



Development of Land Use and Infrastructure Alternatives EAST HARWICH VILLAGE INITIATIVE REPORT



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The Town of Harwich

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The commercial district located around the intersection of Routes 39 and 137 in East Harwich is undergoing rapid development without the benefit of a village plan. As a result, the dominant development pattern consists of freestanding, single story commercial structures with multiple curb cuts that do not engender a pedestrian accessible village identity and do not address workforce housing needs. Significant additional development potential exists in the area, including the expansion or additional development of regional attractions including retailers, supermarket and cinema. It is probable that the significant additional development potential within the commercial district would follow that same pattern without changes in regulation, policy and infrastructure supported by a community-based plan.

Additionally, the commercial area is surrounded on three sides by large tracts of undeveloped land that have the potential to support frontage access roads needed to relieve traffic pressure on the intersection, as well as badly needed work force housing. Planning for these undeveloped lands needs to be coordinated with planning for the commercial district to ensure that the areas complement each other and provide opportunities for compact development with appropriate offsets and an effective transition zone to nearby single-family residential areas. The Initiative will be designed to ensure that land use analyses encompass select undeveloped parcels outside of the CH2 district facing development pressure.

Over the past decade the area has experienced significant development activity. Development is not occurring in a fashion that promotes a village identity, provides meaningful pedestrian connections, or addresses the Town's need for workforce housing. There is a high potential for the area to develop with continuous curb cuts and increasing traffic signalization.

In June 2005 the East Harwich Community Association (EHCA) sponsored a public vision forum for the East Harwich Village Center. The forum was well attended by area residents and business owners, Town officials and representatives of the Association to Preserve Cape Cod (APCC), the Business Roundtable, and the Cape Cod Commission. Forum participants reviewed current conditions; explored community perspectives on the issues outlined above, and helped to coalesce the need for comprehensive planning for the village center.

Subsequent to the forum the Town, in collaboration with the EHCA, Cape Cod Commission and APCC/Business Roundtable, obtained a grant for the first phase of the East Harwich Village Center Initiative from the Barnstable County Regional Economic Development Pilot Project (REDPP). The East Harwich Village Center initiative affords the Town an opportunity to address the future of the commercial district and surrounding undeveloped lands through the design and implementation of a vision and land use and infrastructure plan that is developed through an open public process. The Initiative is a collaboration involving the Town of Harwich, East Harwich Community Association (a private, non-profit community organization), Cape Cod Commission (regional planning agency) and the Association to Preserve Cape Cod (APCC)/Business Roundtable (regional non-profit organization).

The first phase of the Initiative, described in this report, was to develop land use and infrastructure alternatives for the commercial district and surrounding area. Four public forums were held to engage the community in an open discussion about their preferences for the area as well as their issues with the potential impacts of increased development. The community has been working to develop a vision that balances the EHVC's position as a regional shopping destination with a desire among area residents for a pedestrian friendly mixed-use center that includes more "home grown", small-scale retailers, services and restaurants. Put another way, this vision would allow limited regional retail growth and promote infill with more village oriented commercial activity, and housing.

East Harwich is a neighborhood that has experienced change.

The neighborhood has been a quiet and pretty side of Cape Cod, but past highway construction provided improved access, new families made this area their home, and new businesses found a market. The result is that East Harwich is now a center of activity with the need for local road improvements and traffic lights, more residents looking for homes and more businesses finding success. As this change occurs there are greater demands put on the infrastructure and the natural resources that made this area special.

Just as importantly, there is the potential to lose the values that made this place special in the first place and the potential lose opportunities still available. New commercial and residential growth is not only predicted, but it is significantly large. The market for commercial space could more than double what is there now. The construction of new homes could continue apace for many years to come, even with the groundwater and environmental restrictions in place.

What can be done?

Luckily, the full build out of this neighborhood has not yet been completed and the changes are not yet final. Significant areas of open space land remain. About 316 acres of open space land zoned residential lie around the commercial village center. The potential for significant new commercial space remains. About 40 acres of land within the commercial center remain open, and the land that has been developed has not been fully built out as allowed under the existing zoning. Change will still occur. However, it should now be guided by the best ideas for a village center that the town can agree on.

This report presents findings and recommendations for the East Har-

wich Village center and surrounding area. The process by which these ideas have been generated has been one of discovery and analysis that leads to a clearly different direction from the original CH-2 zoning, yet works within the existing topology of spaces and land uses. This direction is designed to re-establish a village without losing the economic growth needed to support the community and the neighborhood, and without losing the natural resources that have supported previous development and make this place special.

The concept will require continued planning and implementation over the long term as development and redevelopment occurs within the district, as public infrastructure improvements are advanced, and as new ways are found to improve the district.

So the recommendations are...

To maintain the overall concept of the village center over the long term, the plan is first focused by a set of guiding principles that frame the outcomes from both the public and private perspectives. The specific ideas that follow the guiding principles are an attempt to implement these goals. However, the community does not fully control all of the land in question and new public needs and demands may arise over the longer term. For these reasons, the guiding principles are set for future planners to refer back to and understand that when alterations of the plans are necessary, this connected string of ideas should remain binding and direct those plans.

1. Introduction: Smart Growth and Sustainable Growth

Guiding Principles for East Harwich

1. Keep it Green

Open and green spaces define Cape Cod and should be included in any definition of East Harwich.

Not only should the areas of open space provided in the three designated open space parcels be preserved, they should be enhanced. In addition, the town should consider leveraging these spaces for connecting and adding other open spaces and ways to meet the other guiding principles. The addition of new green spaces is paramount, but these new spaces must be functional or valuable in terms of the commercial project designs and relief in the residential areas. The keys to achieving this principle will be to use a Transfer of Development Rights option for compacting the footprint of residential units into the CH-2 district thereby freeing up extensive land areas in the outlying areas.

2. Relate to the Pedestrian

The village neighborhood should not only allow but encourage walking.

The speed of traffic seems to be indicative of the speed of land use changes. The community is looking to manage both so that the village is safe and enjoyable for walking and by extension for biking. This means new [and older] commercial and residential uses should be clumped together with pedestrian connections between them. This will require changes in the land use designations, changes in the zoning dimensional standards and a different course of investment in the individual properties.

3. First Reuse and Redevelop

Expansion of commercial uses is not desired without benefits and offsets to the neighborhood and to the town.

The desired approach is to redevelop older properties and update existing development to meet the new design guidelines and directives. The commercial development in the CH-2 zone has not always been of the character desired by the community, and has been inefficient in how it has used the land developed. This inefficiency means more sprawl and less value as a business and a tax benefit to the town.

4. Compact Development

Pull development into the village center instead of allowing it to sprawl into adjacent open space.

By encouraging mixed use and multi-family residential development within the existing CH-2 zone several goals could be realized. The goals would be to increase the affordable housing units within Harwich, and to transfer single-family development potential out of the adjoining undeveloped land in the Six Ponds DCPC and into the CH-2 district where they can be better managed.

5. Provide Offsets and Match the Carrying Capacity

Do not overburden existing infrastructure and the environment, particularly groundwater and wastewater.

Impacts to wastewater, traffic, and open space should be mitigated by offsets within or outside the district. This can be accomplished with consolidated wastewater and water systems mandated by the community and managed by the landowners. This will be accomplished by creating enough flow to support a combined system through the compacting of development into the CH-2 district.

6. Improve the Access

To use the land most efficiently and with the least impact, carefully design new access ways that serve the kind of development desired.

Improve the pedestrian and bicycle components of the infrastructure. Build new access to relieve traffic congestion and provide multiple access points for residential and commercial development. Safety, comfort, and limited impact will be the concepts used to guide the context-sensitive designs of access ways.

7. Retain Cape Cod Character

Adopt design guidelines that define a local tradition.

Visual clues along the street and within public spaces should reinforce the village concept. Trees provide multiple benefits including character, relief, and weather/temperature mitigation. They should become a significant element. A one-size-fits-all standard will not create the desired image. Uniqueness and variety are desired, as well as multiple owners/developers involved in the project.

8. Make it Green

Sustainable designs help both the district and the community as a whole.

Visible elements of Green Building and Low Impact Development standards; such as green roofs and water gardens, are seen as not only acceptable but desirable. Consider nitrogen reduction and "carbon neutral" as project goals. Nitrogen reduction will occur after combining and treating the effluent streams in the CH-2 district. Carbon neutral previously meant replacing trees lost from a project. It now requires a more elegant approach with reduced energy use, reduced travel and possible 'carbon taxes' to help defray the costs associated with maintaining a sustainable community. The open space attained with the recommended TDR approach could be used to attain an Integrated Sustainability Approach, where natural materials grown and harvested from the open space could be used to support the development within the CH-2 district. The special performance standards (see

sidebar) can be adopted to promote better sustainability.

And the results should be...

The results of applying these guiding principles and developing implementing standards to the village district are threefold and should establish:

A Desirable Character: Establish the basis for creating a future village center that meets multiple goals of Tradition and Quality of Life, in character with the ways Harwich perceives this part of its community;

A Better Way of Growing: Many of the Smart Growth concepts, such as compact, walkable, and low impact development supported with Environment-Improving Infrastructure can and should be applied to the program of changes;

A Legacy: Incorporating the concepts of Sustainability into every facet of the project, including environmentally benign designs, environmental restoration, and a long-term reduction in energy demand.

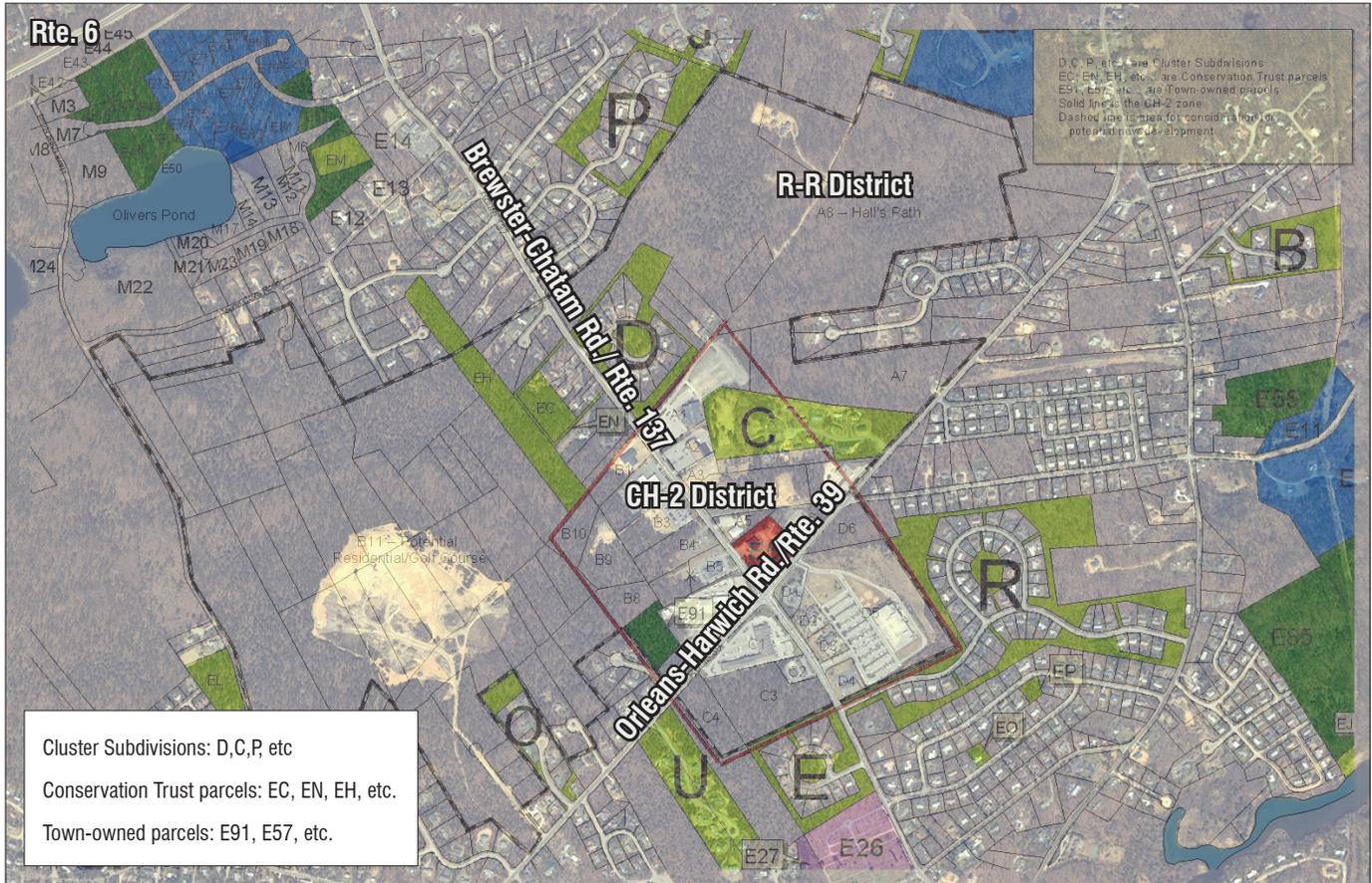
The next parts of this report review the background ideas and findings that helped advance these concepts, defines the alternatives and preferred concept that came out of the process, and recommends certain steps for implementation of the ideas.

Living Village Performance Standards:

- *Limits to growth;*
- *Land balance exchange;*
- *Net-zero energy;*
- *Combined utility and energy systems;*
- *Education and inspiration;*
- *Carbon footprint balance.*

see Sustainability on pg. 26

Figure 1 Study Area and Districts



One possible future



Initial Analysis and Definition

This project started with an analysis of the existing conditions found at the East Harwich village district and surrounding area. The landform is typical of the mid-Cape region with very gently rolling topography and marginal vegetation found in coastal regimes.

The key zoning district that defines the center is the Commercial-Highway 2, or CH-2 district that outlines the commercial center. Outside of the district but included within the study area is the Residential-Rural Estate, or R-R zoning district. Figure 1 shows the study area and districts.

The historical development of the land for the most part is very recent instigated by the Mid-Cape Highway [Route 6] access and zoning designations. One project that did not conform exactly with the district designations is the Carriage Estates project, which is a single family subdivision starting in the residential district on Route 137 and extending into the CH-2 district. This is unique in that single-family units are not allowed in the CH-2 district. Otherwise the CH-2 district is strictly commercial development at present.

The principal streets providing access to the district are Orleans-Harwich Road or Route 39 and Brewster-Chatham Road or Route 137, which are important arterials providing regional access. The important improvements to the roads were the regional connection provided by the Route 6 interchange, and the signalization of the intersection of Routes 137 and 39 right in the middle of the district.

Understanding the Context

Harwich is a fairly recent village and so does not have some of the historical flavor afforded to the other village centers in Harwich and the region. Some of the nineteenth and early twentieth century buildings that

provide some distinction to other village centers are missing here in East Harwich. In addition, the major intersecting roads have been constructed according to more recent engineering standards rather than the early settlement examples. Consequently these roads are not curvilinear, topographically challenged, or tree lined to any significant extent in the way that characterizes the older cart paths, which developed into the regions major roads. These major elements of character, which are used to distinguish older commercial centers, must be recreated, or a new form of development must be established.

The commercial district is also a distinctly different its configuration of zoning. Figure 2: Village Center Comparison shows how the dimensions of the CH-2 district covering East Harwich are very different from these older commercial centers. Some striking differences are:

- The total land area of the CH-2 district is more similar in area to downtown Hyannis, than to the main commercial districts in Falmouth or Provincetown.
- The length of the main roads within the district is also more similar to the length of Main Street Hyannis than to the smaller, yet still viable, historic central business centers in the other communities.

These dimensions also create a district that expands beyond the typical dimensions used when creating a walkable district. The recommended walking dimensions are:

- 300 feet - maximum distance between parking and building [source: Town Zoning Bylaw]
- 300 feet - distance for the side of a block within a traditional neighborhood layout [source: Congress for New Urbanism recommendation]

2. Creating Concepts for a New Direction

VILLAGE CENTER COMPARISON



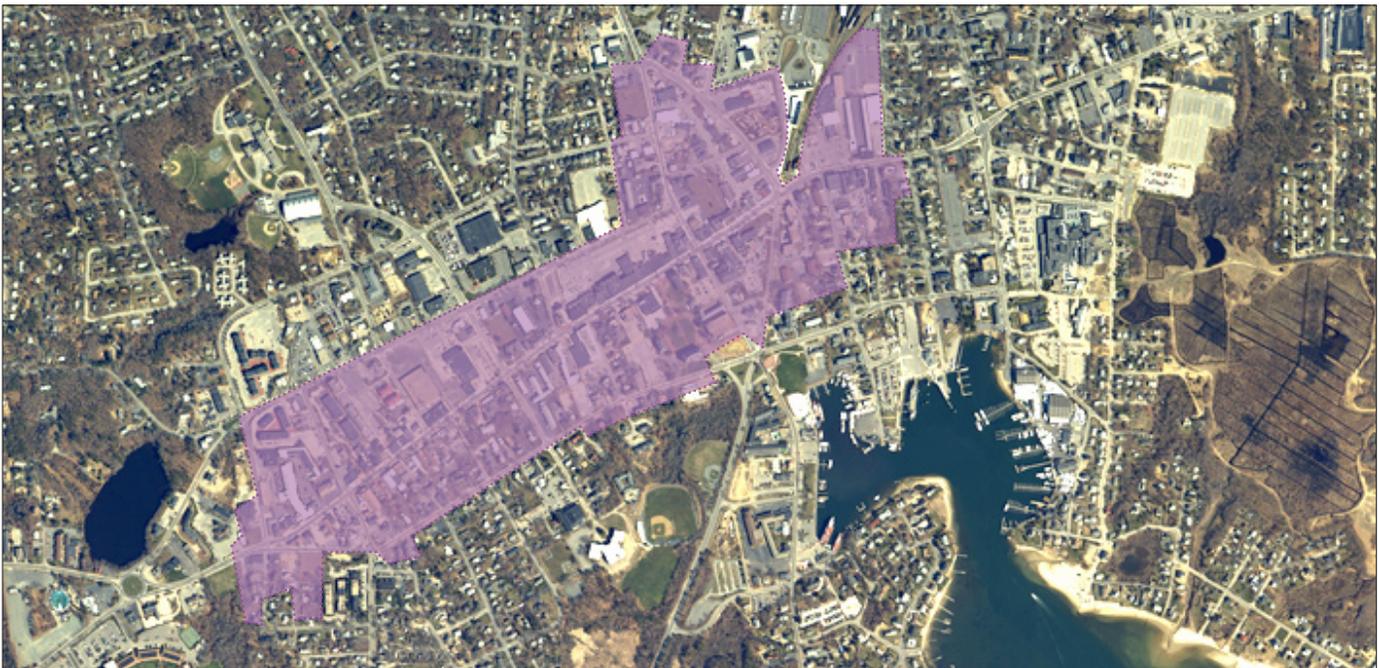
Falmouth



Provincetown



East Harwich



Hyannis



Note: Shaded areas denote commercial zoning for central business district

- 1200 feet - width of district for walking distance between related uses and transportation [source: Transit Oriented Development standards]

However, the CH-2 district measures about 1800 feet east to west and 2700 feet north to south, much larger than the above guidelines suggest as a single locus.

Consequently, the subject of this study maintains a unique position among the village centers of Cape Cod, with aspects that suggest a unique approach is needed to re-direct its future growth to meet the goals and directives established in this study.

Understanding the Zoning Potential

Primarily based on the zoning designations, the area has developed with separate commercial and residential development. However, as can be discerned from the aerial photograph, see Figure 1: Study Area, much of the residential area remains undeveloped as yet.

To better understand the relationship between zoning and the project area, the study created a maximum building scenario in both a spreadsheet and a graphic plan. The spreadsheet lists the existing building square footage, and the maximum square footage allowed by zoning. The analysis also includes the amount of developable land for each parcel as dictated by the percentage of land coverage remaining after excluding the building footprint. Additional information included parking requirements in relation to space available. In addition to the spreadsheet, a graphic representation of the results was prepared. The results are included in the Reference: Background and Analyses.

Working together, the studies told a clear story; East Harwich Village Center has developed less than half of the maximum permissible square

footage allowed under current zoning. When this information is combined with the initial economic analysis, a clear picture of a 'destination' retail center emerges.

By zoning, this area could support up to 1.2 million square feet of commercial space, with stores ranging in size from the small to the large. While the market could capture businesses to fill this amount of space, the success of the commercial district would depend on the other commercial areas in the region. Still, the amount of existing commercial space in the CH-2 district has created an attraction and businesses such as the grocery store and the rug dealer are now successful because they serve a market area much broader than the neighborhood.

The zoning bylaw also permits approximately 403 bedrooms that could be built in the CH-2 district. However, allowing this special residential use has not resulted in construction of units. Additional incentives may be necessary to obtain this broader mix of uses, which are discussed in this study.

There are also overlay zoning districts that add additional criteria for development. Review of those overlay zoning districts also adds an interesting twist to the potential buildout.

