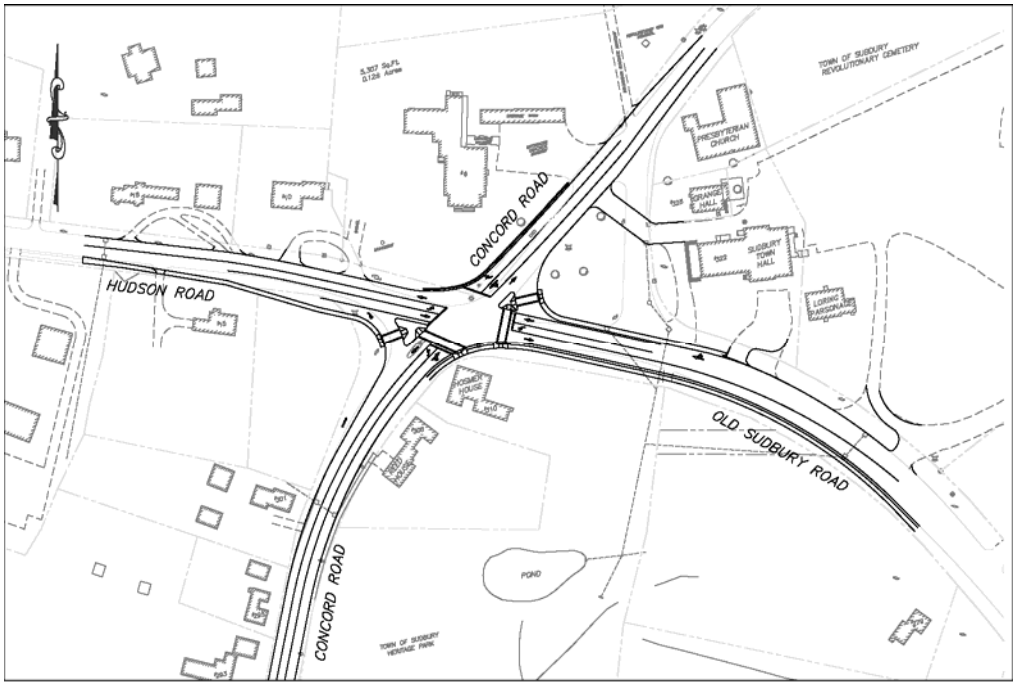


Figure 9: SEA Align Option B1 Attached Island

Other Roadway Alignments

At various stages of discussion, committee members suggested alternative alignments other than those discussed above, including moving the Hosmer House and its next door neighbor eastward to allow better alignment with Concord Road north; constructing Concord Road south through Heritage Park to an intersection with the Un-named Road in front of Town Hall; and curving Concord Road north so that it meets the intersection with Hudson Road/Old Sudbury Road at a more acute angle. The traffic consultants rejected these ideas as not providing best engineering practices.

Alternative Concepts - Level of Service Impacts (LOS)

Baseline Improvements Alternative

The Level of Service change associated with the Baseline Improvements will realize some modest benefits in operational efficiency during off-peak hours due to an increased ability to match signal cycles and phase lengths to actual traffic load. Peak Hour Level of Service over the next ten years can be expected to decline from the existing condition due to a natural increase in regional development. When all lanes are operating at or beyond capacity, adjusting signal phasing without modifying curb lines, lane alignments, and turning radii will not yield overall improvements in traffic flow and Level of Service.

Queue length along westbound Old Sudbury Road during the morning peak hour is expected to be six car lengths. Concord Road southbound queue length is expected to be 13 car lengths in the morning peak hour. Evening peak hour queue length on westbound Old Sudbury Road is expected to be 25 car lengths. Evening peak hour queue length on Concord Road southbound is expected to be 24 car lengths. It should be noted that queue length alone is an imprecise indicator of driver delay and road capacity, and should be reviewed with caution.

This alternative may increase pedestrian safety by providing improved demarcation of crosswalks and continuous sidewalks, and by removing dangerous street crossings in the center.

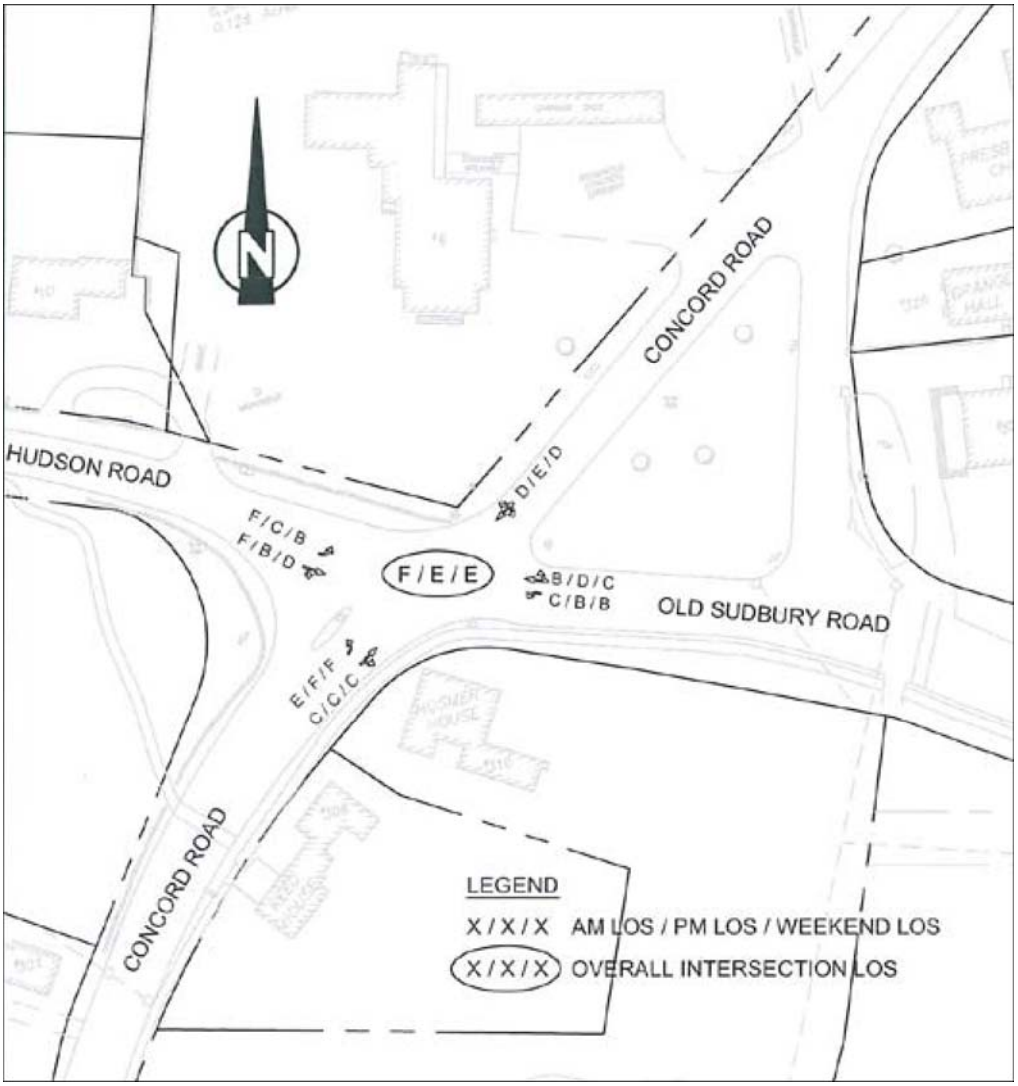


Figure 10: SEA Level of Service Baseline Alternative

Intersection Performance Summary

Alternative	Level of Service		
	AM	PM	Weekend
Baseline Improvements	F	E	E
Hudson Road EB Left	F	C	B
Hudson Road EB Through/Right	F	B	D
Old Sudbury Road WB Left	C	B	B
Old Sudbury Road WB Through/Right	B	D	C
Concord Road NB Left	E	F	F
Concord Road NB Through/Right	C	C	C
Concord Road SB Left/Through/Right	D	E	D

Alignment Option A

Alignment Option A yields some improvement in Level of Service on eastbound Hudson Road during the weekday morning peak hour, and improvement on northbound Concord Road during the weekend peak period. These improvements are generally due to improved lane alignment. The Overall Intersection LOS has improved from an F/E to a D (from a 55-80+ second delay to a 35-55 second delay).

Queue length along westbound Old Sudbury Road during the morning peak hour is expected to be 11 car lengths. Concord Road southbound queue length is expected to be 21 car lengths in the morning peak hour. Evening peak hour queue length on westbound Old Sudbury Road is expected to be 26 car lengths. Evening peak hour queue length on Concord Road southbound is expected to be 23 car lengths.

This alternative also yields pedestrian realm benefits by providing more and better-demarked crosswalks at locations protected by intersection stop lines and traffic signals.