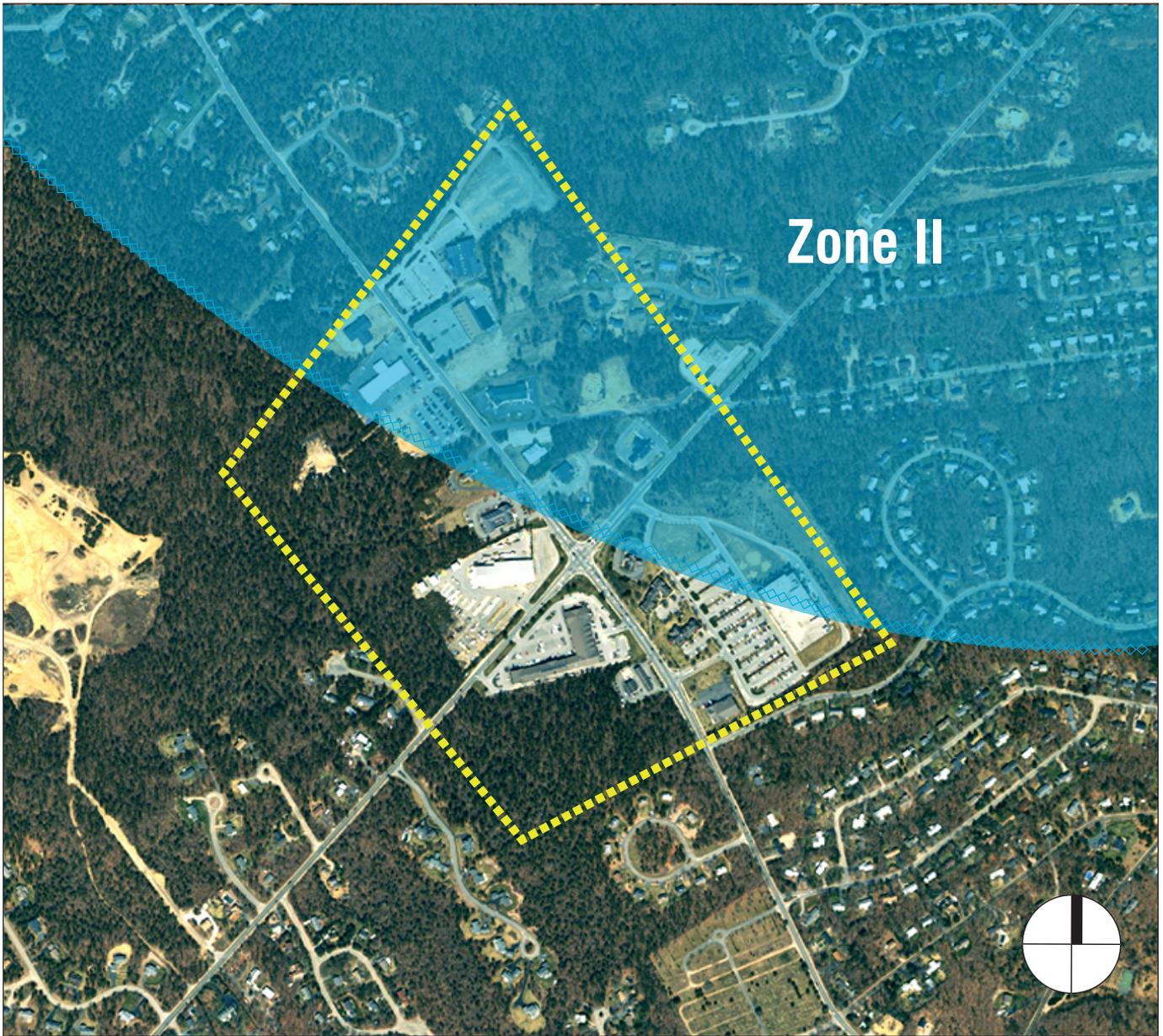
One overlay district is the Water Resources Protection District, which is shown on the Town zoning maps, see figure: Water Resource Protection District. Associated with the WRPD is the Zone II boundary, also shown on the Town zoning maps. While this Zone II district reportedly does not match the actual contributing area of water recharge, it nevertheless remains as a local designation with associated zoning restrictions.

The other possibly more significant overlay zone is the Six Ponds District, which covers the residential and commercial districts in the northwestern quadrant of the study area, see Figure: Six Ponds District. This district applies significant restrictions to the



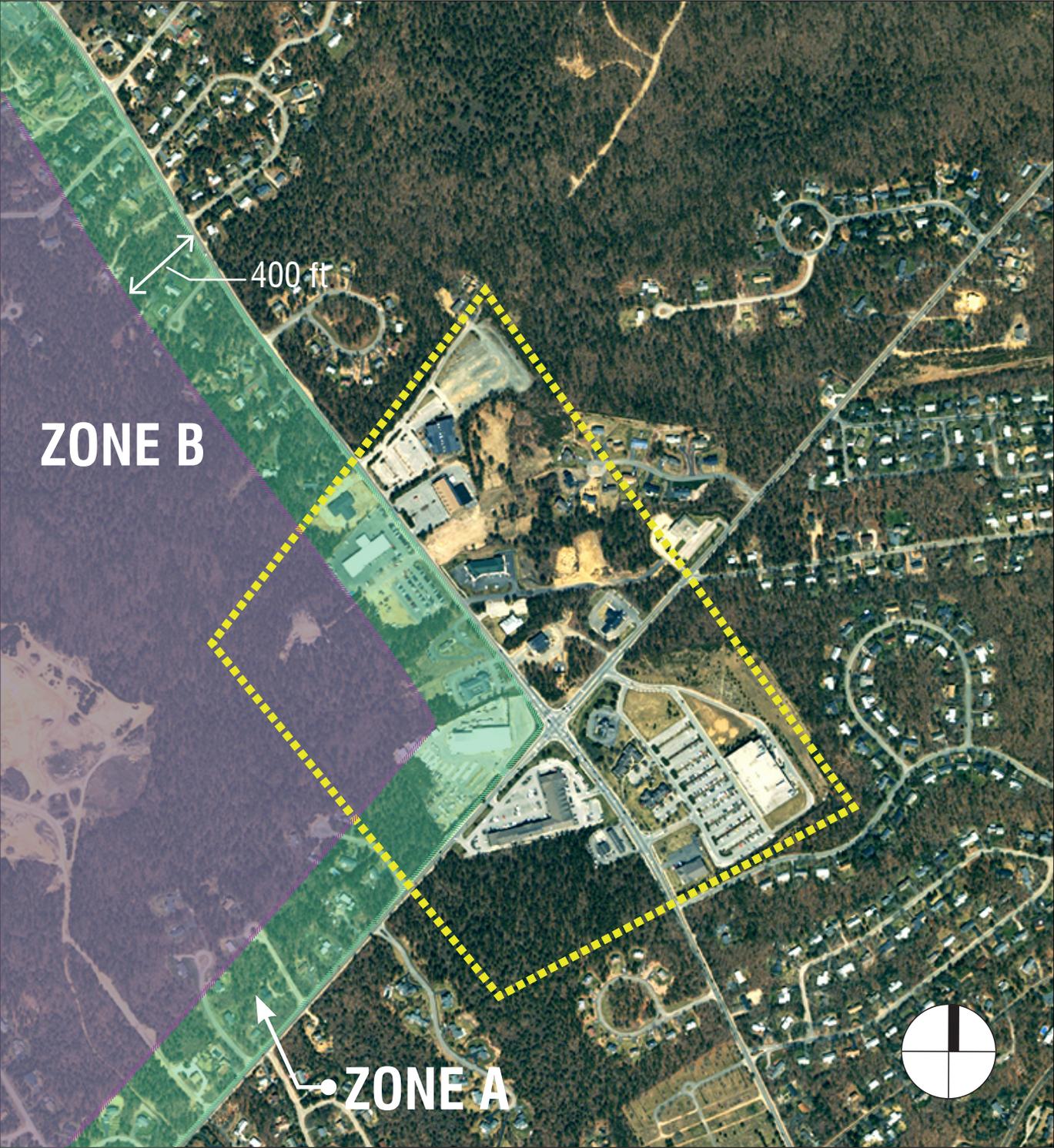
Ch-2 District superimposed with a 300' grid:

WATER RESOURCE PROTECTION DISTRICTS



Note: All areas shown are in the Water Resource Protection District

SIX PONDS DISTRICT



development of residential units, raising the minimum lot area to 60,000 square feet [Zone A] and 100,000 square feet [Zone B], thereby restricting residential development above what is allowed in the underlying zoning [40,000 square feet per lot], and restricting commercial development by reducing the allowed building coverage by two-thirds [10% in the Six Ponds District versus 30% in the CH-2 district].

Understanding the Infrastructure

Without infrastructure the land in this area could not be developed. The important access ways are Orleans-Harwich Road or Route 39 and the Brewster-Chatham Road or Route 137, which link this site to the region, the sandy soils allow on-site septic systems that treat wastewater, and the town has a water supply that feeds the CH-2 district. However, there have been impacts.

Thirty-six years ago, in 1970, there were 1,950 vehicles that passed through the main intersection during a four-hour period. Today there are about 22,000 that pass through daily. As may be expected, recent reports are that the roadways have been severely crowded during peak times. Recent mitigation includes the new traffic signalization and turning lanes added at the intersection.

There is still more to come. The Cape Cod Commission projected 2,700 to 3,300 new trips in the peak hour after full buildout of the CH-2 district, which would more than double the number of existing peak hour trips at about 2,600 cars and trucks, which were counted at the time of the study (CH-2 Planning Study, May 1999). Although a series of land use changes have altered the potential buildout, these estimations of change are still significant.

Existing Traffic: 22,000 vehicles per day

Potential Traffic: 47,000 vehicles per day

In similar fashion, the existing wastewater discharges, which are all standard Title 5 systems with the exception of the Stop & Shop treatment facility and a denitrifying system for the 400 Restaurant, are also projected to about double in flows.

Existing Flows: 53,800 gallons per day

Potential Flows: 106,000 gallons per day

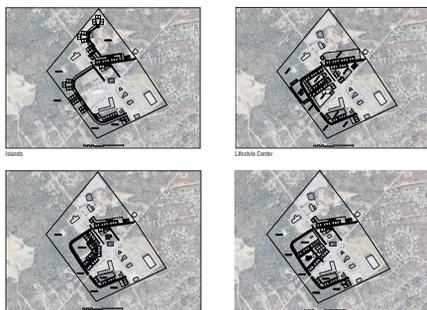
Managing the growth of East Harwich means mitigating the impacts of these potential changes. There are several ways to accomplish this with mixed-use, pedestrian-oriented development that is included under an umbrella of water and traffic management authorities.

The Process for Creating Concepts for a New Direction

Based on the initial understanding of the study area, alternative plans to grow in better ways were created to allow a discussion of different approaches to growth. The planning concepts that have evolved in this came from a process that at times involved the study team, the Steering Committee, people who could attend the public meetings, and the comments received in Town Hall.

The process began with an examination of the existing conditions and their relationship to the current regulatory framework (see Reference: Background and Analyses). The findings during this process were then linked to the goals of the community as determined by the public meetings. The study team then created initial concept diagrams which highlighted those goals and the conditions of the site. Upon review of the concepts, the study team returned to the boards to further advance the ideas and layout plans.

These concept plans took four shapes; Lifestyle Center, Main Street, Side Street, and Campus Plan. Each had particular design considerations and were organized to a different hierarchy of concerns. Upon Steering Committee review, the concepts were



Initial Development Scenarios

presented at a public meeting where attendees were asked to respond and comment on the proposals and then, working in groups, develop a plan based on their own priorities and understanding of the community. Review of these comments and diagrams suggest a path for future village development. The future step is refinement of the ideas and implementation through the primary local powers of zoning, infrastructure and design guidelines, and capital improvements.

Concept diagrams

With the program solidified, the project team prepared four design approaches satisfying the requirements: Side Roads, Main Street, Campus Quadrangle, and Lifestyle Center. The key concepts created separately for each of these approaches were:

Side Roads (Figure 5)

The Side Roads concept resulted from trying to address the demands of the large size of this district. Split by the major arterial roads, the large area (note comparison to other town centers) requires thought about how people will move through to the ends of the district.

The planning area has been previously broken out into ‘quadrants’ divided north-south and east-west by Routes 137 and 39. In addition, the idea of this location being a part of the regional amenities and visiting spots, such as Downtown Harwich, the beaches, the trails, and other features suggested that one way to consider the area is as a series of islands, pavilions, or venues that can be connected by trolleys, bikes, and cars, because all of these locations are beyond typical walking distances. This allows each of these pavilions to be an enclave of certain possibly related activities and uses that create smaller shopping districts. Each pavilion could be organized strictly for a walking environment with amenities related to bikes and pedestrians and more restrictive for vehicles.

The key aspects of this design concept are presented as:

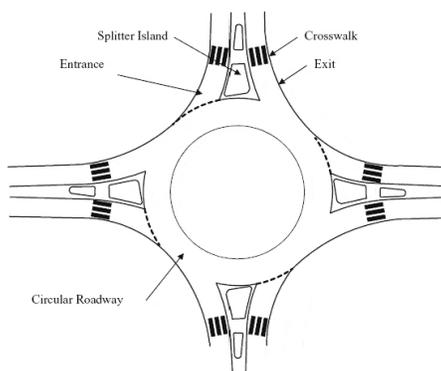
- New loop roads are provided to open locked parcels to vehicular access and to connect the whole district with multi-modal access, outside of the main roads.
- “Pavilions” of commercial developments ranging from 20,000 SF to 30,000 SF are spotted along

Figure 5: Side Roads concept



the loop road at similar intervals with the idea that the nodes can be reached by vehicles, bicycles or pedestrians, but there is some less developed relief between the pavilions.

- The combined greenway/walkway/bike path provides safe, efficient access between pavilions to provide choices for movement.
- Development is proposed or controlled to only those areas deemed likely to change, therefore suggesting zoning district changes.
- Relocation of the fire station is proposed to move the station out from the potentially greater congestion of the main intersection.
- This concept adds another island, a round-about in the main intersection.



Standard Round-about

Main Street (Figure 6)

The Main Street concept is one that advances more traditional ideas of villages and town centers. However, in this case, the width of the area requires a series of blocks, or intersecting 'main' streets that create blocks, to allow the whole CH-2 area to be used according to the underlying zoning.

The goal of Main Street is an area that looks and acts as a highly active center generating a high level of passing traffic that can be related to increased sales in the adjoining stores and for the service providers. Because main streets are most often linear and defined by the street, the layout of the 'main' street(s) becomes an important factor in the decision-making for the overall plan. The buildings can create the street frontage and hide the parking in the rear. Common parking areas and shared parking can be easily accommodated. Fully accessible pedestrian links and direct access to the commercial entrances are also part of the development concepts.

The key aspects of this design concept are:

- A two-way 'main' street with two lanes in each direction is created in the northwestern quadrant, since this is considered the most likely quadrant for significant change. The 'main' street is smaller in dimension than the major highways and adds substantial frontage for pedestrian activities.
- Buildings and improvements are located close to the highways to hold the edges of Routes 137 and 39. However, the buildings also frame up the new 'main' street and so require multiple fronts to relate to all sides of potential public activity.
- Limited street parking is provided to create a level of activity along the street. This must be done carefully to avoid conflicts with pedestrian crossings.
- Combined parking lots, with shared parking are located behind the mixed use, commercial buildings.
- A new loop road throughout the district is provided to open locked parcels to vehicular access and to connect the whole district with multi-modal access.
- Relocation of the fire station is proposed to move the station out from the potentially greater congestion of the main intersection.
- A landmark is proposed in place of fire station and on the adjacent public land as a town center green.

Campus Quadrangle (Figure 7)

This particular concept may appear unusual as a land use proposal. However, the idea of a campus-like setting within a community center is actually historic in its precedent. Early town center plans almost always included

Figure 6: Main Street concept plan



Figure 7: Campus Quadrangle concept plan



a village green that defined the center. The historic uses of these greens varied but were typically a functional element of the center.

The Campus Quadrangle proposes a green within the center of the mixed use and commercial development as the locus of activity, which is fully accessible from all buildings

and becomes the cross connection between stores, services and other uses allowed in the district. The center green softens the front entrances to the surrounding buildings and can become a space for events, which may be programmed or spontaneous. The size of the space could vary from one-half acre to two acres

in size depending on the number of buildings and uses that surround the space, and what parcels are combined to create the setting.

The key aspects of this design concept are:

- The main development project is arranged around a central green space of one-half to two acres in size. Vehicular access is very limited within the green space and mostly relegated to the rear of the buildings.
- The remainder of intensive new development and access is focused at the intersection of Routes 137 and 39.
- A new loop road throughout the CH-2 district is provided to open locked parcels to vehicular access and to connect the whole district with multi-modal access.
- Relocation of the fire station is proposed to move the station out from the potentially greater congestion of the main intersection.
- A landmark is proposed in place of fire station and on the adjacent public land as a town center green.

Lifestyle Center (Figure 8)

A definition of a lifestyle center is “a mixed-use center that creates a compact live/work/shop/play environment, and provides a modernized version of a traditional marketplace with the character and ambience of a small town center.” Uses may include in-demand retailers, boutiques, specialty shops, restaurants, entertainment and personal services. This development would be privately owned, and create an environment that supports commercial activity. The nearest successful example of a lifestyle center is Mashpee Commons.

As noted in the background analysis (see Reference: Background Analysis), retailers are partial to this type of development because of the anticipated higher value sales expected based on the popularity of these attractive shopping environments. Consequently, evolution of such a center starts with commercial development and then leads to other elements in the mix of uses.

The key aspects of this design concept are:

Figure 8: Lifestyle Center concept plan



- The majority of development is commercial uses, designed and grouped together for easy, attractive pedestrian access connecting to all of the commercial spaces relying on pedestrian traffic. Development is also positioned to hold the edge of Route 137 in the diagram.
- Limited street parking is provided to create a level of activity along the main access ways. Although potentially private streets, this access will act as a typical public street.
- Combined parking lots, with shared parking are located behind the mixed use, commercial buildings.
- A new loop road throughout the CH-2 district is provided to open locked parcels to vehicular access and to connect the whole district with multi-modal access.
- Relocation of the fire station is proposed to move the station out from the potentially greater congestion of the main intersection and to allow the land to be redeveloped for private commercial development.

These concept layout plans were presented to the Steering Committee whose comments were incorporated into a second round of scenarios. The second round brought further detail to the plans including the location and type of housing and proposed street sections. The plan most altered by the comments was the Islands plan. This plan became a clearinghouse for ideas, showcasing innovative circulation and environmental concepts. These concepts include a one-way frontage road between the commercial storefronts and the highways. The frontage road is flanked by angle parking along the highway side forming a buffer between the speed of the highway and the speed of the pedestrians, and a shared use path on the other.

What Was Learned

While the concept plans had many similarities and presented some ideas that suggested a very different direction for growth, the most important lessons learned from the exercise were what the public participants thought were the best ideas – and worst. The summary of the October public meeting is included in Reference: Understanding Public Comment. The important issues in order of importance were:

- Greening the area and improving the open space
- Making the district walkable and worth walking across
- Including residential development in the mix, and
- Constructing the additional roads that create blocks.
- Civic uses, vehicles, bike paths, and a rotary were all given less weight or importance in the mix of comments

What this information points to is that people are looking primarily for a ‘green’ village, with usable open space, and a walkable center. This directs the plan to lower vehicle use in favor of a less dense and more pleasant pedestrian-focused center. Interestingly, the ideas of moving towards more residential development and laying in the additional access to create blocks ranked second in importance.

3. The Resulting Alternative

There are alternative scenarios for buildout of this area, akin to the existing patterns of change. An example has been chosen here to illustrate one such possible future. This will be described, but the important idea is to advance recommended changes to local structural, regulatory, and management programs that will manage any new growth. These actions will require interagency, intra-agency and public-private partnerships because of their complexity.

Changes in the districts, quadrants and infrastructure are each recommended and describe the Resulting Alternative according to the Guiding Principles as outlined here. The resulting Building Program is summarized and further described in Reference: Building Program.

Land Use

Currently the CH-2 district covers a significant area of land, as noted previously. The area of the CH-2 district is 122 acres as listed in the Assessors' database, but is scaled from the

GIS system as 126 acres. The numbers used here utilized the scaled area of 126 acres.

I. Overall \ Modifications

The Core Districts

The total area of the most intensive commercial and mixed use development possible in the CH-2 district is proposed to be reduced to about 53 acres, which covers the southeast quadrant and the properties closest to the main intersection of Routes 137 and 39. This is called the Core district. Within this area are the most intensive recent developments of Stop & Shop, the plaza with the 400 Restaurant, the opposite corner with the CVS pharmacy, and the projects across Route 137.

This follows the Guiding Principle of Reuse and Redevelop First.

The mix of uses would be the same as allowed in the Transitional Districts, but the focus would be on first floor retail uses with offices and residential units relegated to the second and higher floors. A higher volume of building area, such as going up the maximum of 2.5 stories, would create a density that would improve the level of activity between buildings and uses.