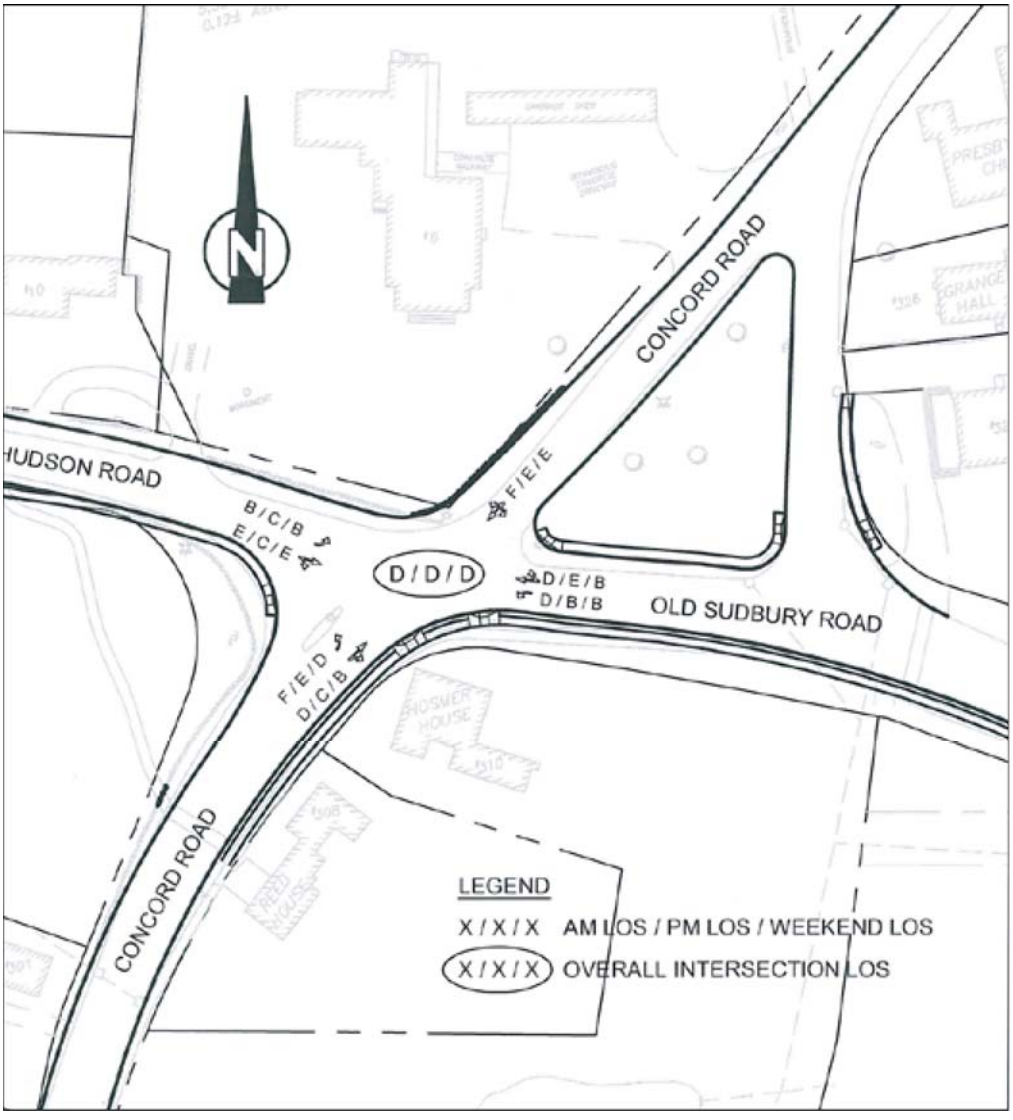


Figure 11: Level of Service Alignment Option A

Intersection Performance Summary

Alternative	Level of Service		
	AM	PM	Weekend
Alignment Option A	D	D	D
Hudson Road EB Left	B	C	B
Hudson Road EB Through/Right	E	C	E
Old Sudbury Road WB Left	D	B	B
Old Sudbury Road WB Through/Right	D	E	B
Concord Road NB Left	F	E	D
Concord Road NB Through/Right	D	C	B
Concord Road SB Left/Through/Right	F	E	E

Alignment Option B

By relocating curb lines on all four sides of the intersection, increasing curb radii at corners, and adding dedicated right turn lanes on both eastbound Hudson Road and southbound Concord Road, this alternative provides significant improvements in Level of Service on several intersection legs. The establishment of well-defined lane assignments will also enhance traffic and pedestrian safety.

Because the dedicated right turn lane reduces congestion and increases queuing capacity on Hudson Road eastbound, this leg achieves B and D LOS during the weekday morning peak hour. Southbound Concord Road, with its dedicated right turn lane and additional queuing distance, and northbound Concord Road, with slightly wider lanes, achieves C and D LOS during the same period. Old Sudbury Road westbound achieves C and B Levels of Service during the same morning rush hour.

The Overall Intersection LOS has improved from D under the Alignment Option A to C's and B (10-35 second delay) under this alternative.

Queue length along westbound Old Sudbury Road during the morning peak hour is expected to be six car lengths. Concord Road southbound queue length in the morning peak hour is expected to be nine car lengths in the through lane, and three car lengths in the right lane. Evening peak hour queue length on westbound Old Sudbury Road is expected to be 26 car lengths. Evening peak hour queue length on Concord Road southbound is expected to be nine car lengths in the through lane, and five car lengths in the right lane.

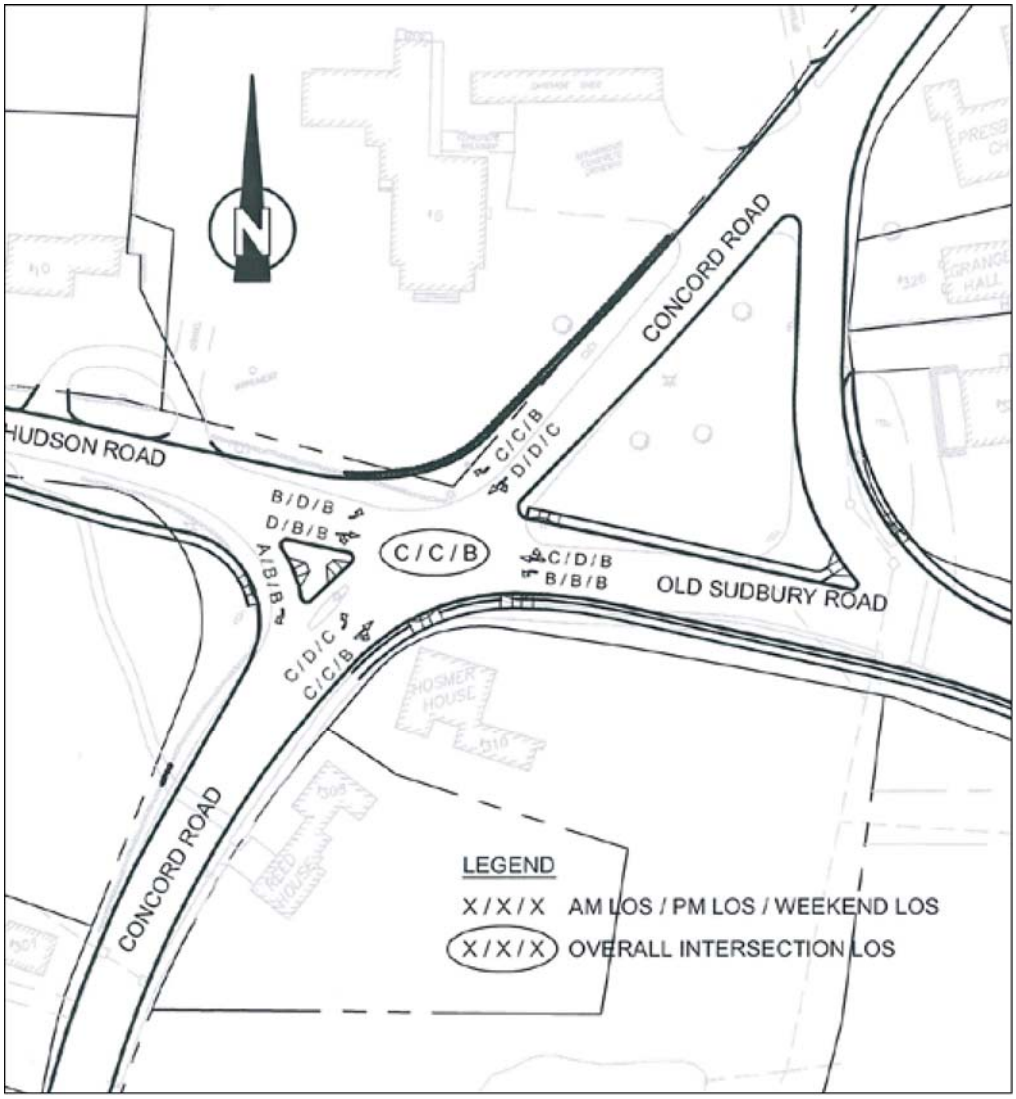


Figure 12: Level of Service Alignment Option B

Intersection Performance Summary

Alternative	Level of Service		
	AM	PM	Weekend
Alignment Option B	C	C	B
Hudson Road EB Left	B	D	B
Hudson Road EB Through	D	B	B
Hudson Road EB Right	A	B	B
Old Sudbury Road WB Left	B	B	B
Old Sudbury Road WB Through/Right	C	D	B
Concord Road NB Left	C	D	C
Concord Road NB Through/Right	C	C	B
Concord Road SB Left/Through	D	D	C
Concord Road SB Right	C	C	B

Alignment Option B1 - Attached Common

This sub-option is largely based on the Alignment Option B and includes the elimination of the "no-name" road in front of Town Hall. The change forces southbound Concord Road traffic wishing to turn left onto eastbound Old Sudbury Road to pass across the northbound Concord Road traffic lane. This turn reduces the Level of Service for the left turn lane on southbound Concord Road to E.

Queue length along eastbound Old Sudbury Road during the morning peak hour is expected to be 13 car lengths in the through lane and three car lengths in the right lane. Concord Road southbound queue length in the morning peak hour is expected to be nine car lengths in the through lane (just below First Parish of Sudbury driveway) and three car lengths in the right lane. Evening peak hour queue length on westbound Old Sudbury Road is expected to be 19 car lengths in the through lane. Evening peak hour queue length on Concord Road southbound is expected to be 12 car lengths in the through lane and four car lengths in the right lane.

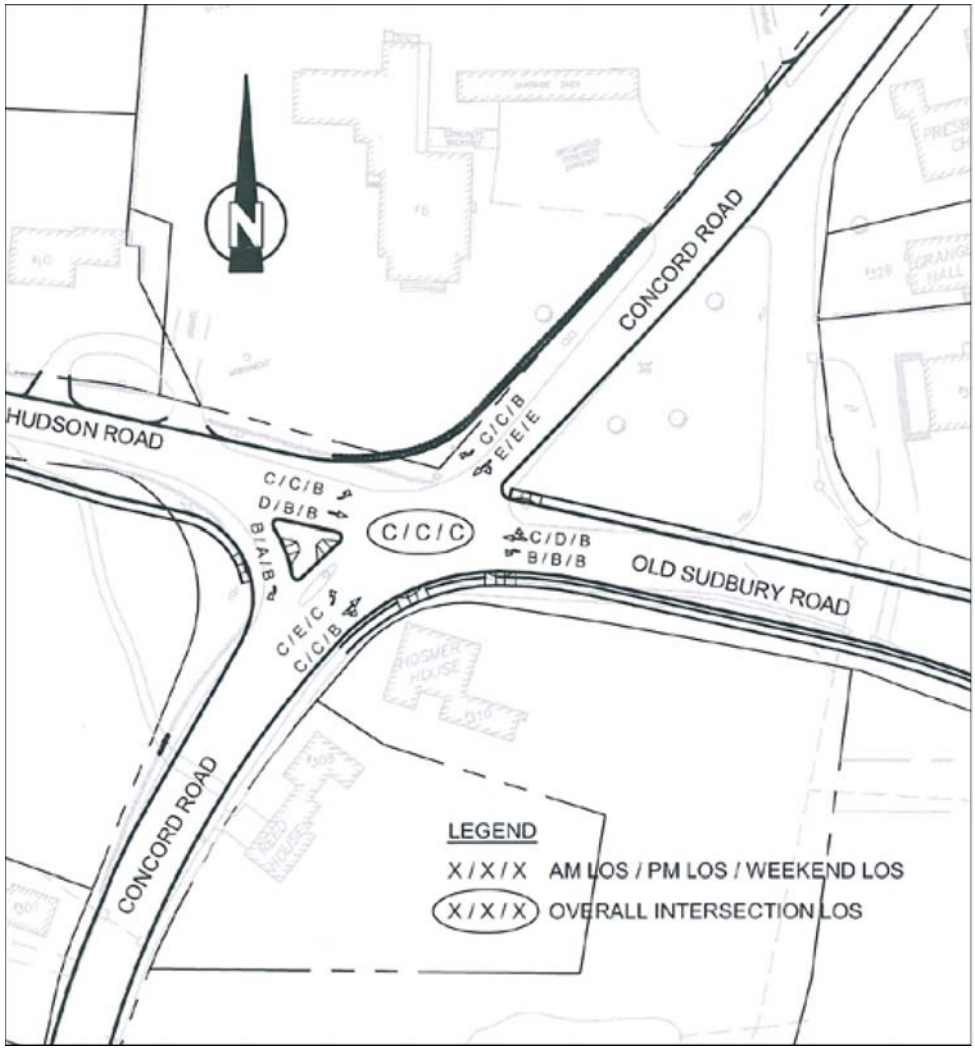


Figure 13: Level of Service Alignment Option B1

Intersection Performance Summary

Alternative	Level of Service		
	AM	PM	Weekend
Alignment Option B 1 - Attached Common	C	C	C
Hudson Road EB Left	C	C	B
Hudson Road EB Through	D	B	B
Hudson Road EB Right	B	A	B
Old Sudbury Road WB Left	B	B	B
Old Sudbury Road WB Through/Right	C	D	B
Concord Road NB Left	C	E	C
Concord Road NB Through/Right	C	C	B
Concord Road SB Left/Through	E	E	E
Concord Road SB Right	C	C	B

Alternative Concepts - Lane Interference Improvements

At the initial presentation of these options, the Committee requested that the design team assess the safety improvements expected under Alignment Option A and Alignment Option B.

Currently, the tracks of school buses making simultaneous left turns on Old Sudbury Road and Hudson Road would theoretically interfere with (overlap) each other. This will remain the case under the Baseline Alternative.

Under both Alignment Option A and Alignment Option B, better lane alignment and improved definition of lane assignments will allow movements to occur without subsequent lane incursion (as occurs under existing conditions) and should allow for greater safety. In particular, the Old Sudbury Road westbound to Concord Road southbound left-turn movement has been shifted to better align with the Hudson Road eastbound to Concord Road northbound left-turn movement.