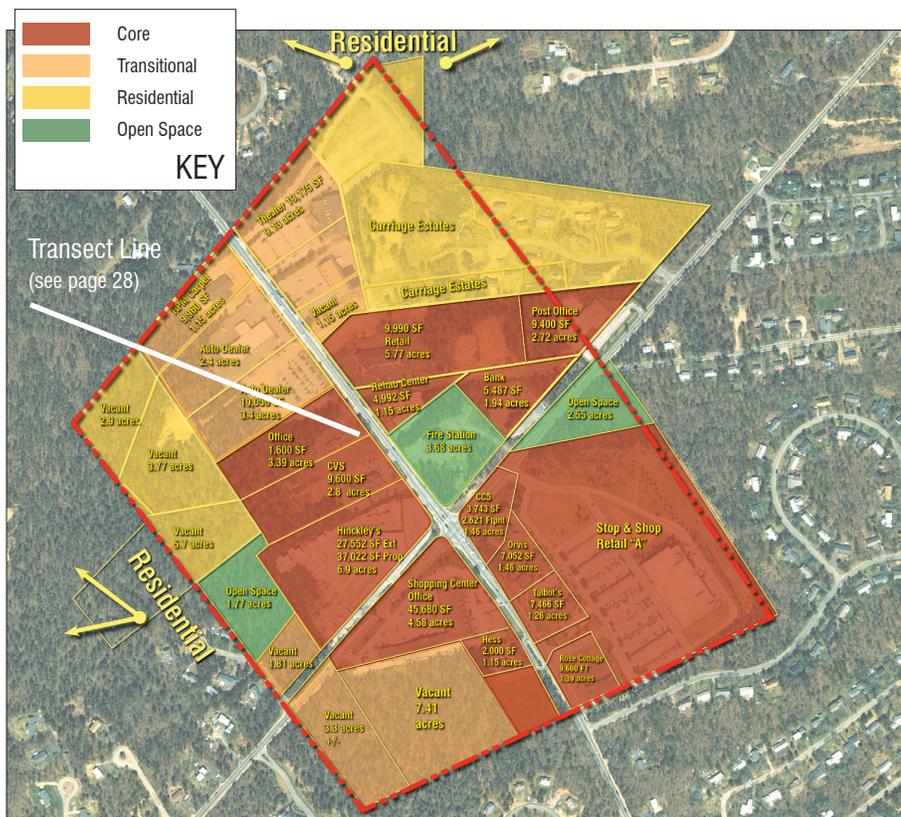
This follows the Guiding Principles of Compact Development, Relate to the Pedestrian, and Retain a Cape Cod Character.

Current building coverage allowances are 80% in the Village Commercial Overlay district covering downtown but only 30% in the CH-2 district. While the intent is not to create a competing historic village center, an increase in allowed coverage will allow more compact development within the Core District.

This follows the Guiding Principle of Compact Development.

The existing open space areas would remain and must be improved and

Land Use Overlay



integrated into any new development projects, not solely as buffers but as active and passive use areas that help create the walkable district recommended. Existing roads would be the primary corridors for movement with new private roads providing interior access.

This follows the Guiding Principles of Make it Green, Relate to the Pedestrian, and Improve the Access.

Transitional Districts

The Transitional Districts follow recognition that the total development potential of the district must be in line with the supporting infrastructure and the capital available to improve the infrastructure. These districts are a subset of the commercial area and cover approximately 30 acres of the CH-2 district.

This follows the Guiding Principle of Provide Offsets and Match the Carrying Capacity.

The mix of uses would be the same as allowed in the Core Districts, but the offices and residential units would not be relegated to the second and higher floors and could exist as stand-alone buildings. A higher volume of building area, such as going up the maximum of 2.5 stories, would

also be promoted to create a density that would improve the level of activity between buildings and uses. However, the total coverage would not be increased to allow the transition to the adjoining neighborhoods.

This follows the Guiding Principles of Compact Development, Relate to the Pedestrian, and Retain a Cape Cod Character.

The existing open space area would remain and might be improved to integrate it with any new development projects and to potentially allow access ways and utility corridors. Access would be improved with both existing roads and new paths and road systems. Additional green space would be required to meet the zoning requirements for each project.

This follows the Guiding Principles of Make it Green, Relate to the Pedestrian, and Improve the Access.

Residential Districts

The Residential Districts cover approximately 35 acres. This includes the land already committed to the Carriage Estates single-family subdivision of approximately 16 acres. The residential units allowed in these districts would expand the allowed uses under the current CH-2 zoning.

Core/Transition



- Cluster
- Provide pedestrian access
- Parking nearby
- Small Scale
- Housing/Offices Above
- Work toward Shared Parking

Residential



- Provide low income component
- Walking access to commercial areas
- Variety in styles, density, and proximity to street edge

This follows the Guiding Principles of Compact Development, Relate to the Pedestrian, and Retain a Cape Cod Character.

Calculated development density under the restrictions of the Six Ponds overlay district and the CH-2 zoning designation for Apartments Incidental to Commercial allow that approximately six to nine units per acre would be possible. However, the CH-2 district does not allow stand alone residential except for two-family units. The residential units proposed in this concept would require additional allowances for multi-family unit types.

This follows the Guiding Principle of Compact Development.

The clustering of residential units and the transfer of development potential from the surrounding residential districts into the CH-2 Residential Dis-

tricts would help maintain open space outside the former CH-2 district.

This follows the Guiding Principles of Compact Development, and Make it Green.

Open Space Areas

The eight acres of open space in the three lots that exist today are retained under this land use plan. However, new, usable open space areas are to be required with the changes made in the other districts so it is expected that the open spaces will increase. In addition, if the transfer of development rights is successful, or under cluster subdivisions, the existing R-R residential districts outside the CH-2 district will create more open space areas. The key will be to ensure that these open space areas are connected and available to create paths and links between all of the areas.

This follows the Guiding Principles of Make it Green, Compact Development, Relate to the Pedestrian, and Retain a Cape Cod Character.

The summary of all the changes in area is shown in the following table.

District	Existing Area	Proposed Area
Overall area of the existing and proposed combined districts	126 acres	126 acres
Core	-	53 acres
Transitional	-	30 acres
Residential	16 acres	35 acres*
Open Space	8 acres	8 acres*

*Residential and open space areas are also to be included within the Core and Transition districts

II. By the Quadrants

Northwest CH-2

The Northwest Quadrant holds several different potential paths of development and redevelopment. Two new projects along the Route 137 frontage, CVS and RPM Carpet, have reinforced the auto-oriented, destination type business district. However, substantial land, about 19 or more acres, exist that could be developed and redeveloped.

The real estate office to the Hinckley's corner are proposed as Core district, the auto dealer and RPM Carpet properties are proposed as Transitional district, while the rear properties are proposed as Residential districts. Public open space is located within this quadrant and could become an amenity to the residential development proposed for the back properties. The development of resi-

Open Space



- Relief from development
- Formal open space
- Treed boulevards

dential units could facilitate the transfer of development rights from the adjoining R-R district lands.

New access is required if the area is to be properly serviced. Otherwise, individual driveways will be necessary to access the rear properties. This access would be similar to the example of the Loop Road proposed in the Concept Diagrams.

The key elements are:

- Infill and new mixed-use development
- Core district development focused on the main intersection
- Residential development in the rear properties possibly using a transfer of development rights, and requiring new access
- The new access could provide a 'double-loaded' commercial area and create a new 'main street' or traditional commercial corridor.

Northeast CH-2

The Northeast Quadrant is the most complex in terms of uses, their inter-relationships and their relationships to the other quadrants and neighborhood.

The public property at the main intersection provides an important relief to the commercial development, and could become a focal point identifying the village center. Improvements to the green space could create an area large enough for public events and activities. The space could be 'programmed' to have a regular series of events that increase the public acceptance of the town center. The fire station could be moved as part of the redevelopment process to a site on the private road if the programming of the open space requires additional area.

The private road mentioned is an example of the new access infrastructure that could improve the organization of the commercial and mixed

use development. This road must be finished in its connection to Orleans-Harwich Road to provide its full functionality. With this connection, the flow of traffic between the Southeast Quadrant and this location could be better facilitated and take some of the pressure off of the main intersection of Routes 137 and 39.

Carriage Estates inserts a single-family residential project into the CH-2 district with access cutoff from the district. A new path connecting this subdivision to the CH-2 district would help meet the Guiding Principles for better access and pedestrian access through the study area.

Further north lie the Town Paint plaza and the movie theater. The movie theater is an intensive land use for short periods of time, while the Town Paint plaza appears ready for redevelopment. These properties are designated for Transitional development to allow their change to meet market conditions and to transition to the adjacent residential properties.

The key elements are:

- Infill and new mixed-use development
- A Core district clustered towards the private road and main intersection
- Use of the public land as a focal point for the village center

Southeast CH-2

The Southeast quadrant is the area where the new Stop & Shop expansion has been completed. Because of the relative size and recent age of this project, the least change is expected and the maximization of the district appears to have been accomplished. Consequently no near-term changes are programmed. However, over the long-term, this area is expected to develop under the new program guidelines and will eventually meet the new design guidelines.



The Quadrants

The key element is:

- Long-term change in accordance with success in the other quadrants

Southwest CH-2

The majority of the frontage on Routes 137 and 39 is not associated with the businesses found here. In addition, the largest area of Transitional district is located behind the existing development. Consequently, this quadrant can take the form for two different implementing schemes. The first would be greater infill along the existing street frontage to better define the district. This could include stand-alone buildings in forms such as the Orvis and Talbot's buildings that exist across the street, but closer to the street frontage, or as extensions of the existing buildings. One option for the latter method is the extension of the shopping plaza out to the intersection as a counter-point to the public open space that is located on the opposite corner.

The remaining vacant land, mostly in the rear of the quadrant, is proposed as a Transitional district. Development here would require the construction of new vehicle access. This road system should be designed to accommodate bicycle and pedestrian traffic. Because the mix of uses should include residential units there should also be a path system that makes it easy to walk between the units and area businesses.

Because of the large area of vacant land, which lies outside of the Six Ponds Overlay District, this location also suggests that it could support facilities for the proposed wastewater district.

The key elements are:

- Infill and new mixed-use development
- A greater presence of buildings on Route 137

- A true mixed use development within the rear vacant land

Northwest Residential

This R-R district of about 210 acres is largely vacant, presumably because of the multiple ownerships and restricted access, but it also lies under the Six Ponds Overlay District. As such there are significant limitations on the development potential of this land. The proposed approach is to:

- Pull development out of the district with a transfer of development potential into the CH-2 district
- Set aside areas to accommodate a 'carbon neutral' program for offsets and mitigation.
- Provide paths and connections back through the land to access open spaces, natural resources and provide longer paths to other areas.

Northeast Residential

This R-R district of about 116 acres is also largely vacant, again, presumably because of the multiple ownerships and restricted access. However, the Six Ponds Overlay District does not overlie the land. Still, the proposed approach is to:

- Pull development out of the district with a transfer of development potential into the CH-2 district
- Set aside areas to accommodate a 'carbon neutral' program for offsets and mitigation.
- Provide paths and connections back through the land to access open spaces, natural resources and provide longer paths to other areas.

Infrastructure

I. Roadways

If adopted, certain design principles will improve the operation, mainte-

nance and impact of the road system. This includes:

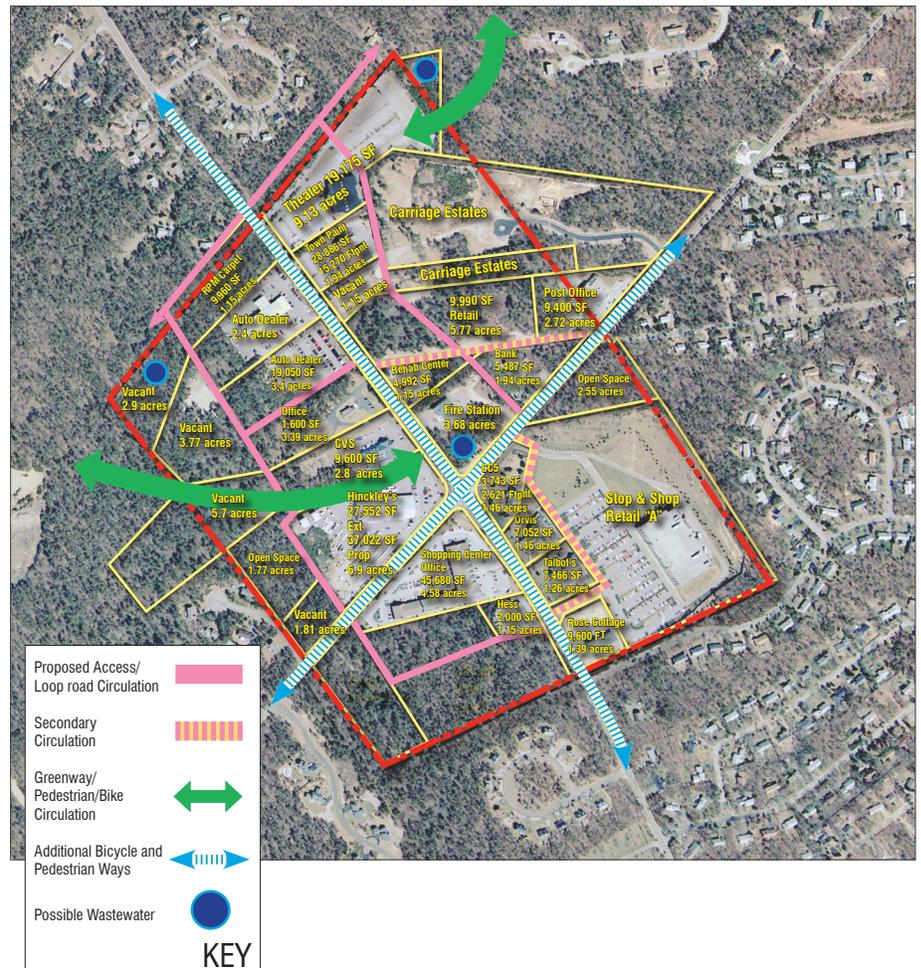
- Build loop roads that avoid dead ends and promote connectivity. This enables local traffic to use smaller streets rather than be funneled into the main arterial. Such a system is also ideal for alternate modes such as bikes and walking.
- In location where streets cannot extend to connect to the grid, make the connection through pedestrian walkways, bike routes, or greenways.
- Consider right-of-way design that uses features such as wide canopy street trees to shade impervious areas, pervious surface treatments especially for parking lanes, filter strips and vegetated swales at the sides or as a median to capture runoff, no curbs in less busy streets to prevent channeling into stormwater drains, infiltration trenches in areas with low runoff soils, and street tree wells as detention options.
- The rights of way within the district must be considered multiple-purpose accessways serving multiple modes and purposes of travel; not just motor vehicles. This means each right of way will be designed to equally support pedestrians, bikes and vehicles.
- Reconsider standard street classifications of the AASHTO such as regional, arterial, collector etc. Many progressive towns and cities are developing functional classifications that also reflect local conditions such as topography, land use, and density and are designing cross sections to accommodate multiple users.

Proposed is a hierarchy of roads to serve the district based on the proposed adjacent land uses and the available width of travel way. The graphic on page 22 is patterned after the latest Massachusetts Highway

Department (MHD) recommendations for context sensitive design. Context sensitive means that the road not only serves access functions, but also recognizes the location and character of the area in which it is constructed.

In addition to the typical road sections, the commercial areas may require additional facilities and combinations of uses to energize the commercial district and make it more successful. In turn, the increased value of the properties may support tax increases that support the capital investments.

On page 23 are two road sections for the 'main' street corridors to increase activities and patrons for the retailers and restaurants.



II. Paths

The paths are separate from the road accessways and are proposed to facilitate easier pedestrian and bicycle connections around the district. Paths and trails will be used to provide greater connectivity between living areas and active use areas. As such they will provide the shortest path between points of common interest. Their location therefore will often be through private property upon which easements must be granted. However, the long-term benefit in reducing vehicle traffic will be very valuable.

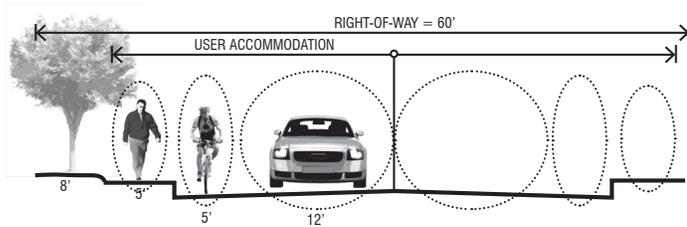
Their construction will vary according to the type and amount of expected use. They may become public facilities

ties where the access is important to meet community goals.

The proposed hierarchy of paths includes the range of informal to the formal and the range of multi use to single use:

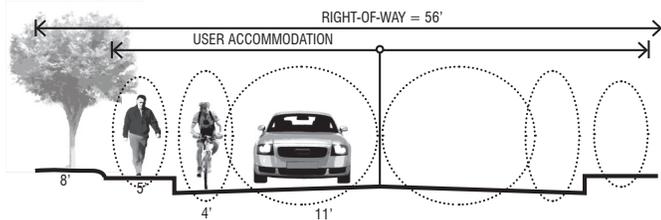
- Six to eight foot wide trails with porous, hardened surface construction
- Paved paths for combinations of bikes and pedestrians designed according to the MHD recommendations
- Sidewalks linking residential areas to commercial centers, recreation areas, open space, and other paths

East Harwich Village Road Options



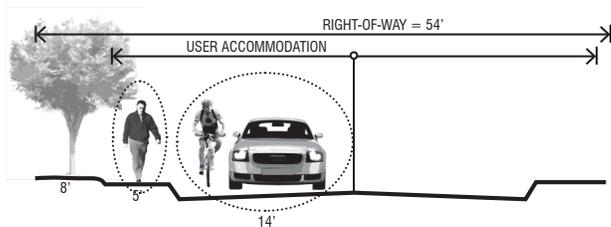
Case 1: Separate Accommodation for All Users

- Preferred option with moderate to high levels of activity
- State law calls for match with local subdivision road standards, bikeway is additional
- Vertical curb for separation
- Flexibility for drainage



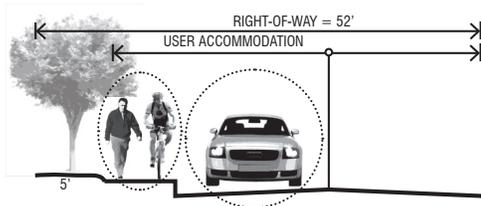
Case 2: Partial Sharing for Bicycles and Motor Vehicles

- Reduction for restricted right-of-way
- Vertical curb for separation
- Drainage must be designed for consideration of bikes



Case 3: Shared Bicycle/Motor Vehicle Accommodation

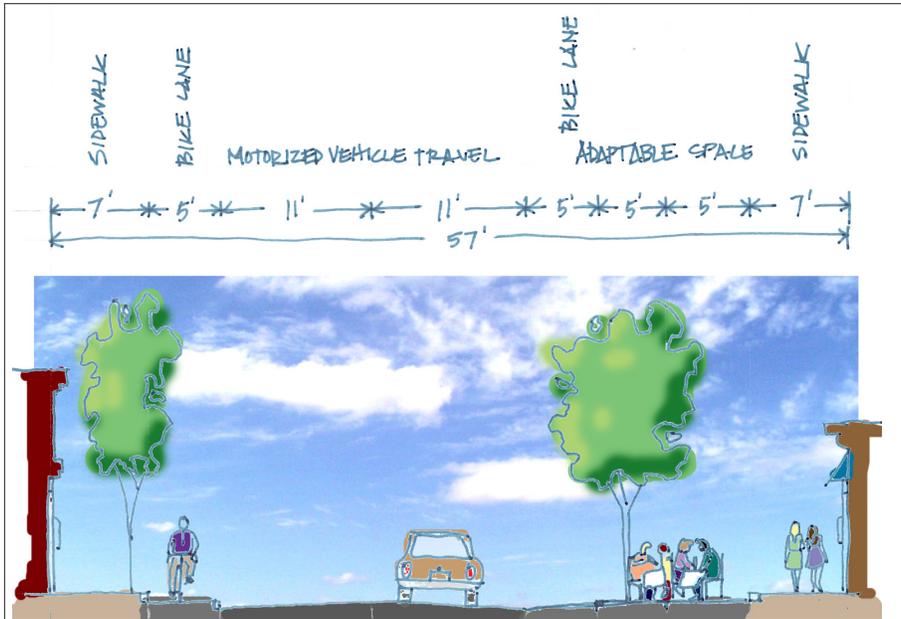
- Used for densely developed areas with very restricted right-of-way
- AASHTO recommends at least 14' for bicycle/vehicle lane
- Sloped curb recommended



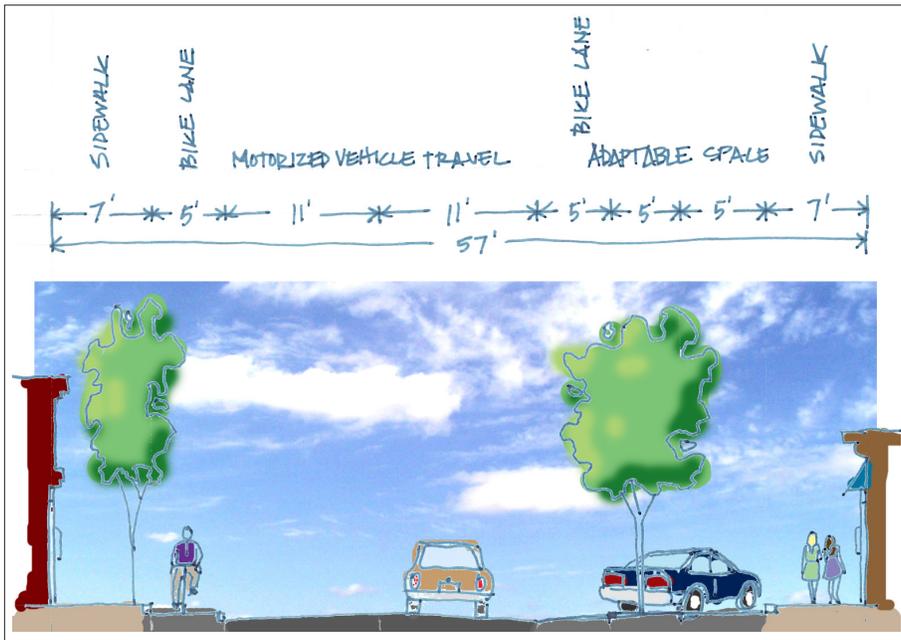
Case 4: Shared Bicycle/Pedestrian Accommodations

- Used for "trails" with combined bike and walking path
- Not recommended for main roads

Sources: MHD - Project Development and Design Guide, 2006; AASHTO - Guide for the Development of Bicycle Facilities, 1999



Road Section: Adaptable Space A



Road Section: Adaptable Space B

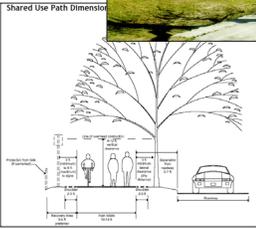
- Paths that allow consolidated parking facilities and short walks to activity areas.