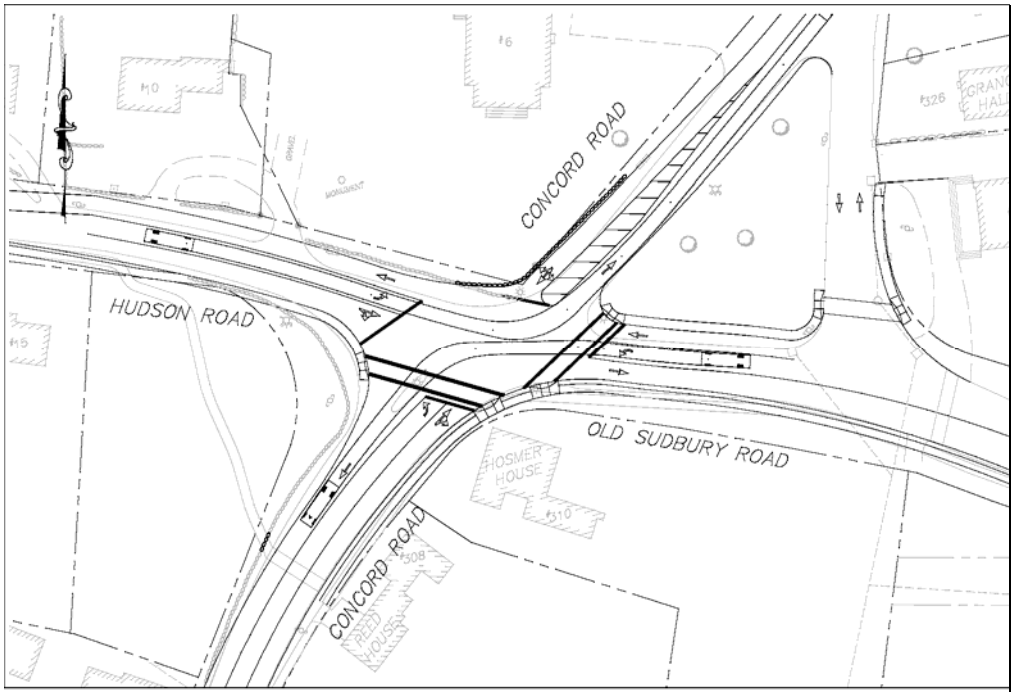


Figure 14: Alignment Option A Bus Right Turn

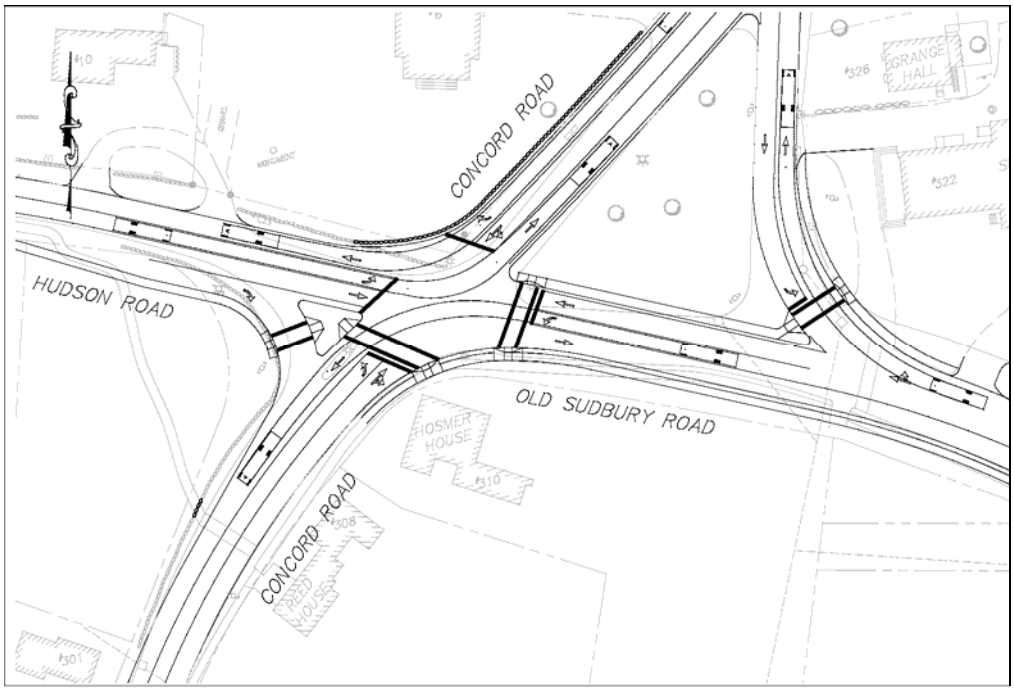


Figure 15: Alignment Option B Bus Right Turn

Alternative Concepts – Visual Impacts

After determining the revised curb layout for the Alignment Option A and Alignment Option B, the design team developed eye-level views of the visual change expected from southbound Concord Road at the First Parish of Sudbury lawn, and looking northbound on Concord Road just below the intersection. These views were intended to provide an approximation of the visual impact of the two alternatives on the First Parish of Sudbury lawn.

Alignment Option A

Under this alternative, a maximum of 12 feet of the First Parish of Sudbury lawn, tapering to zero feet at the driveway, would be required to accommodate the relocated curb line and lane width on the west side of Concord Road. The view south along Concord Road shows a cobblestone gore separating the northbound and southbound lanes, the widened roadway, and the proposed field stone retaining wall at the First Parish of Sudbury lawn.

The stone retaining wall is expected to be approximately three feet high near the Hudson Road intersection, and will taper into the lawn as the finish grade elevation of the road rises further north on Concord Road. The view also shows a simple, black traffic signal mast and arm at the intersection.

Alignment Option B

The dedicated right turn lane on the west side of southbound Concord Road at First Parish of Sudbury will require a maximum of 21 feet of lawn near the intersection, tapering to approximately ten feet at the driveway, to accommodate the relocated curb line. The view south along Concord Road shows the single northbound and two southbound lanes, the widened roadway, and the proposed field stone retaining wall. The stone retaining wall is expected to be constructed further into the lawn and will be approximately four feet high near the Hudson Road intersection, tapering into the lawn further up Concord Road near the driveway.

Figure 16: Alignment Option A South View

Figure 17: Alignment Option A North View

Figure 18: Alignment Option B1 South View

Figure 19: Alignment Option B1 Concord Road North

Landscape / Public Space Improvements

This section describes the design team's approach to developing pedestrian/public space realm improvements in the district that will achieve the community's goals for Sudbury Center. The historic character of the civic, religious, and residential structures in the district is well reinforced by mature trees, open lawns and subtly shaped landscape spaces. Therefore, we have been sensitive to resident's wishes to preserve the character of the existing early Nineteenth Century agricultural community landscape, and have looked for opportunities to develop a treatment that does not seek to do too much.

Design recommendations focus on strengthening the pedestrian experience by providing a unified character of sidewalk pavement conditions, and by organizing lighting, street furniture, and crosswalk pavement treatments to improve pedestrian's ability to move along legible routes to meaningful destinations. The center landscape can be further enhanced by introducing seating and interpretive opportunities at natural pedestrian intersections and gathering points.

Pedestrian zones and movement across Sudbury Center streets should be clarified by installation of embossed pavement or unit paver treatments and enhancement of traffic islands. Those intersecting points where potential pedestrian/vehicle conflicts may occur should receive the greatest amount of improvement. These locations occur where pedestrians navigate streets and make decisions about how and when to cross. Because these focus points are where concentrated activity may occur, they in turn take on significance as potential meeting places. Widened sidewalks in these areas allow the introduction of streetscape improvements that enhance the pedestrian experience.

The areas identified for focus were the Old Sudbury Road / Concord Road intersection, the Town Common island, the entry to Town Hall, the Presbyterian Church, the Concord Road crosswalk at First Parish of Sudbury, Old Sudbury Road at Heritage Park, and the Noyes School crosswalk.

The desire to focus improvements in specific locations also concentrates expenditures in a visible manner, which preserves budget and indicates to motorists that they are entering a true village center.

<u>Baseline Geometry Improvements Alternative</u>

Landscape/streetscape treatment under the Baseline Improvements regime moves the Concord Road crosswalk north to a location protected by the stop line at the intersection. A crosswalk across Old Sudbury Road links the Hosmer House with the Town Common island and thence to Town Hall.

The abandoned walkway through Grinnell Park should be demolished and its alignment loamed and seeded. The stonewalls lining Hudson Road and Concord Road have a "thrown-up" quality that does not befit its prominent location and should be rebuilt as a dry wall with a flat top and a perceptible batter on its sides.

Alignment Option A

A new ornamental paver crosswalk across Old Sudbury Road at the Concord Road intersection represents an opportunity to create a special place on the common island. Widening the pedestrian route at the southwest corner of the common island could allow for a small plaza with a kiosk for civic and community notices, benches, and lighting to be sited at this location. The plaza will visually anchor this end of the half-ellipse, scored concrete walkway leading across the green to the Town Hall crosswalk, and thence arcing back to meet the crosswalk at First Parish of Sudbury. The proposed unit paver crosswalk linking the common island to Town Hall should be widened and extended at least as far as the rear of the Grange Hall to remind vehicles that this driveway must be shared with pedestrians.

A new sidewalk should be constructed on the north side of Old Sudbury Road to directly connect the Flynn Building and Noyes School to Town Hall. The Old Sudbury Road crosswalk at Town Hall should be aligned with the Heritage Park walkway to provide a location for a bench, ornamental light and an interpretive marker. The walk should pass across the face of Town Hall and the Grange Hall, and end with a pedestrian plaza at the door of the Presbyterian Church

A "spur" from the Old Sudbury Road sidewalk should extend north past the Loring Parsonage to the public lot, along the athletic fields at the Noyes School, serve an interpretive station overlooking the Revolutionary War Cemetery and Mt. Pleasant Cemetery, and terminate at the Town Pound. This north-south pedestrian axis can be the principal route of the Sudbury Center Heritage Trail.

The Town may wish to selectively prune trees on the common island to open views and shape the space in front of Town Hall.

Figure 20: CGI Alignment Option A Landscape

Alignment Option B

Option B builds on the pedestrian circulation and civic space improvements described in Option A, buts treats the common island somewhat more strongly. This option suggests new tree planting be undertaken on the island to shape the green into a special volume that is centered on Town Hall. This volume expands outward in a straight line to the west until it is enclosed by the large oak trees and stonewall (proposed) on the First Parish of Sudbury lawn.

Shade trees are planted on the north side of Old Sudbury Road to enhance the natural processional created by existing trees, and bridge the special gaps caused by the formerly wide driveway "throats" at the Noyes School and Loring Parsonage.

The new traffic island on eastbound Hudson Road will allow us the opportunity to develop a small landscaped pedestrian refuge that is an extension of Grinnell Park. Planting may be either in-ground or in precast concrete planters.

The sidewalk on the south side of Old Sudbury Road has been relocated further away from the street and slightly downslope into Heritage Park to provide a walking experience that is a little less "street-oriented"

Figure 21: CGI Alignment Option B Landscape

Alignment Option B 1 – Attached Island

By removing the triangle road and attaching the common island to the Town Hall site, new space-forming/landscaping opportunities have been made practical. A new green-space has been created that is equal in size and scale to the lawn at First Parish of Sudbury. By careful tree planting and landscaping, the formidable architecture of Town Hall and its newly expanded green can open a special "conversation" with the First Parish of Sudbury. In addition, this new civic space could be a more comfortable place than the divided green (as it now exists) to host community celebrations. The lawn at the front of the Presbyterian Church and Grange Hall similarly benefit from the removal of this road.

If the dedicated right turn lanes at both Hudson Road and Old Sudbury Road are treated with embossed bituminous concrete or unit pavers, these road crossings can be made much more pedestrian-friendly and will contribute to traffic calming in the intersection.

An expanded plaza should be created at the landing of this crosswalk. Two or more benches in an intimate space shaped by low shrub plantings and focused on a kiosk and/or an interpretive exhibit will provide a visual terminus for the Town Hall green and may create a transition element between the green and the First Parish of Sudbury site.

Figure 22: CGI Alignment Option B1 Attached Island Landscape

Lighting

Street lighting – in the typical sense – is limited in Sudbury Center. Few overhead street lights are present and the public green spaces are lit by "colonial" reproduction fixtures which are approximately 8 feet tall. Some members of the community have strongly indicated that this condition is acceptable, and even desirable, to preserve the historic character of the center.

As the project advances, if the enhancement of civic spaces encourages more residents to pass through or congregate at these locations after church or town events, enhanced lighting may be needed for pedestrian safety and convenience.

The addition of ornamental lights may take the form of further copies of the existing light or a somewhat taller fixture from the same general family. The lumens rating of the luminaire should be specified to yield an appropriate amount of light consistent with the nature of the space, and the lamp type should be selected to provide a natural light color that will make the center an attractive place at night. In addition, it is critically important to set the height of the lamp above grade so that the fixture will be in scale with the pedestrian spaces that it lights. In the case of the common, or at the Hosmer House and Heritage Park entries, the lamps should be set no more than 12 feet above grade.

Some examples of historically inspired, but n replica, pedestrian lights are shown below. On shares some characteristics of the existing coloni second represents a nineteenth century "gas" fixture.

A luminaire that renders colors naturally and produces a warm light color, such as metal halide, is recommended. High-pressure sodium lighting should not be used.

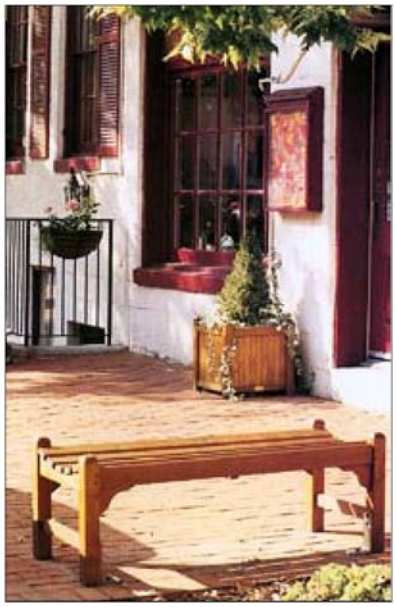
Site Furniture

Attractive streets, well-used public spaces, a pleasant walking environment, convenient, barrier-free routes, and meaningful destinations add greatly to community walk-ability and are essential to encouraging pedestrian activity. Appropriate site furniture can make a significant contribution to pedestrian comfort and orientation in these public spaces.

Benches

Site furniture such as benches, kiosks, signage, and interpretive elements should be attractively formed, of appropriate material, and in scale with the spaces they inhabit. They should enhance the pedestrian environment and support walking and cycling as attractive and viable alternatives to driving. The enhancements should also be "supporting players" for the historic character of the center.

The site bench should be a traditional, teak-style garden bench that is comfortable, and whose surface will age to an attractive silver-gray that appears to have always been in the center.



Kiosks

A kiosk can be an visual anchor element for a key space such as the proposed pedestrian plaza at the southwest corner of the common island. It can also be an arrival event for pedestrians, cyclists, and drivers entering the center. The kiosk is a location for community announcements and town events and should be prominent enough to be visible, but should not overwhelm the space.

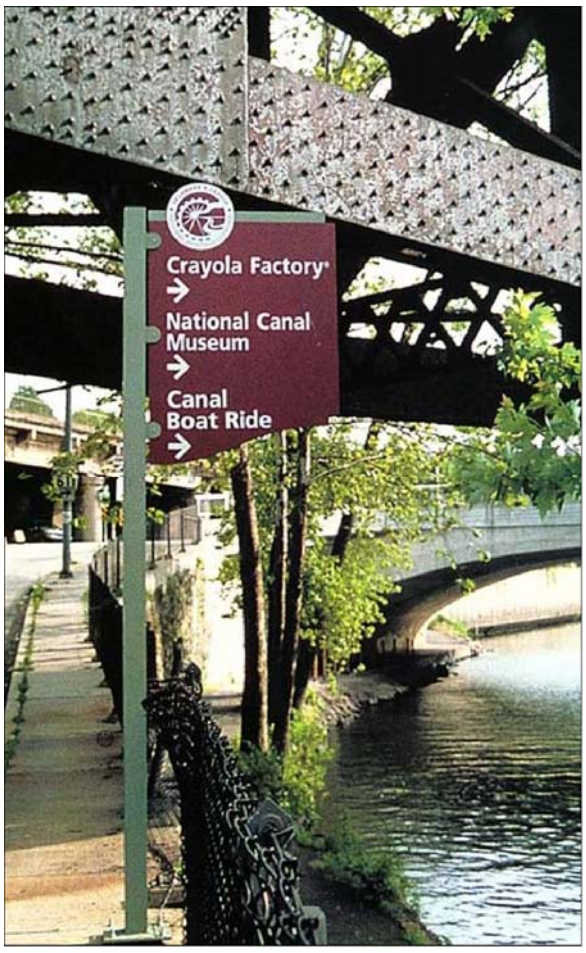
Some examples of kiosks are shown in painted wood and dark anodized metal.

Signs

With the exception of directional signs on the roads, signage in Sudbury Center is limited. While this presents an uncluttered look, the level of information signage for visitors and pedestrians could be enhanced without degrading the visual environment. An attractive signage program can assist in orienting visitors while adding architectural detail at a human scale, and can contribute to a legible, pedestrian-friendly public realm.

The existing carved and painted sign at the Old Sudbury Road entry to Heritage Park is a good example of an attractively formed and appropriately scaled arrival sign, and its character might be the basis for a more extensive system of directional signs in the district.

Additional signs that share characteristics with this example might be installed at pedestrian and vehicle decision points such as at the Flynn Building/Noyes School driveway, at Grinnell Park as visitors enter the district from the west, and at the Town Hall/Grange Hall driveway.



One of the critical issues in the realization of Sudbury Center improvements is the source of funding for capital improvements. The cost of even the Baseline Improvements is significant and may not be economically feasible for the Town to undertake without funding support from other sources and agencies.

Cost

The total cost for implementing all of the pedestrian and traffic improvement concepts proposed for the Sudbury Center district is difficult to estimate with any degree of certainty before a reliable survey is undertaken, the community is agreed on the final program, and the roadway and landscape design has advanced beyond the 25% level. Preliminary Opinions of Cost have been developed for the four basic options described in this report.

Funding Sources

The capital improvements to Sudbury Center will involve funding for both execution and maintenance. The full range of local, state and federal sources should be explored as part of the implementation effort for the streetscape and traffic improvement initiative. A brief description of a number of public funding programs that may have relevance to the implementation of the Sudbury Center district improvements follows.

Source:	MA Community Development Action Grant
Amounts:	$1 million cap; requires match by the Town.
Uses:	Community and development funds for projects that can demonstrate an economic development component; no restriction on spending but funds must be spent on publicly-owned facilities.
Timing:	State-appropriated and bonded every four years.
Note:	Matching funds can come from Town's CDBG funds.

Source:	Public Works Economic Development Grant
Amounts:	Up to $1 million spent every two years.
Uses:	Public works infrastructure improvements that result in community economic enhancement, possibly including streetscape improvements in line with the economic enhance-
Timing:	Every two years.

Source:	MA Department of Environmental Management - Historic Landscapes Program
Amounts:	$50,000 maximum.

Uses:	Grants are given to municipalities for historic parks, commons, and public buildings.
Timing:	Annual.

The Town of Sudbury may consider undertaking a historical inventory in the district. At the completion of such a process, it should be possible to determine if any structures or sites are potentially applicable for aid under the Historic Landscapes Program.

Several of these potential funding sources are geared towards transportation enhancements and infrastructure improvements and could be directly applicable to recommendations such as sidewalk, streetscape and lighting improvements.

The likelihood of acquiring funding under any of these programs or other sources depends on a variety of factors, including timing, eligibility, competing applications, aggressive support of elected officials, and legislative delegation. Because Sudbury Center occupies such an important location in the Town's history and civic life, and because its critical character is being threatened by increasing congestion in the region, Sudbury Center's comparative position should be reasonably strong in any competitive review process.

Construction Phasing

The work described under all the potential intersection improvement scenarios is likely to be carried out as a single phase because the signal upgrades, crosswalk installation and any pavement changes are all an interrelated system and must be accomplished simultaneously. Landscape and civic space improvements such as site furniture, pedestrian plazas, interpretive elements, and the Sudbury Heritage Trail system can however be easily completed as part of a later phase or as funding allows.

The phasing of street lighting and site lighting must be considered as a separate case. Ornamental lights or lights that serve the pedestrian environment can be phased, but any street lighting controls that share a power source connection with the traffic signal system or whose conduits will be routed under the streets should be coordinated with the intersection work to insure that newly paved surfaces do not have to be disturbed for later lighting improvements.

Sudbury Center Improvement Advisory Committee Review

The Sudbury Center Improvement Advisory Committee (the Committee) reviewed the alternatives as they developed, made numerous suggestions for improvements and requests for additional information as the work progressed in the summer/fall of 2006.

The design team presented revised alternatives at a Committee meeting in December, 2006. The purpose of the meeting was to try to make a Committee consensus recommendation on the preferred alternative to the Town Selectmen.