III. Low Impact Development

The Low-Impact Development (LID) approach combines a hydrologically functional site design with pollution prevention measures to compensate for land development impacts on hydrology and water quality. (see Ref-

erence: Low Impact Development) LID site planning strategies and techniques provide the means to achieve stormwater management goals and objectives; facilitate the development of site plans that are adapted to natural topographic constraints; maintain lot yield; maintain site hydrologic functions; and provide for aesthetically pleasing, and often less expensive stormwater management controls. Fundamental LID Site Planning concepts include:

Paths



- Provide continuous pedestrian access (residential/commercial)
- Provide bike lanes (connected to other ways)
- Address accessibility for all ages

- Using hydrology as the integrating framework
- Thinking micro management
- Controlling stormwater at the source
- Using simple nonstructural methods
- Creating a multifunctional landscape

Specific LID controls called Integrated Management Practices (IMP's) can reduce run-off by integrating stormwater controls throughout the site in many small discrete units. IMP's are distributed in a small portion of each lot, near the source of impacts, virtually eliminating the need for a centralized best management practice (BMP) facility such as a stormwater management pond. A developed site can be designed as an integral part of the environment maintaining pre-development hydrologic functions through the careful use of LID control measures. LID can achieve stormwater control through the creation of a hydrologically functional landscape that mimics the natural hydrologic regime by:

- Minimizing stormwater impacts to the extent practicable. Techniques include reducing imperviousness, conserving natural resources and ecosystems, maintaining natural drainage courses, reducing use of pipes, and minimizing clearing and grading.
- Providing runoff storage measures dispersed uniformly throughout a site's landscape with the use of a variety of detention, retention, and runoff practices.
- Maintaining pre-development time of concentration by strategically routing flows to maintain travel time and control the discharge.
- Implementing effective public education programs to encourage property owners to use pollution prevention measures and maintain the on-lot hydrologically

functional landscape management practices.

A current example of the application of these principles can be found in the design of the stormwater management system in front of the Talbot's and Orvis buildings on Route 137. The system includes a series of vegetated swales to handle stormwater. However, note that in this case pedestrian connections to the Route 137 travelway are restricted by the swales.

IV. Sustainability

Sustainability can be addressed through a number of the other elements such as smart growth design, Low Impact Development, and an improved wastewater treatment system. Actions that could support greater sustainability include:

- Use appropriate street alignment or width and development patterns to reduce shading and maximize solar energy potential for all buildings.
- Minimize the Cape's electricity demand by reducing energy consumption and explore generating power on-site. Develop the electrical distribution system as a distributed energy system to enable all of the power need being met with local distributed generation systems.
- Support alternative energy sources with the purchase of 'green' power sources.
- Use high efficiency lighting strategies for walkways, streets, signage, and other outdoor lighting. Design all outdoor lighting to protect the darkness of the night sky.
- Perform a feasibility study of a district heating and/or cooling system that may utilize cogeneration and or a ground or water source heat exchanger.

- Use active and passive solar energy systems to minimize demand for electricity and natural gas as well as generate electricity to the maximum amount feasible.
- Refer to LEED guidelines for energy conservation in buildings.
- Coordinate these considerations with the Cape Light Compact.
- Education and inspiration: The buildings should include features intended solely for human delight and the celebration of culture, spirit, and place appropriate to the function of the building. Educational materials about the performance and operation of the buildings should be made available to the public.

In defining the future of not only East Harwich, but the town as a whole, and even the whole region, one consideration must be what level of sustainability can be maintained so that resources are preserved for future generations. Sustainability can go beyond those aspects normally associated with site planning functions and zoning to energy conservation and even a balancing of true development impacts on the regional scale. To that end, proposed are Living Village Performance Standards that define more intensive sustainability goals and actions.

Living Village Performance Standards:

- Limits to growth: The total building area will not exceed the total square footage allowed or what is possible when balanced against the total mitigation and performance package.
- Land balance exchange: For each acre developed for buildings, an area must be set aside for wildlife habitat, groundwater protection, and/or carbon management.
- Net-zero energy: All or a portion of a building's energy needs, on a net annual basis, must be supplied by onsite renewable energy.
- Combined systems: Combined energy, wastewater management and water systems should be used where a measurable increase in quality and sustainability is achieved.

- Carbon footprint: The building should offset the embodied carbon footprint of its construction through a one-time carbon offset, and the long-term energy demands should be offset by the appropriate management of the open space areas created inside and outside the development. (see Reference: Carbon Neutral Footprint Program)

V. Wastewater

A village-scale wastewater treatment plant is likely to be cost-effective for the study area. The cost-per unit decreases with density, as a significant part of the wastewater infrastructure is the sewer lines that convey the sewage. A village-scale system could also provide service to adjacent resi-

Sustainability (Low Impact Development)



- Cluster buildings to reduce impermeable surfaces
- Contain and treat storm water on site
- Seek alternative energy sources
- Share parking where possible

dential areas, replacing existing (and aging) Title 5 systems. This would result in approximately a 5:1 benefit in reducing nitrogen loading from these areas. This reduction could be used to offset potential new development in the CH-2 district, possibly achieving a no-net increase in nitrogen loading.

An additional improvement in groundwater quality could be achieved with the installation of irrigation wells downgradient of village-scale wastewater treatment plant, to re-capture the nitrogen discharged to ground water and re-using this as irrigation water for landscaping throughout the village center and possibly at a golf course which is being discussed to the west of the study area. This would result in a further reduction in nitrogen loading and could lead to an overall net reduction in nitrogen loading to the estuary.

The Building Program suggests the reduction of maximum development in the CH-2 to the Core district to approximate the existing square footage of commercial space, which can then be expanded in the Transitional district as mixed uses. Multi-family residential development than fills out the remaining area, providing a higher level of activity and support to the businesses and reducing vehicle travel by placing the users next to the goods and services.

Expansion of the infrastructure is also anticipated but would be framed and controlled to not only manage but effectively reduce impacts from new growth. This would require combined wastewater systems, better accessibility and mobility, and reductions in vehicle trip generation.

Building Program

The Building Program is the expected development that would occur if the changes in zoning and land use are implemented according to the suggestions presented here. In turn, the Building Program helps define the area requirements and design criteria that could be considered in the regulations that govern future development. (see Reference: Program of Building Elements)

Water/Wastewater



- Provide package treatment plant
- Clean storm water before recharge (keep the bay healthy)

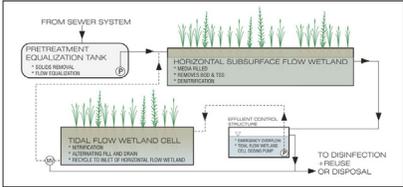
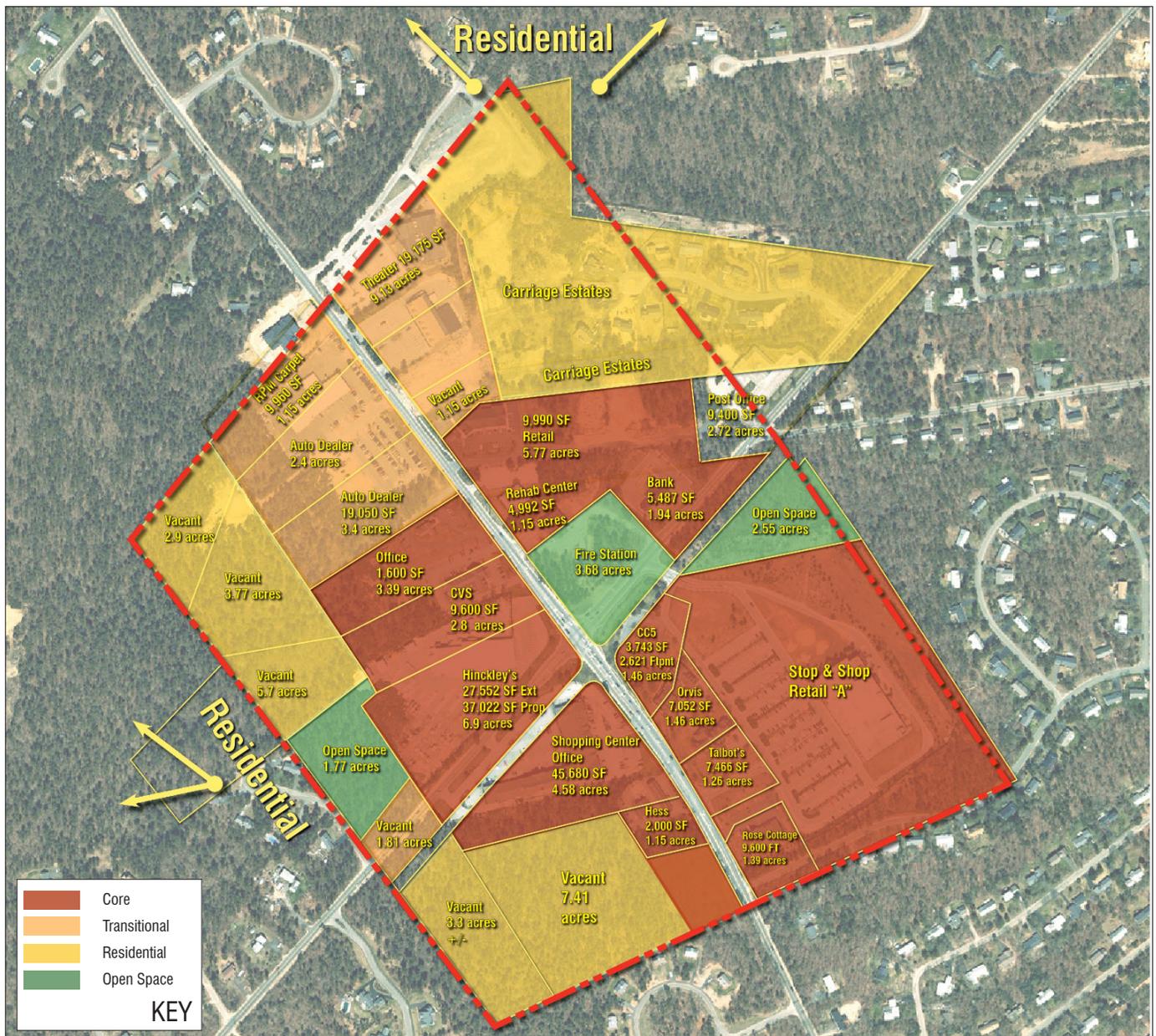



Table of Buildout by District

District	Existing Development Potential	Proposed Development Potential
Core	639,200 sf	434,400 sf
Transitional	382,300 sf	262,200 sf
Residential	195,000 sf	125 units*
Open Space	8 acres	8 acres + *
Totals	1,217,000 sf	696,600 sf mixed use and 250,000 sf residential

*Additional open space and residential units will be created in the Core and Transitional districts



District Map

PROPOSED TRANSECT



LEGEND

	High impact
	Low impact
	Open space interface
	Residential

These images illustrate typical buildings, mix of uses and relationships that would be found in each of the districts described in the land use plan. The location of the transect is shown on the Land Use Overlay, page 16.

4. Key Ideas

Implementing the Guiding Principles through applications that advance those principles and create the type of development envisioned by the last Alternative will result in a high quality village, actually involves many different and interrelated actions.

To illustrate how these Guiding Principles could be advanced, each of the Principles can be associated with some key ideas and specific examples of the applications. This does not mean these are the only ideas or examples to advance the new village concept under these Principles, but are appropriate to the planning direction currently under consideration.

The proposed actions are extensive. The actions represented here require zoning bylaw amendments, capital program items, developer agreements, interagency agreements, outside funding, scientific study, and most importantly, public education and consensus building. The later points are very important and are addressed as actions in the following section on Next Steps.

Application of the Guiding Principles

The following section lists the Guiding Principles, the Key Ideas for implementation, and Specific Action Examples as to how these might be applied through regulatory changes, capital programs, and other actions of the Town.

Keep it Green. Open and green spaces define Cape Cod and should be included in any definition of East Harwich.

Key Ideas:

- Add requirements for integrated and significant landscaping and open space in the new development proposals.
- Specify minimum sizes for active and passive open space.

- Make sure those open space areas are linked and accessible by pedestrians.
- Improve town-owned spaces to level associated with the village center.

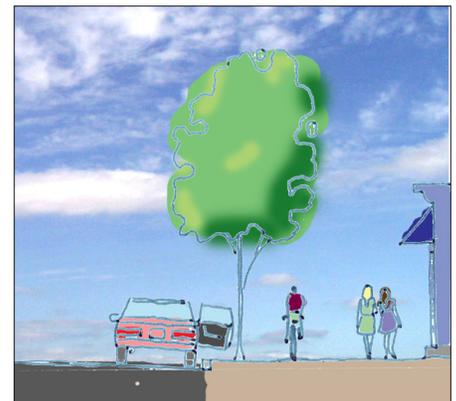
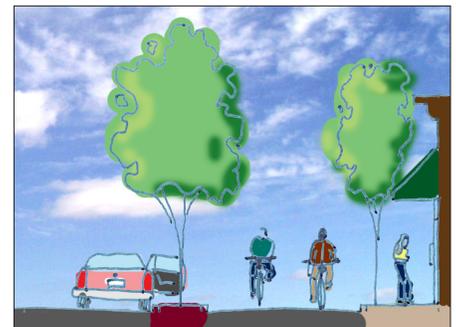
Specific Action Examples:

- Define the types of desired open space in the Zoning Bylaw. Do not leave the open space as a remainder of the site planning but as an integral part of the overall design of building and spaces.
- Improve the parking landscape standards in section 9.3 of the Zoning Bylaw.
- Reduce the minimum parking space dimensions to reduce impervious surfaces. Currently cars average 16 feet in length while the Zoning Bylaws call for 21-foot-long spaces.
- Present a capital budget item for improvement of the existing town open space. Budget estimate is \$375,000 to design and construct a village center green.
- Consider options for a Business Improvement District, or, District Improvement Financing District where the village business owners would participate directly in the maintenance and improvement of the village center.

Relate to the Pedestrian. The village neighborhood should not only allow but encourage walking.

Key Ideas:

- Make sure all areas are linked and accessible by pedestrians.
- Develop at a scale and character related to the pedestrian and bicyclist, not to the adjacent vehicles.
- Position development in ways that encourage walking links by shortening distances between buildings, adding connecting walkways,



Specific Action Examples:

- Continue the capital program for sidewalk construction that has built new sidewalks on Route 39. Include \$50,000 each year to be supplemented with mitigation funds from private development.
- Consider less restrictive buffer requirements for parking lots (section 9.3) so that safe, high quality pedestrian access can be provided to connect adjacent areas.
- Change minimum building setback requirements in the portion of the Six Ponds District that falls within the CH-2 zone to allow buildings to locate closer to road frontage.

Reuse and Redevelop First. Expansion of commercial uses is not desired without benefits and offsets to the neighborhood and to the town.

Key Ideas:

- Reduce commercial zoning into a core, mixed-use district.
- Provide density bonuses as an incentive to redevelop where a balance of open space is also provided.
- Provide amenities and procedural incentives to redevelop first.
- Provide infrastructure that supports the developed area.

Specific Action Examples:

- Divide the CH-2 district into sub-areas and a different mix of uses.
- Add additional areas for housing and allow other residential uses in the CH-2 district such as multifamily dwellings, shared elderly housing, and lodging houses.
- Provide an option for Transfer of Development Rights as an incentive to redevelop [see Reference: Transfer of Development Rights].



- Develop streetscape and public space improvements in existing developed areas to reinforce and encourage new private investment.
- Provide option for shared parking [in section 9.3.7 of the Zoning Bylaws] to reduce new parking lot expansion.
- Create a wastewater district that allows dense develop yet improves water quality (see Reference: Wastewater District Management).
- Establish a Growth Incentive Zone [Chapter G of the County Ordinance 05-13] that allows special dispensation to redevelop in accordance with the approved district.

Compact Development. Pull development into the village center instead of allowing it to sprawl into adjacent open space.

Key Ideas:

- Design projects and programs based on Smart Growth concepts.
- Provide density bonuses for certain project types.
- Reduce dimensional, area and other spatial requirements that expand the development footprint.

Specific Action Examples:

- Adopt the Smart Growth policies of the County, Commonwealth, and/or Federal government as policies of the town.
- Create less restrictive buffer requirements for commercial areas and parking lots [such as section 9.3 of the Zoning Bylaw].
- Provide option for shared parking [in section 9.3.7 of the Zoning Bylaws] to reduce new parking lot expansion.
- Change section 9.3.7.3 so as to not penalize developments for

putting parking under occupied structures.

- Consider reductions in parking requirements to reduce parking lots.
 - Reduce the required dimensions of a parking space; currently 9 feet by 21 feet in the Definitions of the Zoning Bylaw, to a size reflective of the smaller average size [16 feet] of cars today.
 - Development density can be otherwise controlled by floor area ratio [FAR] standards that control the size of buildings.
- Provide an option for Transfer of Development Rights to allow denser development balanced with preserved open space [see Reference: Transfer of Development Rights].
- Allowing additional housing types will require amendment of the CH-2 bylaw to allow other residential uses such as multi-family dwellings, shared elderly housing and lodging houses.
- Consider relaxation of the coverage requirements within the proposed Core and Transitional districts to allow 40% to 50% building coverage as a bonus for preferred development projects. An option is to require mixed use, with second story residential uses, with the coverage increase or provide the coverage increase as a bonus when the additional residential units are provided.

Provide Offsets and Match the Carrying Capacity. Do not overburden existing infrastructure and the environment, particularly groundwater and wastewater.

Key Ideas:

- Develop according to a set of performance standards, guide-

lines and principles that balance impacts and mitigation.

- Set goals for preservation, protection and enhancement of major natural systems.

Specific Action Examples:

- Set traffic generation performance standards for all new development to force reductions in traffic generation and encourage more pedestrian and bicycle options.
- Consider application of the state's Chapter 40R and 40S for offsetting the financial impacts of residential development.
- Use the undeveloped residential zoned land surrounding the CH-2 district to provide open space, balance development impacts and provide secondary access for paths.
 - Add the Transfer of Development Rights option
 - Allow off-site wastewater facilities
 - Allow open space and coverage requirements to be met with land set aside as permanent open space outside the CH-2 district
 - Mitigate development impacts with LID standards (see Reference: Low Impact Development).

Improve the Access. To use the land most efficiently and with the least impact, carefully design new access ways that serve the kind of development desired.

Key Ideas:

- Make the district walkable and bikeable.
- Connect the district with walking and biking paths beyond the district and connecting to the region.



Options for new travelways

- Add a 'loop' road within the CH-2 quadrants that connects the rear commercial properties, provides potential connections to the adjoining lands and provides a safe and pleasant option for mobility.

Specific Action Examples:

- Set criteria for road sections that include substantial elements for pedestrians and bicycles.
- Include requirements for paths outside the vehicle rights of way to allow more efficient and direct connections favored by pedestrians.
- Set plan for continuation of the paths along Routes 137 and 39 to other neighborhoods.
- Create developer agreements to ensure the continuation of the loop road through all private properties.
- Create developer agreements and regulatory standards to ensure the cross-connection of walking and biking paths between private properties to connect residents with the goods and services, and the open space and recreation offered within the district and the region.

Retain a Cape Cod Character. Adopt design guidelines that define a local tradition.

Key Ideas:

- Define what the building and landscape character of Cape Cod is and what the East Harwich village represents.
- Activate the procedure to apply updated design standards within the normal review processes.

Specific Action Examples:

- Consider the standards included in the Village Commercial District

and the Harwich Center Overlay District [Sections 11 and 14 of the Zoning Bylaw] for application to the CH-2 district.