Committee comments on the individual options were:

Baseline Improvements

- Minimum intervention does not yield much benefit
- Doing "nothing" is not an option

Option A – Pros

- "Cheater loop" is not all bad – It's a relief valve
- Less impact on First Parish of Sudbury property
- Pedestrian environment improved over existing condition

Option A – Cons

- Traffic flow LOS improvement is not great
- Substantial cost ($1.75m) - will not be perceived by public as a substantial improvement
- Longest pedestrian crossing
- Doesn't cut out the "cheater loop" at Town Hall
- Moderate visual impact on center
- Largest area of intersection pavement
- Smallest green space yield
- Cobblestone gore is noisy and a maintenance problem
- Substantial impact of masts and signal arms

Option B – Pros

- Substantial improvement for the money
- Pedestrian environment improved over existing condition
- Dedicated right turn onto Hudson Road is a plus
- Pedestrian islands are good
- Noticeable improvement in LOS
- Shorter queues on both WB Old Sudbury Road and NB Concord Road
- Pedestrian routes/spaces are attractive
- Controlling WB turn on "cheater road" is good
- Does not remove "no-name" road at Town Hall – good thing - it's a historic way and removal will not be popular

Option B – Cons

- Two SB lanes on Concord Road at First Parish of Sudbury is not good
- Can only go east on Old Sudbury Road from the "no-name" road – "cheater road" is useful
- Largest impact on First Parish of Sudbury lawn
- Substantial impact of masts and signal arms
- Pedestrian island not large enough to be a "place"
- Loss of visual character
- Substantial wall at First Parish of Sudbury is not good
- Hosmer House needs more buffering – stone wall

Option B 1 – Attached Island – Pros

- Substantial increase in useable green space
- Meets widest range of Committee goals
- Maybe narrow vestige of Town Hall road can be preserved as driveway w/ unit pavers
- Enlarged common is a real plus for civic events
- Wall at First Parish of Sudbury should be lowered

Option B 1 – Attached Island - Cons

- Queues will be longer on SB Concord Road
- Historic road removed - "Cheater road" is useful
- Largest impact on First Parish of Sudbury lawn
- Left turn from SB Concord Road to EB Old Sudbury Road will be a problem
- New islands are symmetrical - not organic, like they grew there
- Too rational – bleeds character from center – it's not Sudbury
- Two traffic islands are too much - ugly
- Crosswalk is not visible when away from intersection
- Substantial impact of masts and signal arms

No consensus candidate for the preferred alternative was reached at the meeting , but in an unofficial show of hands a simple majority leaned toward Option B and its variant B1 – Attached Island.

First Parish of Sudbury Review

As a key Sudbury Center stakeholder, the parishioners of First Parish of Sudbury were keenly interested in the alternatives. The alternatives were presented at public meetings at the meeting hall in November and December, 2006. After the design team presented the alternatives and detailed the traffic flow, civic space, pedestrian safety and visual implications of each proposal, parishioners had numerous comments:

- Felt two SB lanes on Concord Road (Option B) at driveway was undesirable
- Concerned about stability of steeple during construction
- Concerned about loss of lawn under Options A and B
- Concerned about safety of children at daycare center

- Wanted to see NB Concord Road widened to allow passage of northbound vehicles when another is turning left into parking lot
- Concerned about scale of traffic signal masts and arms
- Did not want to see tall highway-type curbs in the intersection
- Did not want to see traffic signal masts placed on proposed intersection islands
- Parishioners would like to be able to park cars on Sundays on the west side of Concord Road near Mt Pleasant Cemetery. Requested curbing be sloped as opposed to straight
- Concerned about length of construction period
- Worried that excavation and grading operations under Option B would damage tree roots
- Wanted electrical transformer buried or relocated as part of center improvements
- Wanted to know what kind of compensation the Town would pay if land was given up

The First Parish congregation met in January, 2007 and agreed to support proceeding cautiously with the site survey and developing the alternatives based on a reliable survey in order to further assess the impact of the alternatives on the Parish's property and interests.

Sudbury Center Improvement Advisory Committee (SCIAC – the Committee)

June Allen

Scott Carpenter

Rich Davison

Jim Hodder

Jody Kablack, *Planning and Community Development Director*

Deborah Kruskal

Eva MacNeill

Larry O'Brien

Bill Place, *Director of Public Work*

Frank Riepe

Joe Sziabowski

Item No.	Description	Unit	Unit Price	Quantity	Amount	Remarks
						Opinion of Costs includes costs for Baseline Improvements
	Baseline Sudbury Ctr Intersection Changes					
	Reverse driveways at Sudbury	LS	$1,500.00	1	$1,500	Signs, pavement markings
	Crosswalk signs	LS	$2,000.00	1	$2,000	Blade signs at Sudbury Center crosswalks
	Thermoplastic marking at Sudbury Center crosswalks	EA	$750.00	8	$6,000	12" ladder striping - per crosswalk
	Driveway openings narrowed at Noyes Sch, Loring Parsonage and drive at Town Hall	EA	$6,300.00	3	$18,900	Demolish/remove excess pavement: $4,500. Loam, Fine grade, seed and maintain to establishment: $1,800.
	Demolish walk at Grinnell Pk loam and seed - Rebuild opening in stone wall	LS	$4,500.00	1	$4,500	
	Baseline Lane markings	LF	$1.15	5,700	$6,555	4" thermoplastic - minimum lane and shoulder markings
	Intersection signal upgrade	LS	$140,000	1	$140,000	Remove old signal system. New signal system with loop detectors at Old Sudbury Road / Concord Road. Allowance
	Subtotal				$179,455	
	5% Mobilization				$8,973	
	Total				$188,428	
	25% Contingency				$47,107	Contingency @ Pre-schematic Phase
	Total Opinion of Construction Cost in 2006 dollars				**$235,535**	
			Say		**$240,000**	

Item No.	Description	Unit	Unit Price	Quantity	Amount	Remarks
						Assume reclamation of exist. pavement to 350' east of intersection; 320' north of intersection; 400' west of intersection; 400' south of intersection. New pavement where curb alignment adjusted. ***All Opinion of Costs include costs for baseline improvements***
	Reverse driveways at Sudbury Commons	LS	$1,500.00	1	$1,500	Signs, pavement markings
	Crosswalk signs	LS	$2,000.00	1	$2,000	Blade signs at Sudbury Center crosswalks
	Driveway openings narrowed at Noyes Sch, Loring Parsonage and drive at Town Hall	EA	$8,300.00	3	$24,900	Demolish/remove excess pavement: $5,500. Fill, finegrade, loam, seed and maintain to e establishment: $2,800.
	Baseline lane markings	LF	$1.15	5,700	$6,555	4" thermoplastic - minimum lane and shoulder markings at intersection
	Old Sudbury Road / Concord Road Intersection Improvements					
102.5	Tree protection	LS	$5,000	1	$5,000	
120.1	Unclassified excavation	CY	$25	1,500	$37,500	At areas of demolished sidewalks and misc. pavement removal
120	Earth excavation	CY	$18	500	$9,000	At areas of new pavement over exist lawn
151.01	Gravel Borrow - Type C	CY	$22	500	$11,000	Allowance for 12" gravel under areas of new road pavement. Assume exist gravel at sidewalks is generally acceptable
170	Fine grading & compacting - subgrade areas	SY	$4	2,500	$8,750	Under all new road/sidewalk pavement
201.5	Catch basin- municipal std	EA	$3,500	5	$17,500	Allowance
220	Drainage Structure Adjusted	EA	$350	8	$2,800	Manhole or structure adjusted - Allowance
241.18	18 inch RCP	LF	$50	750	$37,500	Allowance
376.3	Hydrant remove & reset	EA	$2,000	2	$4,000	Allowance
358	Gate Boxes/Stops Adjusted	EA	$225	20	$4,500	Allowance
	Pavement reclamation	SY	$25.00	8,500	$212,500	At areas of exist road pavement. Top 18" of material ground, mixed, fine-graded and repaved
460	Class I Bit. Conc. Pavement - Type I-1	Ton	$65.00	320	$20,800	New road pavement at lawn areas - Allowance
504	Granite curb type VA4 straight	LF	$36	4,000	$144,000	Granite curb at edge of road to limit of work and flush edging at crosswalks per MHD std detail
685.1	Field stone masonry wall - dry	CY	$450	140	$63,000	New stone retaining wall at First Parish lawn. Assume 250' length; 42" hgt with rustic granite slab capstone
690.1	Stone masonry wall - dry - removed and rebuilt	CY	$375	75	$28,125	Free-standing stone wall at Grinnell Park - removed and rebuilt. Assume 150' length; 30" hgt - no capstone
701	Concrete sidewalk	SY	$42	1,400	$58,800	4" depth w/ scoring and expansion jts - only incidental gravel req'd
706	Unit Pavers at Crosswalks	SY	$250	1,120	$280,000	Cost incl conc. pavers on conc. base

Item No.	Description	Unit	Unit Price	Quantity	Amount	Remarks
						Assume reclamation of exist. pavement to 350' east of intersection; 320' north of intersection; 400' west of intersection; 400' south of intersection. New pavement where curb alignment adjusted. ***All Opinion of Costs include costs for baseline improvements***
765	Loam and seed	LS	$25,000	1	$25,000	Surface restoration. Incl. Loam borrow, dump, spread, fine-grade, seed and straw mulch. Maintain to establishment
775.032	Shade Tree	EA	$850	10	$8,500	Allowance. 3" - 3 1/2" cal. - installed
815	Traffic signal upgrade	LS	$180,000	1	$180,000	New signal system with loop detectors
820.02	Additional ornamental lights	EA	$4,500	6	$27,000	Allowance for additional lights similar to existing colonial fixture. Installed system cost
832.1	Warning - regulatory & Rte mkr - alum. panel TY. A	SF	$25	150	$3,750	Allowance
859	Reflectorized drums	DD	$0.75	15,000	$11,250	traffic control - 6 month project duration
867	4 inch thermoplastic pavement markings	LS	$7,500	1	$7,500	Allowance
874.2	Traffic sign removed and reset	EA	$250	8	$2,000	Regulatory signs - assume new P-5 post and footing. Allowance
999	Police details	HRS	$45	2,000	$90,000	Traffic control over 6 months
	Subtotal				$1,334,730	
	5% Mobilization				$66,737	
	Total				$1,401,467	
	25% Contingency				$350,367	Contingency @ Pre-schematic (master plan) Phase
	Total construction cost 2006 dollars				**$1,751,833**	
			Say		**$1.75 mm**	

Item No.	Description	Unit	Unit Price	Quantity	Amount	Remarks
						Assume reclamation of exist. pavement to 400' east of intersection; 350' north of intersection; 500' west of intersection; 480' south of intersection; 250' at Town Hall by-pass. New pavement where curb alignment adjusted. ***All Opinion of Costs include costs for baseline improvements***
	Reverse driveways at Sudbury Commons	LS	$1,500.00	1	$1,500	Signs, pavement markings
	Crosswalk signs	LS	$2,000.00	1	$2,000	Blade signs at Sudbury Center crosswalks
	Driveway openings narrowed at Noyes Sch, Loring Parsonage and drive at Town Hall	EA	$8,300.00	3	$24,900	Demolish/remove excess pavement: $5,500. Fill, finegrade, loam, seed and maintain to establishment: $2,800.
	Baseline lane markings	LF	$1.15	5,700	$6,555	4" thermoplastic - minimum lane and shoulder markings at intersection
	Old Sudbury Road / Concord Road Intersection Improvements					
102.5	Tree protection	LS	$5,000	1	$5,000	
120.1	Unclassified excavation	CY	$25	1,675	$41,875	At areas of demolished sidewalks and pavement removal at Common
120	Earth excavation	CY	$18	760	$13,680	At areas of new pavement over exist lawn
151.01	Gravel Borrow - Type C	CY	$22	725	$15,950	Allowance for 12" gravel under areas of new road pavement. Assume exist gravel at sidewalks is generally acceptable
170	Fine grading & compacting - subgrade areas	SY	$4	4,300	$15,050	Under all new road/sidewalk pavement
201.5	Catch basin- municipal std	EA	$3,500	5	$17,500	Allowance
220	Drainage Structure Adjusted	EA	$350	8	$2,800	Manhole or structure adjusted - Allowance
241.18	18 inch RCP	LF	$50	850	$42,500	Allowance
376.3	Hydrant remove & reset	EA	$2,000	2	$4,000	Allowance
358	Gate Boxes/Stops Adjusted	EA	$225	20	$4,500	Allowance
	Pavement reclamation	SY	$25.00	8,600	$215,000	At areas of exist road pavement. Top 18" of material ground, mixed, fine-graded and repaved
460	Class I Bit. Conc. Pavement - Type I-1	Ton	$65.00	380	$24,700	New road pavement at lawn areas
504	Granite curb type VA4 straight	LF	$36	4,300	$154,800	Granite curb at edge of road to limit of work and flush edging at crosswalks per MHD std detail
685.1	Field stone masonry wall - dry	CY	$450	170	$76,500	New stone retaining wall at First Parish lawn. Assume 250' length; 48" hgt with rustic granite slab capstone
690.1	Stone masonry wall - dry - removed and rebuilt	CY	$375	75	$28,125	Free-standing stone wall at Grinnell Park - removed and rebuilt. Assume 150' length; 30" hgt - no

Item No.	Description	Unit	Unit Price	Quantity	Amount	Remarks
						Assume reclamation of exist. pavement to 400' east of intersection; 350' north of intersection; 500' west of intersection; 480' south of intersection; 250' at Town Hall by-pass. New pavement where curb alignment adjusted. ***All Opinion of Costs include costs for baseline improvements***
701	Concrete sidewalk	SY	$42	1,450	$60,900	4" depth w/ scoring and expansion jts - only incidental gravel req'd
706	Unit Pavers at Crosswalks	SY	$250	1,120	$280,000	Cost incl conc. pavers on conc. base
765	Loam and seed	LS	$25,000	1	$25,000	Surface restoration. Incl. Loam borrow, dump, spread, fine-grade, seed and straw mulch. Maintain to establishment
775.032	Shade Tree	EA	$850	10	$8,500	Allowance. 3" - 3 1/2" cal. - installed
815	Traffic signal upgrade	LS	$180,000	1	$180,000	New signal system with loop detectors
820.02	Additional ornamental lights	EA	$4,500	6	$27,000	Allowance for additional lights similar to existing colonial fixture. Installed system cost
832.1	Warning - regulatory & Rte mkr - alum. panel TY. A	SF	$25	150	$3,750	Allowance
859	Reflectorized drums	DD	$0.75	15,000	$11,250	traffic control - 6 month project duration
867	4 inch thermoplastic pavement markings	LS	$8,500	1	$8,500	Allowance
874.2	Traffic sign removed and reset	EA	$250	8	$2,000	Regulatory signs - assume new 5 post and footing. Allowance
999	Police details	HRS	$45	2,000	$90,000	Traffic control over 6 months
	Subtotal				$1,393,835	
	5% Mobilization				$69,692	
	Total				$1,463,527	
	25% Contingency				$365,882	Contingency @ Pre-schematic (master plan) Phase
	Total Opinion of Construction Cost in 2006 dollars				**$1,829,408**	
			Say		**$1.83 mm**	

Item No.	Description	Unit	Unit Price	Quantity	Amount	Remarks
						Assume reclamation of exist. pavement to 400' east of intersection; 350' north of intersection; 500' west of intersection; 480' south of intersection; Town Hall by-pass removed and landscaped. New pavement where curb alignment adjusted. ***All Opinion of Costs include costs for baseline***
	Reverse driveways at Sudbury Commons	LS	$1,500.00	1	$1,500	Signs, pavement markings
	Crosswalk signs	LS	$2,000.00	1	$2,000	Blade signs at Sudbury Center crosswalks
	Driveway openings narrowed at Noyes Sch, Loring Parsonage and drive at Town Hall	EA	$8,300.00	3	$24,900	Demolish/remove excess pavement: $5,500. Fill, finegrade, loam, seed and maintain to establishment: $2,800.
	Baseline lane markings	LF	$1.15	5,700	$6,555	4" thermoplastic - minimum lane and shoulder markings at intersection
	Old Sudbury Road / Concord Road Intersection Improvements					
102.5	Tree protection	LS	$7,500	1	$7,500	
120.1	Unclassified excavation	CY	$25	1,985	$49,625	At areas of demolished sidewalks and pavement removal at Common
120	Earth excavation	CY	$18	810	$14,580	At areas of new pavement over exist lawn
151.01	Gravel Borrow - Type C	CY	$22	725	$15,950	Allowance for 12" gravel under areas of new road pavement. Assume exist gravel at sidewalks is generally acceptable
170	Fine grading & compacting - subgrade areas	SY	$4	4,300	$15,050	Under all new road/sidewalk pavement
201.5	Catch basin- municipal std	EA	$3,500	6	$21,000	Allowance
220	Drainage Structure Adjusted	EA	$350	8	$2,800	Manhole or structure adjusted - Allowance
241.18	18 inch RCP	LF	$50	1,050	$52,500	Allowance
376.3	Hydrant remove & reset	EA	$2,000	2	$4,000	Allowance
358	Gate Boxes/Stops Adjusted	EA	$225	20	$4,500	Allowance
	Pavement reclamation	SY	$25.00	7,620	$190,500	At areas of exist road pavement. Top 18" of material ground, mixed, fine-graded and repaved
460	Class I Bit. Conc. Pavement - Type I-1	Ton	$65.00	380	$24,700	New road pavement at lawn areas. Allowance
504	Granite curb type VA4 straight	LF	$36	4,150	$149,400	Granite curb at edge of road to limit of work, traffic islands and flush edging at crosswalks per MHD std detail
685.1	Field stone masonry wall - dry	CY	$450	170	$76,500	New stone retaining wall at First Parish lawn. Assume 250' length; 48" hgt with rustic granite slab capstone
690.1	Stone masonry wall - dry - removed and rebuilt	CY	$375	75	$28,125	Free-standing stone wall at Grinnell Park - removed and rebuilt. Assume 150' length; 30" hgt - no capstone