- Adopt design guidelines using existing documentation, such as:
 - *Designing the Future to Honor the Past: Design Guidelines for Cape Cod* of the Cape Cod Commission,
 - Design guidelines included in the local Zoning Bylaw, such as section 8.0 Scenic Roads, and
 - Local preferences determined from a process of selection and application, (see Reference: Character of Place).

Make it Green. Sustainable designs help both the district and the community as a whole.

Key Ideas:

- Adopt siting design standards that improve the energy efficiency of the buildings in the district.
- Adopt standards for low impact development that reduce the footprint and impact of new development.
- Adopt standards that set a legacy of low impact on the environment as a whole.

Specific Action Examples:

- Amend zoning site plan review and design guidelines to consider solar access, wind breaks and other site improvements for energy efficiency.
- Change the parking lot construction standards [section 9.3.5.10] to allow porous pavement, rain gardens and subsurface drainage systems.

- Adopt LEED as both a mandatory and optional standard for new development. An example of a LEED analysis is included in Reference: Potential LEED Approach.
- Create a wastewater management district that establishes the basis for reducing total nutrient loading to the groundwater.
- Consider the development of 'carbon neutral' programs [see Reference: Carbon Neutral Footprint Program]

Earth-sheltered home located on Aquidneck Island, Rhode Island



5. Next Steps

Advancing this plan and its recommendations into concrete action will require some procedural steps that define the commitment of the Town and the private landowners. There are several ways the plan could then be implemented. The two major initiatives would be to continue as a government initiative supported by the neighborhood and community, or to form a partnership, or partnerships with development interests to create a project plan with associated regulatory programs developed concurrently. The government process has the advantage of an assured political outcome, while the partnership process has the advantage of being based on actual market potential. The Town will be best served when the plan is organized to understand the value to the developer and then determine the opportunities that the community may be provided by that potential development. In addition, once one private party is successful in completion of the steps, it is more likely that other landowners in the district will follow suit.

Below are the recommended steps to advance either process.

Town Policies, Coordination, and Programs

There are some initial actions that will define the Town's position, confirm the basis for discussions and negotiations, and set the parameters for funding and policy support from the other levels of government.

Adopt a Policy Directive – Town Meeting, the Selectmen and/or the Planning Board could lead the effort by approving and establishing town policy to act according to the Guiding Principles. This will ensure that further actions and discussions can be advanced with the non-town entities such as the state, federal agencies, and developers. The policy should also state the ultimate objective, generally defined through the vision, and commit the town to taking the series of steps that could achieve that vision.

Approach the CCC, and State and Federal Agencies – The Town should approach the Cape Cod Commission, and concurrently approach the State (DHCD, MHD) to establish joint interests in the outcomes for the district. Armed with a plan and a program for action, the agenda for the meeting is to explore the state mechanisms that would allow the plan to proceed, and determine the level of support of the agency towards the proposed partnership, see *Funding and Programs*.

Prepare MOU – Before any commitments should be made to entities outside the Town government, a Memorandum of Understanding should be drafted and discussed with the relevant agencies. This MOU will define the processes within which the concepts may be acted upon, the roles of each of the parties, and the ultimate goal and purpose for the projects.

Funding and Programs – The suggested “toolkit” for implementing the redevelopment includes funding, zoning regulations, and capital program decisions. Many of these require Town Meeting action and should be scheduled for the Warrant. Other actions only require the filing of an application, such as the grant programs. However, to make the strongest application, the initial steps of setting a policy direction for the Town should be completed to support the program requests. The grant program that will provide the most efficient funding to move the project ahead includes the Smart Growth Technical Assistance Grants from the State. However, this year's round for funding under this program has closed. There are still other funding programs that could be used to advance these next steps.

- *State Agency Funding* - Certain State funds are available to help advance the project, depending on the decisions for the redevelopment plans. These include planning and zoning work, af-

fordable housing programs and infrastructure grants. The key planning programs are the Commonwealth Capital Program funds. The affordable housing programs are quite numerous but include not only subsidies to the housing projects but also, direct subsidies to the Town under chapter 40R and 40S. The Public Works Economic Development grant program is the most important option for road and other infrastructure improvements.

- *State Legislature* – The State legislative body should be approached to ensure that they are familiar with the plan of redevelopment and with their potential roles in ushering through supporting legislation. This supporting legislation may be necessary for certain legal agreements and land transfers that will be needed to accomplish the plan. A key action may be the new wastewater management district. At the same time, certain federal programs such as infrastructure (Federal Highway), economic development, and land conservation programs could be explored with the assistance of the area’s federal legislators.
- *Municipal Set Asides* - The Town has a long-term interest for municipal facilities including public infrastructure. The possible land areas that should be set aside for these facilities will generate the potential set-aside areas within the district. Using the Town’s capital program, develop a facilities plan that specifies land needed within this neighborhood for municipal facilities.
- *Community Preservation Act* - The Community Preservation Act (CPA) is a local funding mechanism to pay for the acquisition of land, affordable housing and historic preservation. If adopted by the community, a property tax of up to 3% may be set-aside for

the purposes of the fund. The CPA funds could be used to fund acquisition of land within the district, and construction of the housing and recreational components of the site.

- *District Improvement Financing Program* - A DIF may be one option to allow significant public infrastructure to be constructed outside the mitigation process.
- *Chapter 40R/S District* - An option for additional state funding could be achieved with a 40R zoning designation that would provide state grants directly to the town in the event that the town accepts higher density residential development.

Town Regulations

The program of actions requires changes in the local bylaws and regulations. Some of the processes are typical and well-known while some of the other initiatives will require some intermediate steps

Amendments to Existing Zoning By-laws – Most of the regulatory changes proposed in this study deal with amendments to the CH-2 district. However, the recommendations also include changes to the supporting bylaws, such as the definitions and overlay districts. Some of the key changes, such as approaching the buildout according to Floor-Area-Ratio rather than coverage and height will require additional discussion and consensus. Below are recommendations to advance some of the other key topics.

- *Transfer of Development Rights* - Transfer of Development Rights (TDR) is a regulatory tool available to the Town through the zoning powers. It allows development rights to be transferred from undeveloped and underdeveloped properties from one location in the Town to another. This is a powerful tool that could

be used to create the density that may be necessary to make the best project feasible. The first step to advance this concept is education. A workshop on TDR would be a recommended action. Towns that have been implementing TDR, such as Groton, Falmouth, and Hadley, could be invited in to share their experiences.

- *Design Guidelines and Performance Standards* - Design Guidelines and Performance Standards are found in some of the newer advances in land use regulation. These are standards that go beyond the general form for construction defined within most zoning standards and get to some of the detail and context of the buildings and sites so that the character and quality are high, and the livability and sustainability are built in to the project. The process to accomplish the adoption of these standards should include visual preference surveys, through photo surveys and site visits, followed by discussions of the specific goals to be accomplished by the guidelines and standards, and then the construction of those guidelines and standards with public review.

Establishing a Wastewater District – The procedures for establishing a new wastewater district should be based on the State DEP’s Guide to Wastewater Management Planning, 1996. This suggests an analysis of existing conditions, comprehensive review of the alternatives for treatment, and a decision based on the recommended selection criteria.

Establishing an Advanced Sustainability Program – The first step to create an advanced sustainability program for East Harwich is to determine how ‘green’ the Town wants to become. This should be completed in partnership with the landowners [see Partnership Process, below]. The elements of the adopted sustainability program can range from mandatory

to optional and range from solely private, to public-private, to solely public actions. The mandatory elements will be those available under the local police powers of the Town such as zoning standards and the defined guidelines and performance standards. Other items may require changes in building codes and other legislation, or may be promoted with private development interests who could incorporate the design and program elements.

The recommended process would include public meetings to define sustainability as a public policy and then review options for application of those policies.

Partnership Process

This process would involve a private party with a direct ownership interest in land who wishes to advance a proposal that would follow the guiding principals.

Designate an Implementation Team – Success requires a team of individuals committed to completion of the plans, such as concluding contracts, agreements, and negotiations. In most successful redevelopment projects there are actually two teams. One is the planning team that decides on an appropriate plan for redevelopment. This requires analysis of the property, consensus building, and designing a program that can be implemented. The other team are those who implement the plan. This second team must become familiar with selection processes and legal agreements that are unique to a complex redevelopment project. This team must also be prepared to respond to changes in direction that will occur in a complex redevelopment project.

Developer RFP or Invitation – A Developer RFP is one of the tools available to the Town to determine the real value and potential of portions of the district and who wants to participate.

The other option is to present specific invitations to those who may be prepared to advance their plans.

The partnership process is typically structured as follows:

- *Initial Process Agreement* - A process agreement would be signed by the Town and the Owner agreeing to follow a process that has a mutually beneficial outcome; greater clarity of and a higher level of incorporation of Town needs and goals in the development project, and a facilitated development review process in the event that the final project meets expectations. The agreement should have a schedule and allow that participation in this process is in no way suggesting a limitation on the development potential provided by existing zoning (no 'taking' issues). The basic goals and format would be included in the agreement as well. These initial goals would be to define a mixed use project that meets the Guiding Principles adopted by the Town for the village. The eventual project may include land use regulatory changes, TDR, a wastewater district and new road construction standards. The powers available to the Town through state and county law; such as GIZ, DIF, 40R/S will be made available where justified.
- *Project Goals and Design Guidelines* - The schedule will include a public process to further refine the design guidelines and regulatory schemes that define what is acceptable [see Design Guidelines and Performance Standards, above]. This should include participation by the Owner with recommendations on development patterns acceptable for the project design goals.
- *Peer Review* - Since the Town will not be designing the project for the Owner, this part of the process will include working with the proponent's specialists as they advance concept plans for analysis and critique. These specialists may include architects, landscape architects, real estate market specialists, financial analysts, and lawyers.
- *Zoning Amendments, Town By-laws, Other Town Actions* - This would involve the drafting of the regulations and programs that will set in place the Town's requirements and allow the project to proceed under whatever public programs are required [see Town Regulations, above]. Town Meeting is then placed on the schedule to allow the project to proceed.
- *Development Agreement* - This product would be the development agreement that allows the project to proceed as it has evolved with the respective obligations set for all parties. This could include the Cape Cod Commission and any other state agencies directly involved as signatory. Where appropriate, the agreement could include other developers as well.

6. Reference Sections

- A. Understanding Public Comment
- B. Program of Building Elements
- C. Transfer of Development Rights
- D. Character of Place
- E. Potential LEED Approach
- F. Sustainable Infrastructure Plan
- G. Carbon Balance
- H. Floor Area Ratio
- I. Background and Analysis
- J. Photo Review of CH-2 District

The following are the notes and summary results from the public meetings held last year to obtain community input and participation in the development of concepts for redevelopment of East Harwich Village.

Reference Section A: Understanding Public Comments

Community Conversation: East Harwich Village Center Vision June 22, 2006 Meeting Results

Note: P=Primary, and S=Secondary

Group # 1

Character of development

- An integrated Harwich; Complementary balance in the community (2P 1S)
- Should not create an enclave
- Variety of Services/Commercial diversity (1P 3S)
- Commercial development should not change character of E. Harwich
- Livable – work, live, recreate
- Should not out-compete other villages (2P)
- Neighborhood-serving/scaled commercial (3S)
- Stay in character with Cape Cod architecture (1P 1S)

Housing

- Mix of residential types (2P), Mix with commercial (1S)
- Mixed use and include affordable housing (1P)

Access and infrastructure

- Walkable (6Y)
- Internal transportation system (golf carts, moving walkway) (2P)
- Beltways to divert traffic (alternate access for cars) (3P)
- Reduce curb-cuts – reduce asphalt (1P)
- Utilities underground (2P 2S)
- Use shared parking (1P)

Open space

- Maintain sufficient natural open space (6P)

Environment

- Protect/sustain drinking water supply (6P)

Public facilities

Community facilities and neighborhood gathering places (1P)

Mini parks and playgrounds (5P)

Safe and secure center (2P)

Process

- Use transfer of development rights (4P)

Group # 2

Character of development

- Keep commercial with good traffic patterns (1S)
- Need employment opportunities (office space) (1P)
- Keep appropriate size and scale (2S)
- How can a regional center be a village center?
- Higher density for affordable housing (2P 1S)
- Local merchants for local people
- Character of Cape Cod (2P)
- Cape Cod scale of development (1S)
- Small village feel
- Multipurpose
- Family restaurant (2P 1S)
- Incorporate post office (1P)
- No drive through businesses
- Medical facility (1S)
- Locate regional stores outside village

Housing

- Village style housing for workers (1S)
- Affordable family homes (1P)
- Housing should be mixed for all income levels (2P)

Access and infrastructure

- Route thru traffic around intersection (4P 2S)
- Park closer to stores
- Village center can't have a major intersection (3P)

- Need sidewalks and bikeways connected for use and safety (6P)
- More pedestrian, less vehicles (1P 1S)
- Regional transportation system to reduce traffic
- Transportation within district

Open space

- Link the open spaces (4P)

Environment

- Use of green space and natural landscaping (3P 3S)
- Account for year-round weather conditions

Public facilities

- Add public facilities in village center
- Places of social interaction (1P 3S)
- Children and family friendly (1P)
- Parks for families (1P)

Process

- Stick to planning – eliminate variances and special permits (1P 4S)
- Keep businesses within existing zoning district (1S)
- Village should control commercial creep – strip development (6P)
- Need long term (50-year) plan (1P)
- Community should decide what types of businesses are needed
- Make sure businesses do not violate rules (1P)

Group # 3

Character of development

- Define an East Harwich community (6P 1S)
- Small-scale commercial (1P)
- Do not make this the next Mashpee Commons (2P)
- Compact development (2P)
- Retail to be proud of (4P)
- Unique uses and design (4P)
- More good places to eat (2P)

Housing

- Add workforce housing (3P)
- Housing opportunities and mixed use (8P)
- Target older population in mixed use (1S)

Access and infrastructure

- Pedestrian friendly (4P)
- Separate traffic types (4S)
- Large scale connections (1P 4S)
- Connections within district (4P 1S)
- Need remediation of traffic impacts (7P)

Open space

- Low impact through green space (2P 2S)

Environment

- Sensitivity to Pleasant Bay (2P)

Public facilities

Process

- Design guidelines (3P)
- Consider second homeowners (2P 7S)

Group # 4

Character of development

- Keep at a low density
- Do not allow 3-story buildings (1P)
- Golf course (5P)
- Seek higher end retail (1S)
- No big box retail
- Restaurants desired but must be controlled for GW impacts (3P 1S)
- Add businesses that support senior housing (1S)
- Design for density of the Main Street character (3P)

Housing

- Create workforce housing in duplex and multifamily housing (2P)
- Active senior housing (e.g. Park Place) (3P 1S)
- Provide 2nd story living space

Access and infrastructure

- Add sidewalks and walking paths (2P 1S)
- Add bikepaths (1P 3S)
- Keep a small town road - no boulevard (2P)
- Create connections between residential and commercial (1P)
- Add sidewalks with trees (4P)
- Traffic impacts must be controlled (2P)
- Create satellite parking, like P-town, with Flex bus (1P)
- Add more small-town streets
- Underground the utilities (1P 3S)

Open space

- Preserve green space (1P)

Environment

- Develop a sewage treatment district (3P 1S)
- Use solar panels for businesses (4S)
- Use wind power for businesses (1P)

Public facilities

- Create a public garden (3P)
- Add active recreation – tennis courts and playgrounds (2P 3S)

Process

- Maintain the status quo
- Need an implementation plan

Combined Results

[Ranked by number of votes]

Character of development

- Define an East Harwich community (6P 1S)
- Design for density of the Main Street character (3P)
- Should not out-compete other villages (2P)
- Do not make this the next Mashpee Commons (2P)
- Character of Cape Cod (2P)
- An integrated Harwich; Complementary balance in the community (2P 1S)
- Stay in character with Cape Cod architecture (1P 1S)

Scale

- Cape Cod scale of development (1S)
- Keep appropriate size and scale (2S)
- Small-scale commercial (1P)
- Compact development (2P)
- Do not allow 3-story buildings (1P)

Uses

- Golf course (5P)
- Retail to be proud of (4P)
- Unique uses and design (4P)
- Restaurants desired but must be controlled for GW impacts (3P 1S)
- More good places to eat (2P)
- Family restaurant (2P 1S)
- Variety of services/commercial diversity (1P 3S)
- Incorporate post office (1P)
- Need employment opportunities (office space) (1P)
- Neighborhood-serving/scaled commercial (3S)
- Medical facility (1S)
- Seek higher end retail (1S)
- Keep commercial with good traffic impacts (1S)
- Add businesses that support senior housing (1S)

Other

- Commercial development should not change character of E. Harwich
- Livable – work, live, recreate
- How can a regional center be a village center?
- Local merchants for local people
- Small village feel
- Multipurpose
- No drive through businesses
- Locate regional stores outside village
- Keep at a low density
- No big box retail

Housing

- Housing opportunities and mixed use (8P)
- Active senior housing (e.g. Park Place) (3P 1S)
- Add workforce housing (3P)
- Mix of residential types (2P), Mix with commercial (1S)
- Higher density for affordable housing (2P 1S)
- Housing should be mixed for all income levels (2P)
- Create workforce housing in duplex and multifamily housing (2P)
- Mixed use and include affordable housing (1P)
- Affordable family homes (1P)
- Village style housing for workers (1S)
- Target older population in mixed use (1S)
- Provide 2nd story living space

Access and infrastructure

- Traffic
- Need remediation of traffic impacts (7P)
- Route thru traffic around intersection (4P 2S)
- Village center can't have a major intersection (3P)
- Beltways to divert traffic (alternate access for cars) (3P)
- Keep a small town road - no boulevard (2P)
- Separate traffic types (4S)

Paths

- Need sidewalks and bikeways connected for use and safety (6P)
- Walkable (6Y)
- Connections within district (4P 1S)
- Add sidewalks with trees (4P)
- Pedestrian friendly (4P)
- Add sidewalks and walking paths (2P 1S)
- Internal transportation system (golf carts, moving walkway) (2P)
- More pedestrian, less vehicles (1P 1S)
- Add bikepaths (1P 3S)
- Create connections between residential and commercial (1P)

Utilities

- Utilities underground (3P 5S)
- Traffic impacts must be controlled (2P)
- Large scale connections (1P 4S)

Parking/Site design

- Create satellite parking, like P-town, with Flex bus (1P)
- Reduce curb-cuts – reduce asphalt (1P)
- Use shared parking (1P)

Other

- Park closer to stores
- Add more small-town streets
- Regional transportation system to reduce traffic
- Transportation within district

Open space

- Maintain sufficient natural open space (6P)
- Link the open spaces (4P)
- Preserve green space (1P)
- Account for year-round weather conditions

Environment/Sustainability

- Protect/sustain the drinking water supply (6P)
- Use of green space and natural landscaping (3P 3S)

- Develop a sewage treatment district (3P 1S)
- Low impact through green space (2P 2S)
- Sensitivity to Pleasant Bay (2P)
- Use wind power for businesses (1P)
- Use solar panels for businesses (4S)

Public facilities

- Mini parks and playgrounds (5P)
- Create a public garden (3P)
- Add active recreation – tennis courts and playgrounds (2P 3S)
- Safe and secure center (2P)
- Places of social interaction (1P 3S)
- Children and family friendly (1P)
- Community facilities and neighborhood gathering places (1P)
- Parks for families (1P)
- Add public facilities in village center

Process

- Village should control commercial creep – strip development (6P)
- Use transfer of development rights (4P)
- Control with design guidelines (3P)
- Stick to planning – eliminate variances and special permits (1P 4S)
- Need long term (50-year) plan (1P)
- Make sure businesses do not violate rules (1P)
- Consider second homeowners (2P 7S)
- Keep businesses within existing zoning district (1S)
- Maintain the status quo
- Need an implementation plan
- Community should decide what types of businesses are needed

Top Rankings

[By item and total vote count]

Housing: Include certain types of housing (28)

Access: Make the area pedestrian and bicycle friendly (25)

Traffic: Complete traffic and road improvements (23)

Character: Improve or maintain a local character (21)

Regulation: Institute better land use controls (20)

Open Space: Preserve open space (11)

Groundwater: Protect and sustain the groundwater (11)

Recreation: Build parks and playgrounds (10)

Uses: Add eating places (9)

Uses: Add quality retail (9)

Utilities: Put utilities underground (8)

Community Conversation: East Harwich Village Center Vision October 12, 2006 Meeting Results

An effort was made to organize information from the comments provided by the public during the visioning meeting held on October 12, 2006 to better understand where the collected ideas pointed the design concept. During that meeting, attendees were asked to provide comments on the four development plans providing differing visions of future development. Each attendee was also given a sheet of paper in which to record the pros and cons of each plan.

As pros and cons are personal and sometimes specific and personal in nature, the comments were then related to larger land use goals. The following couplets are combined for example:

Pro: Pedestrian walkways

Con: Too spread out

Both cases argue for pedestrian services and accessibility, and therefore both were rated pro-pedestrian.

Pro: Like the green space integrated with the stores

Con: Green space is next to main road and is not so accessible or enjoyable

Both cases here argue for useable green space, and therefore were rated pro-integrated green space.

Negative comments were also possible where a particular part of the concept was not valued. This system was applied to all of the comments received at the meeting. The results are as follows:

	Side St.	Campus	Main St.	Lifestyle	Total
Residential	4	4	2	2	12
Pedestrian	7	7	2	8	24
Green	6	14	0	5	25
Civic	3	2	1	0	6
Vehicles	4	-3	0	1	2
Bike	5	2	0	0	7
Rotary	1	1	1	1	4
Loop Rd.	4	4	1	3	12

What this information points to is that people are looking primarily for a ‘green’ village, with usable open space, and a walkable center. This directs the plan to lower vehicle use in favor of a less dense and more pleasant pedestrian-focused center. Interestingly, the ideas of moving towards more residential development and laying in the additional access to create blocks ranked second in importance.

The following is a more detailed description of one of the four sessions. This is a summary description of the feedback received from participants on the four design concepts:

General Likes:

- Open Space
- Ample pedestrian and bicycle access
- Mixed use
- Loop roads

General Dislikes:

- Multifamily units

General Wants:

- Park areas with picnic spaces, sculptures, a gazebo, playground
- Good restaurants with outside dining
- Link to public transportation
- Continuation of bike paths along Route 137 and Route 39

	Specific Likes:	Specific Dislikes:
Campus Plan	Large amount of open space	Campus feel not Cape Cod Large parking lot too far from some buildings
Side Street	Rotary, side streets split up traffic Lots of small parks	Potential backup at rotary
Lifestyle Center	Moves inappropriate uses	Too many businesses moved
Main Street	Lots of roadway frontage for businesses	

Design Charrette Narrative

The group's concept evolved into a fusion of the Side Street and Main Street model. The first element that they placed on the map was the rotary, as we had reached a general consensus that it was a good design element as long as the surrounding roadways were adapted to minimize the potential for traffic backups. The public park and bike path cards were also put on the map at the beginning of the session.

They knew that the rotary would need to be supported by a sufficient network of new streets, so loop roads and side streets were drawn on the plan. The loop roads were drawn so as to define large block-like areas, and the intersections were located to provide easy flow of traffic between quadrants. There was some debate as to whether four-way intersections or a pair of tee-style intersections were more appropriate. One of the participants was particularly interested in tee-style intersections, but the final plan shows four-way intersections. Bicycle paths were drawn on the plan to run parallel to Routes 137 and 39, and it was pointed out that the town would do well to continue them outside of the C2 district.

The participants were very eager to place commercial and mixed-use buildings on the plan, and less excited to place parking lots or residential structures. The Stop-and-Shop parcel was left relatively untouched, as was the area that is already slated to become a clustered residential development. The other areas were fair game, and the final plan does not retain many of the existing structures. A few building configurations were experimented with, but the one that most people seemed to prefer was a Main Street style development that allowed commercial and mixed-use buildings to have frontage on the main roads and the side streets, with parking lots and open space areas located to the rear, or inside, of the clusters.

Most people agreed that it would be nice to locate some townhouses near the fringes of the district, within easy walking distance of the commercial shopping areas. No multifamily units were placed on the plan. Final design touches also included the placement of a sculpture in the center of the rotary, and the outlining of a few park areas. People were particularly interested in having a gazebo that could be used for public concerts, as well as picnic and play areas.

Submitted by Evan Waters, Horsley Witten Group

The following list is of the various components of the proposed development and redevelopment projects that could be achieved under the final Alternative. These are not final design elements but only estimates of one possible outcome used to help define the Alternative. Changes are appropriate as the implementation planning proceeds. A spreadsheet with the existing and proposed distribution of development is provided at the end of this section.

Building Elements:

1. Buildings

- A. Approximately 360,000 sf of commercial space, expandable to almost 700,000 sf, distributed into commercial spaces of 6,000 to 10,000 sf, with larger spaces acceptable but not for chain or big box retail, and spaces for residential units and office space. Established with a Floor Area Ratio (FAR) standard of 0.2 for all future floor space and to define the existing development footprint.
- B. Office space at about 25,000 sf at grade with additional space possible in upper floors in the Core District. The Transitional District may accommodate additional office space within the allowed FAR.
- C. Approximately 300 housing units, predominantly with 1 and 2 bedrooms, and with options under Transfer of Development Rights and expansion potential using impact offset bonuses. Approximately 125 units can be developed in the Residential district at 8 units per acre, with the remainder to be constructed within the Transitional and Core districts within the defined FAR.

2. Mix of uses

- A. Restaurants, coffee, personal shopping, recreation.
- B. Banks are already reasonably accommodated in the district but may be included.
- C. Local service uses are accept-

able and desired (such as hair dresser and barber).

- D. No additional or new 'big box' and bulk uses.
- E. Anchor stores will be considered but are not desired.
- F. No additional car dealerships will be accepted.
- G. One-of-a-kind places and non-chain stores are desired in the commercial mix.
- H. Housing should be integrated with commercial areas and located in clusters in the residential areas.
- I. Co-housing and other unique housing products will be considered within the residential areas of the CH-2 district.

3. Building character

- A. Multi-story buildings are acceptable and desired if character, offsets, and benefits are accrued.
- B. The upper floors of commercial buildings should be available for residential units and office space.
- C. Multifamily, workforce housing, apartments, and townhouses should be integrated into the commercial areas as upper floors in the Core and Transitional districts, and can be set out as stand-alone buildings in the Transitional and Residential districts.
- D. Orientation of the buildings should be towards all street frontages. This may require double-fronted buildings to relate to multiple streets and drives.

4. Open space

- A. The existing open space is eight acres in three parcels within the CH-2 district. These parcels will be supplemented with new open space within the development districts, and will be connected with a linear greenway with access for pedestrians and bicycles.
- B. The hierarchy of open space should include pocket parks; small sitting spaces and green space relief.

Reference Section B: Program of Building Elements

- C. Green space relief; such as trees, plantings and buffers, to mitigate visual impact, shade parking and public areas, and green rooftops should be added as accents and the linear definition of streets and other access ways.
- D. Trails; for pedestrians, bicycles, exercise, ADA should be provided throughout and should connect to the surrounding neighborhoods.
- E. Off sets should be provided for major losses of green space as development is maximized in district. The locations for green space off-sets can include spaces in the surrounding residential zoned areas.

5. Site design

- A. Site buildings to define the district; closer to street and clustered for easy walking access.
- B. Add rain gardens, porous paving, and other features for Low Impact Development design.
- C. Layout the site with access for universal accessibility.
- D. Consider water features or interpretive features that connects people to local water bodies.

6. Distribution

- A. Consider major clusters in the northwest and southwest quadrant of the CH-2 and lesser clusters on the northern edge. This program does not anticipate significant change in the land uses in the southeast quadrant where the zoning will remain as currently defined.
- B. Housing units should be mixed into commercial and clustered adjacent to commercial area.
- C. Consider options for rearranging and integrating existing land uses into new development plans.

Infrastructure Elements:

1. Roads

- A. Traffic calming measures are desired on the major routes. In particular, the pedestrian crossing of the

main intersection of Routes 137 and 39 are highly recommended.

- B. Reduce overall traffic volumes with the mix of uses and reduction in overall commercial space planned for the CH-2 district.
- C. Add a road parallel to Routes 137 and 39 to balance traffic loads on local streets.
- D. Consider the addition of a roundabout within the main intersection to add landscaping, create a village identity, improve traffic flow and calm traffic for bicycles and pedestrians. Prior to action, consider the change in operation of the intersection given the new improvements.
- E. A boulevard, if designed for the major routes of the main internal roads, must be designed to reflect a Cape Cod character.

2. Gateways

- A. Identify the entrances to the village with signage and landscape elements at the edges of the main commercial areas.

3. Stormwater:

- A. Stormwater systems are to follow Low Impact Design standards and reduce the size of the systems, distribute the control systems, and increase recharge to the groundwater.

4. Wastewater

- A. A goal of “nitrogen neutral” is desired where wastewater treatment reduces or offsets any growth and thereby maintain low nitrogen loading to the groundwater and the Pleasant Bay estuary.
- B. Combined, public, district and remote wastewater systems are desired to reduce the nitrogen loading by pulling the flows into higher quality treatment systems.

5. Structured parking

- A. Parking under structures is acceptable, but stand-alone parking structures are not considered in character with Cape Cod.

I. CORE								
Area	Sub Area	Lot SF	Max. Building Coverage (30% site)	Existing Building Coverage	Existing Expansion Potential under Zoning (SF)	Existing FAR	Proposed Max Building Space at FAR = 0.2	Remainder of Development Potential at FAR=0.2
North	Bank	86,397	25,174	5,487	19,687	0.1	17,279	11,792
	Post Office	117,386	34,230	9,400	24,830	0.1	0	(9,400)
	Rehab Center	53,519	15,574	4,992	10,582	0.1	10,704	5,712
	Retail	250,721	73,110	9,990	63,120	0.0	50,144	40,154
West	CVS	142,245	41,485	9,600	31,885	0.1	28,449	18,849
	Hinckley's	256,612	74,828	27,533	47,295	0.1	51,322	23,789
	Office	138,999	40,588	1,600	38,988	0.0	27,800	26,200
South	Hess	40,580	11,931	2,000	9,931	0.0	8,116	6,116
	Shopping Center	199,205	58,104	45,680	12,424	0.2	39,841	(5,839)
East	CC5	61,922	18,019	2,621	15,398	0.0	12,384	9,763
	Orvis	53,304	15,511	7,052	8,459	0.1	10,661	3,609
	Rose Cottage	66,756	19,466	9,600	9,866	0.1	13,351	3,751
	Stop & Shop	768,548	195,647	165,000	30,647	0.2	153,710	(11,290)
	Talbot's	53,215	15,539	7,466	8,073	0.1	10,643	3,177
Totals		2,289,409	SF	308,021	331,185		434,405	152,913
		53	Acres					

* Notes: Stop & Shop based on 1 space/ 200 SF; Stop and Shop existing building coverage is unknown; Acreage within CH-2 Boundary = 126 acres

2. TRANSITIONAL								
Area	Sub Area	Lot SF	Max. Building Coverage (30% site)	Existing Building Coverage	Existing Expansion Potential under Zoning (SF)	Existing FAR	Proposed Max Building Space at FAR = 0.2	Remainder of Development Potential at FAR=0.2
North	Theater	162,423	47,388	19,175	28,213	0.1	32,485	13,310
	Town Paint	83,108	24,237	15,270	8,967	0.2	16,622	1,352
	Vacant 1	42,609	12,399		12,399	0.0	8,522	8,522
West	Auto Dealer 1	158,172	46,120		46,120	0.0	31,634	31,634
	Auto Dealer 2	143,023	41,673	19,050	22,623	0.1	28,605	9,555
	RPM Carpet	131,434	38,332	9,960	28,372	0.1	26,287	16,327
	Vacant 2	47,846	13,923		13,923	0.0	9,569	9,569
South	Vacant 6	191,219	55,788		55,788	0.0	38,244	38,244
	Vacant 7	351,238	102,431		102,431	0.0	70,248	70,248
East								
Totals		1,311,072	SF	63,455	318,837		262,214	198,759
		30	Acres					

3. RESIDENTIAL

Area	Sub Area	Lot SF	Max. Building Coverage (30% site)	Existing Building Coverage	Existing Expansion Potential under Zoning (SF)	Existing Units / Acre	Potential Units at 8/acre	Remainder of Development Potential
North	Carraige Estates 1	595,261	173,519	NA	0	0.6	0	0
	Carraige Estates 2	98,850	28,765	NA	0	0.0	0	0
	Theater	162,423	47,388	0	47,388	0.0	30	30
West	Vacant 3	234,476	68,373	0	68,373	0.0	43	43
	Vacant 4	160,934	46,928	0	46,928	0.0	30	30
	Vacant 5	110,691	32,277	0	32,277	0.0	20	20
South								
East								
Totals		1,362,635	SF	0	194,967		123	123
		31	Acres					

4. OPEN SPACE

Area	Sub Area	Lot SF	Max. Building Coverage (30% site)	Existing Building Coverage	Expansion SF			
North	Fire Station	136,909	39,977		39,977			
West	Open Space	106,434						
South								
East	Open Space	112,814						
Totals		356,157	SF					
		8	Acres					

Reference Section C: Transfer of Development Rights

Approach

The Transfer of Development Rights [TDR] is a method used to place development in locations that are considered most acceptable, and at the same time, take away development from areas too sensitive for development or additional development, without the suggestion of ‘taking’ the private land rights from the owners. The ‘development rights’ are typically found through the zoning designation provided by the community; which in this case are the R-R and CH-2 district standards, as modified by the overlay districts. The transfer is a legal agreement, within one of several forms, that confirms that the property providing the development rights will no longer be available for development or change above some threshold, while the property receiving the transfer will increase its development potential according to some combination of the existing zoning and the transferred ‘development rights.’

Communities, including Falmouth, have used this process for many years. Falmouth started TDR for residential developments in 1986 and has continued to apply the bylaw in recent years. The County supports Transfers of Development Rights. The following is an excerpt from the introductory text to the Cape Cod Commission’s Model Bylaw for TDR, which explains some of the purposes for TDR.

“TDR programs are consistent with the purpose of the Cape Cod Commission Act and planning efforts at the local government level to further the conservation and preservation of natural and undeveloped areas, wildlife, flora and habitats for endangered species; the preservation of coastal resources including aquaculture; protection of ground water, surface water and ocean water quality, as well as the other natural resources of Cape Cod; balanced economic growth; the provision of adequate capital facilities, including transportation, water supply, and solid, sanitary and hazardous waste disposal facilities; the coordination of the provision of adequate capital facilities with the achievement of other goals; the development of an adequate supply of affordable housing; and the preservation of historical, cultural, archaeological, architectural and recreational values.”

Mechanisms

The mechanisms for most TDRs are typically through the land use regulations and permitting process. The initiation of a TDR may start with a developer’s proposal after a private transaction has been arranged. The transaction often will be a private agreement between the parties transferring development value, but will be overseen by the community through the development review process when the concept is proposed to the town.

The parcel providing the development rights is called the ‘sending’ parcel, the land obtaining the development rights is the ‘receiving’ parcel. The transfers may be one of several options:

A. *Like development to like development*; where development rights are provided as a straight transfer. A parcel of land able to support 10 residential units could transfer those development rights as units to a larger parcel where those 10 are added to however many are possible in the larger parcel. If the parcel of land receiving this development right could have accommodated 20 units prior to the transfer, then the total number of units on the larger parcel after the transfer would be 30 units.

Parcel	Number of Units Prior to Transfer	Number of Units After Transfer
Sending parcel	10	0
Receiving parcel	20	30 (20+10)

B. *Bonus for transfer*: where a bonus is provided to encourage the transfer of development rights. In this case the town may look for ways to provide an incentive to the development transfer. Here the receiving parcel gains additional units providing an increased value to both the owner of the sending parcel and, presumably, the owner of the receiving parcel.

Parcel	Number of Units Prior to Transfer	Number of Units After Transfer
Sending parcel	10	0
Receiving parcel	20	35 (20+10 +5 bonus units)

C. *Change in land use transfer*: where the transfer of development rights are converted from one use to another. In this model, the town must provide a basis for value that transfers one land use to another with the result being full restriction on the sending parcel, but some other development increase in the receiving parcel. The value is usually calculated according to market analysis.

Parcel	Number of Units or Square Footage Prior to Transfer	Number of Units or Square Footage Prior to Transfer
Sending parcel	10	0
Receiving parcel	5,000 sq ft of commercial space	25,000 sq ft of commercial space

Note: The value of the transfer for new commercial development would be based on a market evaluation. As an example, if the residential lots are valued at a retail price of \$300,000, and commercial construction costs \$150 per square foot, each residential lot transferred could be deemed to have a worth of 2,000 square feet of commercial space.

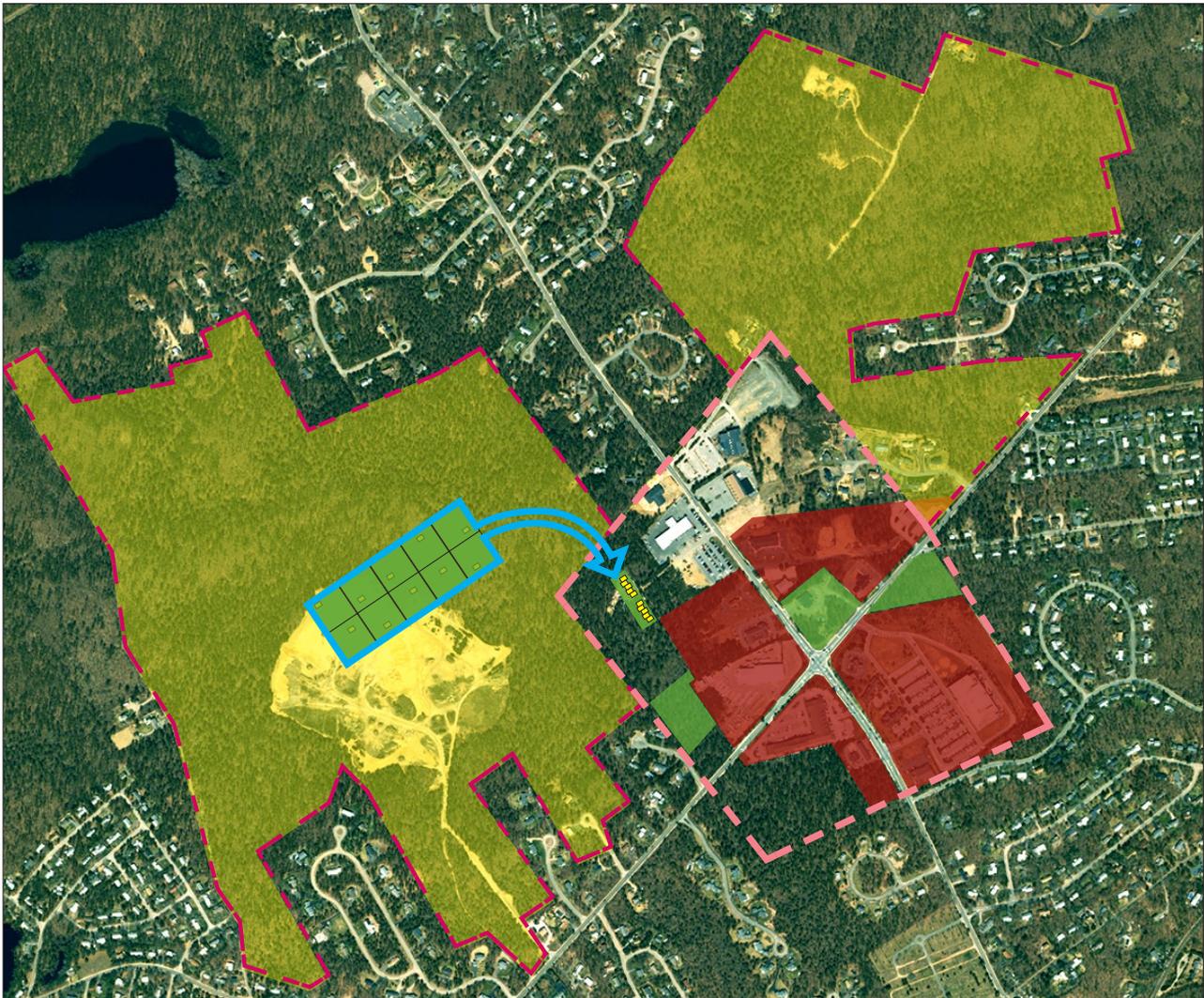
Land Back transfer: where the value of the transferred development rights is determined without an actual transfer being completed at the time of town agreement. This requires values to be determined for the bonus development provided to a project, and this money to be placed into a land bank from where it can be applied to future acquisitions. This is a way of improving the chance of raising funds for land acquisition without identifying the acquisitions at the time of development, but requires more public effort put towards finding the parcels and completing agreements for those acquisitions. To reduce some of the risk of finding land suitable for acquisition but seeing increased development, some communities will put an initial sum of money into the land bank and acquire the land first, and then sell the rights as developers come forward.

Parcel	Number of Units Prior to Transfer	Number of Units After Transfer
Sending parcel	None chosen	Future Action
Receiving parcel	20	30 (20+10)

Note: Here again the market value of the transfer will determine the fees paid to the land bank.

Goals for the Study Area

The key goal, based on the alternative developed in this study, is to transfer development rights from the existing undeveloped open space within the R-R residential district so that this district remains open and protects the ground-water quality and so functions as the sending district, and to increase the mix of uses within the CH-2 district thereby creating a smart growth district and to put the new development under a wastewater protection district that actually improves water quality. In this way, currently non-allowed residential uses (multi-family) will be permissible if included through a TDR or a mechanism that supports the creation of new open space within the adjoining districts or even other areas of Town.



Transfer of Development Rights

Reference Section D: Character of Place

Crafting Design Guidelines for East Harwich

Site planning and design-guiding principles have been successfully applied in towns and localities around New England, and could serve as models for the preparation of guidelines specific to East Harwich.