Item No.	Description	Unit	Unit Price	Quantity	Amount	Remarks
						Assume reclamation of exist. pavement to 400' east of intersection; 350' north of intersection; 500' west of intersection; 480' south of intersection; Town Hall by-pass removed and landscaped. New pavement where curb alignment adjusted. ***All Opinion of Costs include costs for baseline***
701	Concrete sidewalk	SY	$42	2,135	$89,670	4" depth w/ scoring and expansion jts - only incidental gravel req'd
706	Unit Pavers at Crosswalks	SY	$250	1,120	$280,000	Cost incl conc. pavers on conc. base
765	Loam and seed	LS	$25,000	1	$25,000	Surface restoration. Incl. Loam borrow, dump, spread, fine-grade, seed and straw mulch. Maintain to establishment
775.032	Shade Tree	EA	$850	10	$8,500	Allowance. 3" - 3 1/2" cal. - installed
	Site Improvements at Town Hall	LS	$45,000	1	$45,000	Misc. landscaping, ornamental paving and community notices kiosk
815	Traffic signal upgrade	LS	$180,000	1	$180,000	New signal system with loop detectors
820.02	Additional ornamental lights	EA	$4,500	6	$27,000	Allowance for additional lights similar to existing colonial fixture. Installed system cost
832.1	Warning - regulatory & Rte mkr - alum. panel TY. A	SF	$25	200	$5,000	Allowance
859	Reflectorized drums	DD	$0.75	15,000	$11,250	traffic control - 6 month project duration
867	4 inch thermoplastic pavement markings	LS	$7,500	1	$7,500	Allowance
874.2	Traffic sign removed and reset	EA	$250	8	$2,000	Regulatory signs - assume new P-5 post and footing. Allowance
999	Police details	HRS	$45	2,000	$90,000	Traffic control over 6 months
	Subtotal				$1,462,605	
	5% Mobilization				$73,130	
	Total				$1,535,735	
	25% Contingency				$383,934	Contingency @ Pre-schematic (master plan) Phase
	Total Opinion of Construction Cost in 2006 dollars				**$1,919,669**	
			Say		**$1.92 mm**	

Compilation of Notes from Aerials and Existing Conditions Plan <u>Positive</u>

<u>Comments:</u>

Circulation

- Crosswalk on Old Sudbury Road in front of Flynn Building works
- Residents turn in and out of driveways – short wait time
- Right turn from Old Sudbury Road to Concord Road works
- Parking is hidden behind buildings
- Parking is available behind Town Hall which is adequate most of the time (except for big functions)

Historic and Cultural Heritage

- Heritage Park – great trees
- Picturesque stonewalls
- Nice buildings, historic character, and beautiful churches - these views are important to maintain
- Protect cemetery, but keep the view into it from the road
- Open space at Town Hall

Miscellaneous

- Nice pond on the east side of Concord Road
- Carriage Road is an important buffer
- There are potential economic opportunities at Village Green Shoppes (currently empty) if made more easily assessable. Better accessibility would hopefully allow for retail establishments to be more successful. A facility of this type would be a nice amenity for the town to have in this location.
- Future rail trail could provide potential economic opportunities for the Town Center
- Grinnell Park – open up
- Playfields location in the Town Center

<u>Negative Comments:</u>

Safety

- Town Center is rife with traffic / pedestrian conflicts
- Pedestrian access is limited in Town Center
- Town Center is not handicapped accessible - grade issues, pot holes, inaccessible surfaces
- Integrity of the road surfaces have been compromised – there are holes everywhere
- Many roads in the Town Center have no designated place to walk and the ones that do have sidewalks are not kept up
- Lack of sidewalks on south side of Old Sudbury Road

- No safe way to cross Route 27 – existing crosswalk for people crossing Route 27 from Noyes School is indistinct
- Pedestrian crossing Concord Road (unsafe)
- Crosswalk surface needs to be replaced on Old Sudbury Road in front of Flynn Building
- Crosswalk from corner of Concord and Hudson Roads is very dangerous
- Dangerous to cross Concord Road, the crosswalk in front of Reed House is particularly dangerous since it is hard to see the pedestrians when they are crossing
- Many people drive children that could walk to the Noyes School if area around school was safer for them to cross
- Possible future rail trail crossing at Hudson Road will be an issue
- Crosswalk is located in the wrong place on Concord Road
- Vehicle speed is a problem – traveling too fast through Town Center and in particular south on Concord Road and on the Candy Hill Road cut though
- Bad lighting on triangular island and no marked crossing
- Crossing to the Hosmer House is dangerous at night

Circulation

- New cemetery entrance is a mess
- No access to the soccer field off of Hudson Road
- No turns off of Concord Road onto Route 27
- Difficult turn from eastern side of triangle onto Route 27
- Hard to get out of Peakham Road at rush hour – traffic cues up trying to make the left onto Route 27
- Village Green Shoppes is hard to access and as a result business have failed there – it is currently empty
- Signals – timing is not in the order of events
- Delayed green light is bad – install advanced green arrow
- Poorly timed lights – different needs at different times of the day
- Left turn cycle is too short from Concord Road to Route 27
- Crossing left turn lanes on Old Sudbury Road / Hudson Road
- Enter left lane too early on Hudson Road (traveling east)
- Traveling westbound Old Sudbury Road if you are turning south it is a problem
- Traffic backs up in front of #308 – difficulty turning left out of DW
- Roads are too narrow and vehicles end up driving off the road
- People use three lanes of traffic at Noyes School when traffic stops
- People cut through Town Hall parking lot to avid center Concord Road (traveling south) to Old Sudbury Road (traveling east)
- Tractor trailers have difficulty turning
- Too many trucks on Concord Road (south)
- Not sure how to get around walking (park and school)

Historic and Cultural Heritage

- Upkeep on Town Common could be better
- Town green at the corner of Hudson and Concord Roads is neglected
- Cemetery edge in unprotected from traffic

Miscellaneous

- Need bikeway accommodations along Concord Road
- Bus loading – no cross walk at day care
- Hideous power box at crossroads
- Vehicle size is unregulated in regard to traveling through Town Center
- Too much signage
- No curbs along the roadways
- Utility poles are visible – could utilities be put underground?
- Police activity at intersection
- Lack of parking signs for Heritage Park
- Noise level in Town Center is too high
- Lack of retail/ice cream (specific to Village Green #29 Hudson Road)
- Lack of visibility in center
- Poor advertisements for meetings

Other:

Safety

- Install gaslights
- Remove bituminous concrete walks and replace with brick
- Install needed crosswalks and make them very visible
- Add granite curbs to help contain vehicle traffic to roadways

Circulation

- Could the traffic be routed around the Noyes School? Who owns this land?
- Have vehicle size limits – especially Maynard Road
- Create a cut through Goodman Hill to Route 20
- Protect Town Center – eastbound Hudson Road tuning north
- Review signal timing
- Need stop line on Route 27 east of triangle
- Speed limit should not increase to 40 mph until lined up with inbound sign speed
- Need 15 mph limit to Peakham Road
- Remove Town Hall loop
- Town Hall is a destination, have appropriate signage to direct visitors

Historic and Cultural Heritage

- Designate Old Sudbury Road as a scenic road

- What can the triangle be used for?
- Can they move the Hosmer and Reed houses back from the roadway?
- No land taking at Hosmer House

Miscellaneous

- Connect green spaces
- Aerate pond at Heritage Park
- Regulation signs should be approved by Planning Board
- Suggested pedestrian path from #29 to Candy Hill
- Need planting opportunities - create a Daffodil Trail and planting islands

Compilation of Goals and Objectives Boards

Preserve and protect physical and special elements

- Maintain visual elements
- Avoid encouraging more traffic
- Avoid light pollution with appropriate lighting

Manage and maintain existing open spaces

- Allow for flexible use of open space
- Connect open spaces and integrate with walking paths
- No additional building
- Make sure to coordinate with Rail Trail committee
- Need water access at Grinnell Park for maintaining summer plantings and drinking fountains

Improve traffic flow in Sudbury Center roadways (8 green dots)

- Improve traffic lights – do in phases if it is not economically feasible to do the improvements all at once (2 green dots)
- Main problem is cross left turns on Route 27
- Redo road surface at center with colorful bricks to slow traffic and highlight center
- If you increase capacity they will come (1 black dot)
- Town should control Route 27 in Center

Improve "walkability" in Sudbury Center (5 green dots)

- Improve "bikability" in Sudbury Center
- Add destinations (4 green dots)
- Make sure destinations are connected
- Sudbury walking trail
- Kids need crossing guards at all major road crossings! (3 green dots)
- Cycle-ability – town does not provide bussing for children who live less than two miles from the school (3 green dots)
- Aesthetically pleasing sidewalks (i.e. brick)

Preserve Sudbury Center's visual character (4 green dots)

- Repair the edges of roads and streets
- Landscape enhancements – planters on triangle
- Improve appearance of Town Common
- Remove asphalt in front of town hall and use as part of History Trail
- Make more tourist friendly by adding signage and creating a history trail (1 green dot)
- Make town center a center for town programs/activities – ex. Summer concerts, festivals, theater (comment on the side that the school has these facilities) (1 green dot)
- Preserve opportunities for planting islands/edges/pocket gardens (5 green dots)