Design guidelines should evolve from the regulatory standards (zoning, and other bylaws) that allow them to be used, and from the community goals, which should be defined before the guidelines are finalized. On a general level the design guidelines work towards:

- Respecting the landscape's intrinsic character
- Showing consideration for the landscape's visually sensitive scenery
- Counteracting intimidating scale
- Maximizing views/view lines
- Influencing the observer's vertical position in the landscape
- Recognizing the importance of movement through the landscape
- Acknowledging the sequence of experiences and views through both attending to the foreground and protecting the continuity of the ground plane

Guidelines are general organizing principles aimed at the achievement of good environmental and aesthetic design qualities. They can be further tailored to the unique character and conditions of particular locations by means of assigned values, or standards, that can be quantified and measured. For example, "trees should be provided along the perimeter of a parking lot" is a guideline; "trees should be provided at an average 40-foot separation" is a standard. Standards constitute an important way in which guidelines can be tailored to the needs of a particular community, but they have been intentionally excluded from the list below.

Understanding What Design Guidelines Should (and Should Not) Accomplish

Design guidelines that are thoughtfully drafted can be powerful, effective tools. They can enable all of the participants in the land planning and development process to match proposed projects to a community's reasonable expectations. The results can include simplifying the cycles of discussion, review, revision and approvals in which they are engaged. However, there are limits to what design standards can accomplish; as with any tool, it is important to consider these limits as well.

Effective design standards will:

- Establish clear and consistent criteria that can be applied in the review and approval process – Effective design guidelines will be useful if they can be consistently and unambiguously used to guide design and judge compliance.
- Establish a common vocabulary of terms and concepts – The terms and images used to describe the quality and character of development can vary widely. Effective design guidelines can establish a common vocabu-

lary so that all participants can consistently understand what each other are saying, portraying and meaning.

- Provide practical guidance to the design and engineering teams that will create the form of new districts – The professional teams responsible for shaping open space, infrastructure, circulation networks, sites, and buildings can benefit from clear directions and standards if they are available early in the complex work process that they must accomplish.
- Provide useful guidance to developers as they formulate the development concepts – Design guidelines can provide a helpful basis for development entities as they allocate their prospective investment. The location and character of the open space, circulation and development patterns are essential to the practical business of creating improvements.
- Convey to the community the expectations regarding the character of new development and relationships to its surroundings – Design guidelines can serve as a concise summary that demonstrates the specific local interests that will be protected and enhanced during the review and approval processes.

Design standards should not:

- Create unreasonable requirements that would reduce the ability to create high quality development – Design is a complex process involving many different elements, multiple requirements and sets of conditions. Design guidelines are intended to shape rather than define the potential for achieving sound and innovative design solutions.
- Contradict the regulation with which it is associated – Guidelines should be consistent with the spirit and content of the regulations under which they are implemented. Even if it may appear from a particular perspective that the guidelines may provide for negotiation “trade-offs” during the review process, in reality these should not be used as a negotiating tool.

Design Guidelines for the Transitional and Core Districts

The following list of guidelines is focused on the relationship of buildings and landscaping to public ways, and the visual quality of edges and views. In general, the location of buildings closer to the road over parking, the provision of landscaping buffers between non-compatible uses, and the use of high quality landscaping and building materials are encouraged. Principles are organized into five main categories: general guidelines, site planning and layout, building design, parking and loading, and signage. These are intended to supplement the Zoning Bylaw and not supplant it.

General Guidelines

- New development should work within existing elements of the neighborhood such as topography, vegetation, contextual buildings, and road layout.
- New development should not conflict with or cause loss of public and private open spaces, significant vistas, or severely restrict daylight access to adjacent buildings.
- The appearance of the front yards and side yards visible from the public ways should be attractive from both the pedestrian and roadway vantage points. This requires details for pedestrians and visual cues for vehicles.

- Site and building design should be combined to prevent large expanses of parking.
- Parking should be located behind the buildings, allowing stores and offices to front on the road, increasing the visibility of the businesses and making the road more inviting for pedestrian traffic.

Site Planning and Layout

- Buildings should be located close to the road and have entrance from public pedestrian areas.
- Buildings should be located to help form and protect public and private open space.
- Buildings at roadway intersections shall not have parking, loading or service areas at the corner, particularly at the main intersection of Routes 137 and 39. The street corner should either be a focal point for the building or treated as public and civic space.
- Property edges that face the public right-of-way shall have treatments that blend the public and private property design.
- Sidewalks, signs and lighting that improve the edge areas and encourage walking into the site are encouraged.
- Street trees and other public right of way improvements shall be designed to relate to the building and site design and not hide the businesses or store entrances.
- Pedestrian passages to rear parking areas and entrances may be relatively narrow, but must be inviting and open air. Building side windows, lighting, and landscaping shall be used to make the passageways pleasant.
- Planting of trees along sidewalks and front property lines is recommended. In general, small deciduous, flowering trees should be considered for most locations. Clusters of trees spaced at variable distances are encouraged over lines of equally distant trees.
- Plantings of different types and sizes should be provided to create a variety of New England landscapes with an informal character. A list of recommended species should be provided as part of detailed design guidelines, in which indigenous varieties appropriate to the site conditions prevalent at each location should be encouraged.
- Trees should be interspersed with shrubs and bushes. Evergreens are recommended for buffering and screening. Flowering trees should be used as design accents. Low planting materials and shrubs, preferably of flowering varieties, can be used to soften building edges and enhance pedestrian areas. Seasonal planters and flowering window boxes are encouraged, particularly for public sidewalks and sitting areas.
- Site lighting fixtures should consist of height-cutoff fixtures set at low heights (typically the bottom of the fixture should not be higher than 17 feet).
- Site utilities should be placed underground whenever feasible.
- Electrical transformers, underground utility feeds, site mechanical equip-

ment, and outdoor storage areas should be screened from public view by landscaping.

Building Design

- Building types shall relate to local and traditional New England building types for coastal communities.
- To the extent practical, buildings should be located close to the road and be ‘animated’ with architectural features, entrances, and windows that create transparency between the interior of the building and the pedestrian.
- Building façades should generally extend parallel to the public right-of-way, or follow an alignment that closely relates to the front line of the lot.
- Building entrances should be clearly recognized. Main entrances must be located on the façade facing the road and on multiple façades when fronting more than one road.
- The architectural elements of the building should be articulated to create a complex sense of scale and proportion through changes in materials, variation in the façade plane through bays, articulation of structure, ornament, or roof forms.
- Long, unbroken expanses of wall and, oppositely, random changes in proportion, materials and design must be avoided. Exterior walls longer than [60 feet] visible from public areas should be articulated with glazed openings, projections, recesses and setbacks.
- Elements within the building façades shall be proportioned for pedestrian comfort and human scale.
- The first floors shall be taller than the upper floors, and shall have storefronts or other pedestrian-oriented design elements.
- Building color patterns may vary within any building façade, but strong or bright colors should be limited to decorative elements.
- Building finish materials shall be of high quality, preferably natural wood and stone, or integrated and textured masonry. Exposed roofing materials may be asphalt shingles, clay tile, slate, concrete tile, or ribbed metal. The use of certain materials, such as concrete blocks, modular concrete panels, metal exterior panels, and vinyl siding should be avoided unless specifically approved or required.
- All side and rear walls visible to the public right-of-way or adjacent properties shall have the same or comparable quality exterior materials applied to them as the front façade.
- At least two-thirds of the ground-level frontage shall be fenestration. Reflective or darkly tinted glazing shall not be permitted.
- In general, roofs shall be simple forms and avoid excessive articulation. However, the use of turrets, dormers or skylights as design accents is encouraged.
- Rooflines shall be distinguishable as the top of the building line and shall have cornice treatments or caps, roof overhangs, stepped parapets or similar design elements.

- Rooftops should be designed in such a way that their shape and size would allow for the location of any large equipment that needs to be on top of the building. No penthouses or rooftop mechanical units shall be visible from the exterior.

Parking and Loading

These standards will supplement Section IX of the Zoning Bylaw. Any conflict will be resolved in favor of the Zoning Bylaw.

- Parking areas should be landscaped and graded to create broken vistas, so there is no panoramic view of asphalt and cars.
- Parking lots and paved areas should be screened from the road with vegetation, fences, walls and/or landscape berms.
- Screening should be accomplished by employing good quality construction materials, such as steel, cast iron fencing, brick, or stone. No chain link fencing visible from the street shall be allowed.
- When a fence is built along the front line of the lot, a 6-foot setback landscaped with bushes and low plantings should be provided along the fence.
- Parking lot design should require a maximum number of spaces that may be provided between landscaped islands and should specify the minimum acceptable size for islands and minimum size of trees.
- Sizes of parking spaces should be minimized (use a 16 foot average car length), and the total numbers of spaces should be reduced with shared parking.
- Driveway cuts should be restricted in number (one preferred) and width, dependent on truck and emergency access.
- Loading and dumpster areas should be located towards the rear of the lot, and adequate space and clearance should be provided for the maneuvering of trucks as needed.

Signage

These standards will supplement Section VII of the Zoning Bylaw. Any conflict will be resolved in favor of the Zoning Bylaw.

- Signage should advertise the name and the type of business at its location. Off-premises signs shall not be allowed.
- Signs displaying product names and logos should not be permitted unless directly associated with the principal service or products of the establishment.
- Signage should not be designed for the passing vehicles except at low speeds; meaning pedestrian-scale signs. Multiple store sites may have a single sign with limits on ladder signs.
- Color schemes that are generic and associated with the logo or standard building designs of chain operations should be modified to provide a unique design more suited to the creation of a smaller scale, village oriented environment.

- Flat wall signs are encouraged for commercial and retail uses. Freestanding ground signs are recommended for office, hotel, recreational, and multifamily residential uses. Only one freestanding ground sign should be allowed per lot. Pole signs and rooftop signs should be avoided.
- In a multiple storefront building, signage should be of a consistent location, size and material, and of harmonious color.
- In new buildings with multiple storefronts, a strong signage band should be designed just above the level of the storefront if flat wall signs are to be employed. Signs should be designed to extend across the entire sign band, yet within the vertical elements that define individual storefront bays.
- Projecting signs, meaning signs mounted on a building perpendicular to the road, may be allowed for retail uses. They should convey information in a unique way, utilizing images that visually represent the goods or services provided at the premises. A minimum clearance of 8 feet under the projecting sign should be maintained.
- Signs located above the sill of second story windows shall not be allowed, except by special flat wall signs identifying the principal user of a large commercial building. In this case, the location and size of the sign should be integrated with the building architecture subject to design review and approval.
- Signs should be made of durable materials compatible with those of the building served. Wood, metal and stone piers for ground signs are encouraged. Plastic in general is not recommended, except if used in combination with other materials, or as part of individual internally lit letters or symbols.
- Signs utilizing light-colored letters against a dark background and signs on canopy fabrics advertising the name of the business or organization are encouraged. Neon signs advertising only a business name, illuminating at a steady, even light level, are appropriate if located behind the façade glass.
- Directly illuminated signage should be from a series of gooseneck or similar extended arm fixtures, which direct light to the façade and are compatible with the design of the building. Internally lit signs will only be allowed if they consist of independently lit letters or symbols attached to the building façade.
- Exterior lighting of freestanding signs will be with ground or sign-mounted fixtures.

Additional Guidelines for the Residential District

Guidelines for residential development can also build upon the comprehensive list of design principles, while maintaining emphasis on principles that differentiate between the location and attributes of common and private areas both indoors and outdoors. For example, guidelines may include provisions to require that open space may include common and private open space, or that common open space including provisions for children’s play or adult recreation be centrally located within a new development. Within this context, building positions and orientation, fencing and landscaping could be used to maintain the privacy of residential units. Parking landscaping and screening

also become a critical element of good residential design, and should include the provision of canopy trees over parking areas and other hard surfaces that could absorb and radiate heat.

In terms of architecture, it is important that guidelines do not favor a particular building type or design style over another, but encourage the creation of high-quality, site-specific design solutions. Overall quality of design and materials should be emphasized. In the case of attached townhouses, individual dwelling units should be differentiable from each other by means of articulation of the building façades and rooflines.

Reference Section E: Potential LEED Approach

Introduction

Sustainability and 'green' building standards could be applied to the preferred development approach for East Harwich in ways that will both improve the village and reduce long-term costs to the new development and the surrounding neighborhood. This section presents background information and a potential approach to advance appropriate standards for sustainability.

The approaches rely primarily on the U.S. Green Building Council's LEED® (LEED) program. LEED is an integrated, proven design approach incorporating efficiency and long-term sustainability into buildings, with a credit system used to determine the level of improvement over standard building designs and systems.

There are two potential approaches. One is to advance the individual projects under the LEED process, and the other is to advance the village as a whole under the umbrella of sustainability advanced by the LEED program. The first approach follows the standard processes of LEED Existing Buildings, or LEED New Construction. The second is a new concept that is under development by a coalition of the US Green Building Council, the Congress for the New Urbanism, and the Natural Resources Defense Council. The new approach is being called LEED Neighborhood Design.

Leadership in Energy and Environmental Design

Leadership in Energy and Environmental Design® Green Building Rating System (LEED) is a program developed through the U.S. Green Building Council [<http://www.usgbc.org>] supported by technical committees of professionals in the fields of review. LEED is a means of evaluating and measuring achievements in sustainable design. The system presents a list of criteria for evaluation of site and building designs, allowing the accumulation of points as the design evolves and as the project is shown to meet the criteria. Generally, site design, building envelop, energy management, indoor air quality, and operations are the areas of evaluation. The designs receive point scores for meeting the LEED criteria. Higher accrued point scores result in higher certification levels, which start as Certified and move through Silver, Gold, and Platinum.

The current LEED version for new construction is Version 2.2. The key changes in the new program compared to Version 2.1 are the online options for documentation and administration as the design and construction proceeds. In addition, there is a recent LEED Application Guide¹ that highlights an approach to Multiple Building projects and Neighborhoods, both of which are potentially applicable to the future of East Harwich. The LEED Application Guides were generated from requests to facilitate campuses and larger installations and new approaches to mixed use development.

The areas of potential benefit in completing the certification program are suggested in Table 1². However, there is a more pragmatic approach to the cost/benefit analysis, which are the unit or facility cost and benefits that may accrue. There are several studies that help frame this analysis from a whole building perspective.

¹ AGMBC, October 2005

² from *Environmental Building News*, April 2005

Table 1: General Benefits of LEED

<p>First-Cost Savings</p>	<ul style="list-style-type: none"> • Streamlined permitting and approvals • Reduced infrastructure costs • Savings in construction waste disposal • Downsizing mechanical equipment • Tax credits and other incentives
<p>Reduced Operating Costs</p>	<ul style="list-style-type: none"> • Lower energy and water costs • Greater durability and fewer repairs • Lower insurance costs • Easier employee recruiting • Reduced employee turnover • Reduced liability risk • Staying ahead of regulations • Improved health and enhanced comfort • Improved worker productivity
<p>Community Benefits</p>	<ul style="list-style-type: none"> • Reduced demand on municipal services • Reduced automobile use and congestion
<p>Environmental Benefits</p>	<ul style="list-style-type: none"> • Reduced global warming impacts • Minimized ozone depletion • Reduced erosion and stormwater runoff • Reduced resource extraction impacts • Reduced toxic emissions • Reduced contributions to air pollution • Reduced local and regional water pollution • Reduced urban heat islands • Protection of biodiversity • Increased environmental awareness

Cost-Benefit Analysis

The cost factors and the long-term benefits associated with the LEED certification process have been analyzed by a number of reviewers. The three principal considerations are:

- There is a slight increased cost from adding the certification process;
- There are long-term benefits from reduced energy demand; and,
- Returns on investment are related to the level of certification, with certain caveats.

The U. S. General Services Administration reviewed the costs of LEED certification³ and determined that soft costs (design phase costs) increased from \$0.35 to \$0.59 per square foot, and that construction costs increased by 1.4% to 8.2% (\$1.78 to \$10.58) per square foot, with the higher end of the costs associated with a higher level of certification: Gold is higher than Silver, which in turn, is higher than Certified. A different cost⁴ analysis one year earlier found a similar range of additional unit costs (\$3.00 to \$5.00/square foot), suggesting that increased design costs were a deciding factor, and found that certification was possible for slightly less than 2% of the overall construction costs.

Importantly, even though total construction costs have been volatile in recent months, the costs of green design are falling significantly as the green building industry matures. For example, Seattle, Washington reported a 50% drop in costs for LEED Silver certification over their several years of study.

The intended results of the green design exercise are to reduce the impacts and longer-term operational costs of buildings. Some elements of green building design are now generally accepted as supporting reduced operations and management costs. For example, high performance glass windows can mean a 5% improvement in energy costs, fresh air circulation systems can generate up to a 20% improvement, and a computerized lighting system can provide a 10% improvement in energy demands. In fact, when sixty LEED certified buildings were compared to conventional buildings, there was an 18% to 37% energy savings in the certified buildings.

While it has also been noted that the step increase between Silver and Gold certification is usually more costly than the current return in actual energy savings (which does not regard the other values specified in Table1), the changes that have occurred within the building industry, and the greater acceptance of 'green' systems and materials will likely make the achievement of the higher standard cost effective in the near future.

Standard Approach to Sustainable Design

The standard LEED process for sustainability is an integrated systems approach that requires early consideration of the possible design improvements and frequent review in order to integrate all the building elements and systems as the design progresses.

The issue for local governments is that zoning only deals with the outer frame of buildings and not the interiors, where the most important energy efficient improvements are to be made. The Building Code deals with those interior

³ LEED® Cost Study, October 2004

⁴ Gregory Kats, Massachusetts Technology Collaborative, 2003

structural and systems elements. Consequently, communities must look to their other police powers to advance important green building goals or refine an approach that encourages participation by the development community.

The potential for LEED certification for any private project is low if only promoted by the Town. There are opportunities if the project is a public building or if the effort is made in partnership with a developer as suggested by LEED ND discussed in the next section.

Consequently:

- The standard LEED process is a reasonable starting point for procedures and review. Market forces and design improvements are making it easier to incorporate these criteria.
- LEED criteria are well established and peer-reviewed, and should be considered as guidance for the design process and design standards.
- However, unless other local powers beyond zoning are invoked, the process will be largely voluntary.

LEED Neighborhood Design Approach

As previously noted, a coalition of advocacy groups have come together to advance LEED under the terms of smart growth and new urbanist principles called LEED Neighborhood Design (LEED ND). When fully developed within the next two years, this will provide a broader approach to sustainability. As stated by the USGBC:

“This rating system will integrate the principles of smart growth, urbanism, and green building into the first national standard for neighborhood design. Whereas other LEED products focus primarily on green building practices, with only a few credits regarding site selection, LEED for Neighborhood Development will emphasize smart growth aspects and neighborhood design of development while still incorporating a selection of the most important green building practices. Guided by the Smart Growth Network’s ten principles of smart growth and the Charter for New Urbanism it will include compact design, proximity to transit, mixed use, mixed housing type, and pedestrian- and bicycle- friendly design.”

The LEED ND program is more involved and requires a greater level of analysis basically because of the addition of smart growth principles to the green building process. In terms of East Harwich, the LEED ND program will require additional efforts to achieve sustainability in the village development and redevelopment. This will require actions on the part of both the public and private sectors to provide project-specific and area-wide sustainability.

As an example, there are a number of pre-requisites necessary to obtain a LEED ND certification for East Harwich. Here are examples of alternatives that meet the pre-requisites and which are considered applicable to East Harwich from the private and public sector perspective:

“Locate the project near existing neighborhood amenities and services so that the project boundary is adjacent to existing development and located within ¼ mile walking distance of at least four or within ½ mile walking distance of at least six examples of the following uses, which must be existing and operational at the time of the project’s first application: police/fire station; bank; post office; place of worship; park; library; school; convenience

store; laundry/dry cleaner; other neighborhood-serving retail; medical/dental office; other office building or major employment center; stand-alone pharmacy; restaurant; supermarket; community or civic center.”

“Locate the project within a planned water and sewer service area, and, provide the new water and sewer infrastructure.”

The first pre-requisite above, found under Transportation Efficiency, appears to be met with the existing private and public uses found in East Harwich. The second, found under Water and Stormwater Infrastructure Efficiency, could only be met with the Town’s adoption of a wastewater district for the village center.

However, the density of development under consideration is more problematic and could impact the viability of obtaining LEED ND. Under the Prerequisite: Compact Development, the requirement is:

“Build residential components of project at an average density of seven or more dwelling units per acre of buildable land available for residential use, AND, Build commercial components of project at an average intensity of a floor area ratio of 0.50 or greater.”

While the residential unit density currently being considered allows eight units per acre, the floor area ratio (FAR) of 0.2 described in the report text would not meet this LEED ND requirement.

Consequently:

- LEED ND could significantly advance sustainable principles in the future development of East Harwich.
- LEED ND criteria will require actions from both the public and private sectors.
- Public/private partnerships with present landowners and future developers will be needed to facilitate successful completion of LEED ND.
- Greater density allowances (FAR) will be needed to advance sustainability under LEED ND.

Table 2 Summary List of Criteria and Analysis

Criterion	Possible Points	Notes
Location Efficiency (2 Prerequisites / 7 Credits / 28 Points / 25% of total points)		
Prerequisite: Transportation Efficiency	-	Achievable
Prerequisite: Water and Stormwater Infrastructure Efficiency	-	Requires wastewater district
Credit: Contaminated Brownfields Redevelopment	4	NA
Credit: High Cost Contaminated Brownfields Redevelopment	1	NA
Credit: Adjacent, Infill, or Redevelopment Site	3 to 10	Achievable
Credit: Reduced Automobile Dependence	2 to 6	Requires vehicle- sharing program
Credit: Contribution to Jobs-Housing Balance	4	Requires 50% balance of jobs to population
Credit: School Proximity	1	Requires a school within ½ mile
Credit: Access to Public Space	2	Achievable
Environmental Preservation (5 Prerequisites / 11 Credits / 13 Points / 11% of total points)		
Prerequisite: Imperiled Species and Ecological Communities	-	Achievable
Prerequisite: Parkland Preservation	-	Achievable
Prerequisite: Wetland & Water Body Protection	-	Achievable
Prerequisite: Farmland Preservation	-	Achievable
Prerequisite: Erosion & Sedimentation Control	-	Achievable
Credit: Support Off-Site Land Conservation	2	Requires TDR
Credit: Site Design for Habitat or Wetlands Conservation	1	Achievable
Credit: Restoration of Habitat or Wetlands	1	NA, or, Requires off-site mitigation

Credit: Conservation Management of Habitat or Wetlands	1	Requires on-site management plan
Credit: Steep Slope Preservation	1	Achievable
Credit: Minimize Site Disturbance During Construction	1	Achievable
Credit: Minimize Site Disturbance Through Site Design	1	Achievable
Credit: Maintain Stormwater Runoff Rates	1	Achievable
Credit: Reduce Stormwater Runoff Rates	1	Achievable
Credit: Stormwater Treatment	2	Achievable
Credit: Outdoor Hazardous Waste Pollution Prevention	1	Achievable
Compact, Complete, & Connected Neighborhoods (3 Prereq / 22 Credits / 42 Points / 37% of total points)		
Prerequisite: Open Community	-	Achievable
Prerequisite: Compact Development	-	Require FAR 0.5 minimum
Prerequisite: Diversity of Uses	-	Achievable
Credit: Compact Development	1 to 5	Requires higher FAR
Credit: Transit-Oriented Compactness	1	Requires transit stop
Credit: Diversity of Uses	1 to 3	Achievable
Credit: Housing Diversity	4	Achievable
Credit: Affordable Rental Housing	1 to 2	Achievable
Credit: Affordable For-Sale Housing	1 to 2	Achievable
Credit: Reduced Parking Footprint	2	Achievable
Credit: Community Outreach and Involvement	1	Achievable
Credit: Block Perimeter	1 to 4	Achievable

Credit: Locating Buildings to Shape Walkable Streets	1	Achievable
Credit: Designing Building Access to Shape Walkable Streets	1	Achievable
Credit: Designing Buildings to Shape Walkable Streets	1	Achievable
Credit: Comprehensively Designed Walkable Streets	2	Requires urban-style street network
Credit: Street Network	1	Requires urban-style street network
Credit: Pedestrian Network	1	Achievable
Credit: Maximize Pedestrian Experience	1	Achievable
Credit: Superior Pedestrian Experience	1 to 2	Requires urban-style street network
Credit: Applying Regional Precedents in Urbanism and Architec-	1	Achievable
Credit: Transit Subsidy	3	Achievable
Credit: Transit Amenities	1	Achievable
Credit: Access to Nearby Communities	1	Requires additional road construction
Credit: Adaptive Reuse of Historic Buildings	1 to 2	NA
Resource Efficiency (0 Prerequisites / 17 Credits / 25 Points / 22% of total points)		
Credit: Certified Green Building	1 to 5	Achievable
Credit: Energy Efficiency in Buildings	1 to 3	Achievable
Credit: Water Efficiency in Buildings	1 to 2	Achievable
Credit: Heat Island Reduction	1	Achievable
Credit: Infrastructure Energy Efficiency	1	Achievable
Credit: On-Site Power Generation	1	Achievable
Credit: On-Site Renewable Energy Sources	1	Achievable
Credit: Efficient Irrigation	1	Achievable

Credit: Greywater & Stormwater Reuse	2	Achievable
Credit: Wastewater Management	1	Achievable
Credit: Reuse of Materials	1	Achievable
Credit: Recycled Content	1	Achievable
Credit: Regionally Provided Materials	1	Achievable
Credit: Construction Waste Management	1	Achievable
Credit: Comprehensive Waste Management	1	Achievable
Credit: Light Pollution Reduction	1	Achievable
Credit: Contaminant Reduction in Brownfields Remediation	1	NA
Other (0 Prerequisites / 2 Credits / 6 Points / 5% of total points)		
Anticipated Accredited Professional Innovation Credit(s)	1 to 2	Achievable
Anticipated Innovation Credit(s)	1 to 4	Achievable
TOTAL	114	
Anticipated Certification Levels		
Certified:	46 – 56 points	
Silver:	57 – 67 points	
Gold:	68 – 90 points	
Platinum:	91 – 114 points	

Overview

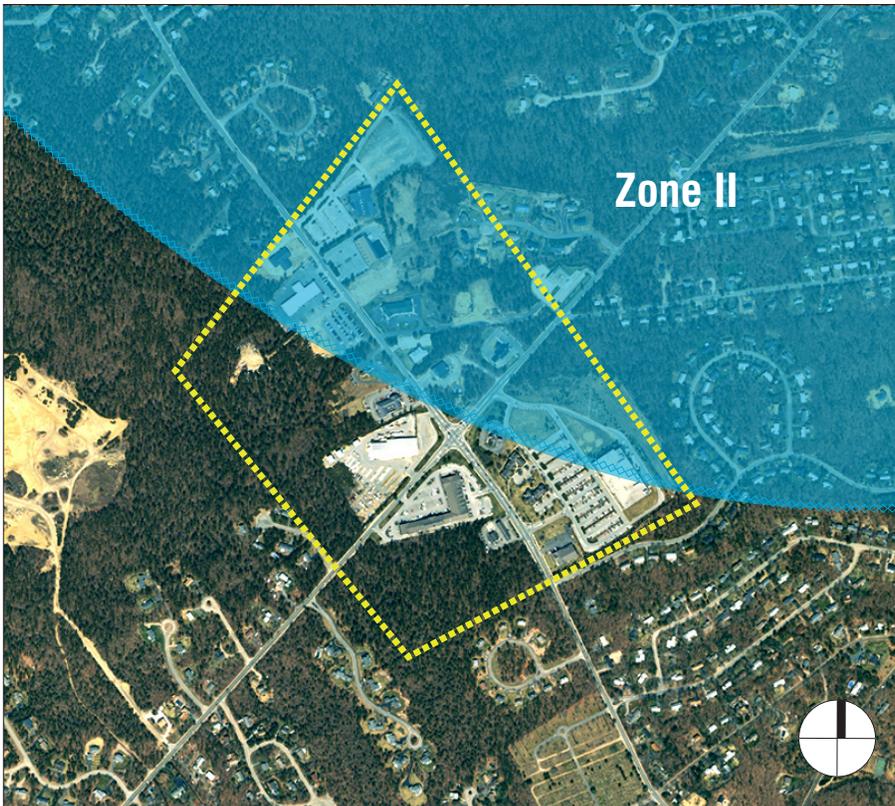
A conceptual approach for the sustainable infrastructure plan was developed for the East Harwich Village center. The concept is based upon integrated and sustainable water management. An integrated wastewater treatment system is envisioned that will significantly reduce nitrogen loading compared to the use of conventional septic systems in the area. By integrating this system with existing neighborhood residences and possibly utilizing the treated effluent as an irrigation and fertilization (fertigation) source for possible open recreation areas, existing nitrogen loading rates in the area can actually be reduced, thereby making the East Harwich Village nitrogen-neutral or better. Similarly, a sustainable approach to water balance using Low Impact Development (LID) techniques could be further developed. This element provides replenishment of the underlying aquifer and could supplement discharges to downgradient estuaries.

Wastewater

The development of village centers provides an opportunity to cost-effectively provide enhanced wastewater technology. The compact nature of village center development significantly reduces the sewer connection costs that are commonly a substantial portion of the overall wastewater treatment cost. By converting existing conventional (Title 5) septic systems in the area into the new wastewater treatment system pollutant loads can be managed to meet stringent water quality standards.

Perhaps the most significant wastewater-generated pollutant of concern for this project is nitrogen. The East Harwich Village Center is located within the watershed to Mill Creek, which has been shown to be nitrogen-limited. It is believed that nitrogen is responsible for eutrophic conditions within the estuary, exhibited by excessive growth of algae and declines in eelgrass beds that serve as impor-

Reference Section F: Sustainable Infrastructure Plan



Water Resource Protection Districts

Note: All areas shown are in the Water Resource Protection District

tant habitat for shellfish. In extreme conditions eutrophication can result in anoxic conditions, fish kills and foul odors. A recent report prepared for the Massachusetts Estuary Project suggests that the Mill Creek estuary is already over-capacity with respect to nitrogen loading (MADEP, 206). That report estimates that nitrogen loading would need to be reduced by almost 75% from existing conditions to achieve a healthy water quality standard. The report does not account for growth implications in its calculations. Our preliminary calculations suggest that the proposed build out scenario for the Village Center area would absorb approximately 2/3 the allowable nitrogen for Lower Muddy Creek. Overall these statistics suggest that, even under existing conditions, some type of nutrient trading program would be needed to bring our sub-basin into compliance. The use of conservation restrictions, transfer of development rights, and additional sewerage elsewhere in the system could be used to offset the already challenging situation in our area.

Based upon the critical status of nitrogen loading in the Mill Creek Estuary, we have established an objective of a “net-zero” nitrogen loading for the design of the East Harwich Village Center. This means that any future devel-

opment in this area cannot cause any net increase in nitrogen loading. It is also possible that the village treatment plant could actually reduce existing nitrogen loading levels by limiting the magnitude of the expansion of the village center and using state-of-the-art wastewater treatment.

Generally speaking, wastewater treatment plants (WWTPs) produce effluent that has nitrogen loads that are approximately one-seventh that of conventional (Title 5) septic systems. Most current WWTPs achieve effluent with an average concentration of 5 mg/liter of nitrogen, compared to an average Title 5 effluent quality of 35 mg/liter nitrogen. Therefore each Title 5 system in the East Harwich area that is ultimately connected to the proposed sewage treatment system represents a net reduction in nitrogen loading.

To evaluate the benefits of a village-scale wastewater treatment system for the East Harwich Village, the team calculated existing and future nitrogen loading for each lot within the CH-2 Boundary, based upon building intensities provided in this study. Massachusetts DEP Title 5 standard wastewater flows were assigned for each type of use. A nitrogen loading rate of 35 mg/L was assumed for



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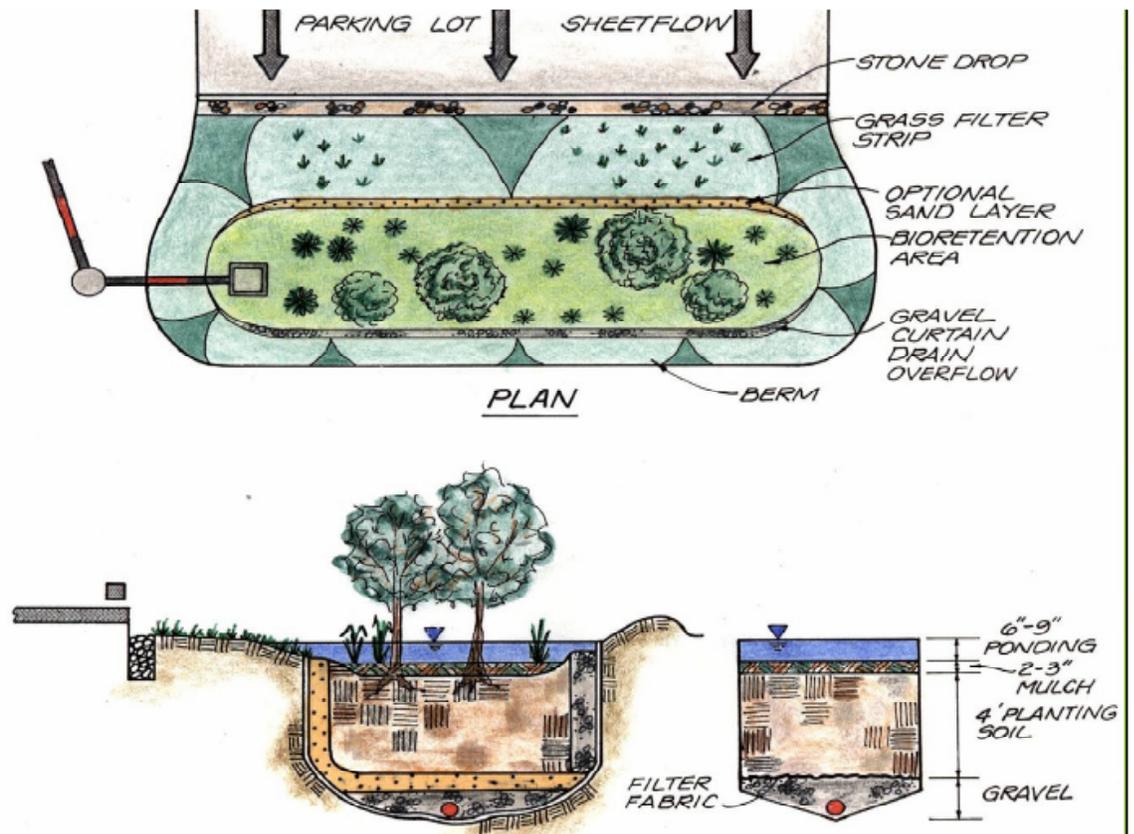
septic flow, and a 5 mg/L rate was assumed for wastewater treated at a tertiary wastewater treatment plant.

In existing conditions, all of the uses are serviced by septic systems except for the Stop & Shop, which has its own wastewater treatment plant; this results in a total nitrogen load of 1,327 lbs N per year. The consultant team proposes that all of the wastewater, from existing and buildout development, be routed to a treatment plant in future conditions. This would result in an annual load of 1,122 lbs N per year, a 15% reduction from existing conditions. Further nitrogen reduction is feasible if some of the surrounding residential neighborhoods are connected to the village treatment system. Each additional single family home converted would further reduce nitrogen load to the down-gradient estuary by approximately 10 lbs/year. On-site septic systems are seen as a significant contributor of nutrients to the Pleasant Bay

system at approximately 21% and a centralized wastewater treatment is identified as one of the most effective means of mitigating this problem.

Another measure that could further reduce nitrogen loading would be to utilize the treated effluent as a fertigation source. This could be applied to landscaping areas throughout the village area and /or on potential recreation areas, such as play fields or a golf course, in the area.

In summary, the proposed development scenario represents a net improvement with regard to nutrient loading conditions in the Lower Muddy Creek subwatershed and the Pleasant Bay as a whole. It does not, and could not, solve the bigger picture problem for the subwatershed or the Pleasant Bay system as a whole. Outside of sewerage the entire subwatershed, the most effective way to address this is through a potential nutrient trading strategy.



Water Balance

Another issue with respect to sustainability deals with water balance, or hydrology – and recognizes that future development scenarios should strive to balance the amount of water that is returned to the underlying groundwater system. There are three elements of design for which public policy can provide significant improvements; Groundwater Recharge, Rooftop Runoff, Paved Area Runoff, for which Low Impact Development design.

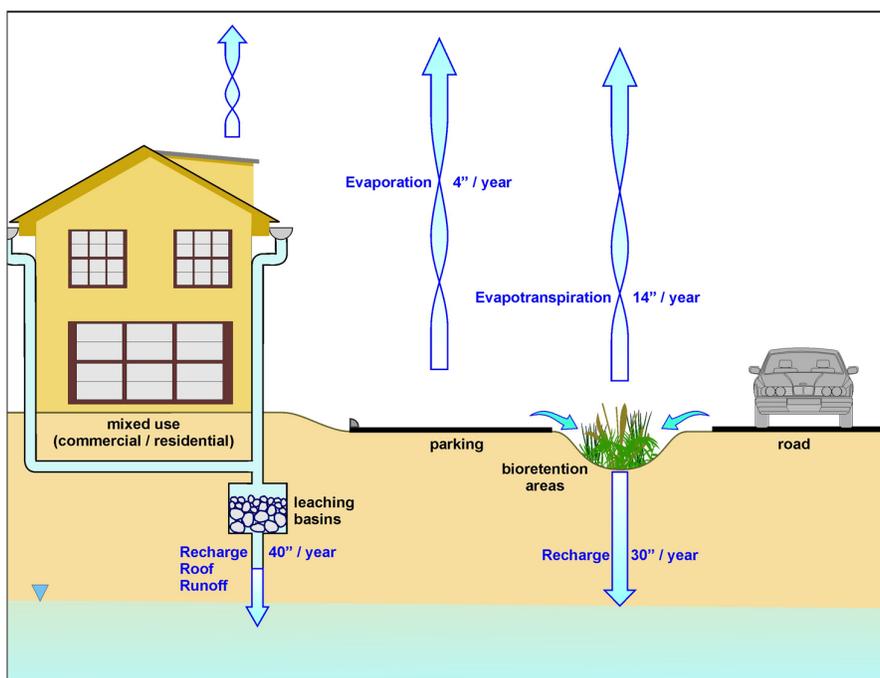
Groundwater Recharge (Hydrologic Balance):

The hydrologic balance should be improved for two reasons. First, the underlying aquifer must be replenished to ensure a long-term water supply. Secondly, water quality conditions in the Muddy Creek estuary are dependant upon freshwater discharges and the flushing rate. Changes in the groundwater recharge rate within the watershed are directly related to the flushing rate of the estuary.

Low Impact Development (LID) techniques can be used to balance the

hydrologic budget. The total groundwater recharge was calculated for natural and future conditions based upon expected consumptive uses and feasible infiltration rates. Natural conditions were chosen for the baseline analysis, rather than existing conditions, because consumption in the future development can be offset by increased rainwater (stormwater) infiltration using LID Best Management Practices (BMPs), and the consultant team believes that the development may be able to sustain the natural groundwater recharge rate. Annual precipitation for the area averages 43 inches of rain per year. A natural recharge rate of 20 inches per year is estimated over the entirety of the 122-acre site, resulting in an annual recharge volume of 204 acre-feet.

Increased (post-development) infiltration rates can be achieved using a range of LID techniques. For this project two systems are recommended: a) direct infiltration of rooftop runoff and b) water quality treatment of runoff from roads and parking lots using bioretention systems, followed by infiltration/runoff.



Rooftop Runoff:

Rooftop runoff is generally considered to be of good quality. The current Massachusetts Stormwater Policy allows for direct infiltration of rooftop runoff. Infiltration systems such as dry wells are attached to rooftop gutters and can infiltrate any rainwater not lost to abstraction (ponding and subsequent evaporation), and will typically achieve 40 inches per year. Infiltration basins or subsurface infiltration chambers can also be designed to infiltrate and recharge this runoff.

Parking Lot/Road Runoff:

Stormwater runoff from parking lots and roads contains significant levels of pollutants including petroleum hydrocarbons, metals and pathogens. To provide effective treatment of these pollutants, bioretention systems are recommended, followed by infiltration. According to recent studies reported by the University of New Hampshire Stormwater Cen-

ter, bioretention is highly effective at removing these types of pollutants. Bioretention systems are engineered structures that filter stormwater subsurface through a soil media that is planted with a mixture of species that can withstand alternating wet and dry conditions. These systems can be lined or unlined but treated water is infiltrated to the subsurface and eventually to the groundwater.

Benefits

To determine the effectiveness of using LID practices in the East Harwich Village Center, the consultant team calculated the total area covered by roads, parking lots and rooftops based upon the concept plan. Rooftop areas were calculated assuming that all structures, except the Stop and Shop, are two stories tall. Parking areas were calculated in accordance with the existing zoning requirements. Remaining areas were assumed to have the same infiltration rate as in natural conditions. The total possible infiltration rate in future conditions is estimated to be 238 acre-feet. This represents a net increase of approximately 17 % compared to natural conditions.

Overview

It is commonly reported that the production and emission of so-called “greenhouse gases,” and in particular carbon dioxide, is creating adverse climatic conditions that have an impact on global ecosystems and the quality of life for humans.

- Reduction in carbon use and emissions
- Off sets for non-reducible carbon use
- Metrics and performance standards

Reduction in Energy Consumption

The consultant team calculated existing and future energy consumption based upon demand coefficients, for residential, retail (including the super market and the movie theater), office and health care uses, provided by the Energy Information Association (EIA). Existing consumption in the East Harwich CH-2 Zoning District was estimated to be 9.12 megawatts per year. Projections for the total demand of the future buildout totaled 18.14 megawatts per year, a 99% increase.

However, this figure is realized only if all future buildings are constructed according to conventional standards and no improvements are made in energy or electrical efficiency. If all new buildings were built according to USGBC LEED® criteria (see Reference: LEED), and any existing structures that were preserved in the final buildout were also retrofitted according to these criteria, a 30%, or better, reduction in energy demand is feasible (Conservation Center). Such a reduction would result in a total demand of 12.70 megawatts per year, or an increase of only 39% over existing conditions, as compared to the 99% increase without such measures.

It is important to note that building energy consumption is only one part

of the larger picture of energy consumption and carbon production. Transportation is equally influential, and a mixed-use, pedestrian friendly development such as the proposed East Harwich Village Center buildout offers a number of opportunities for reduced energy consumption in this area over a comparable conventional development.

A mixed-use, compact, pedestrian-friendly development versus the level of carbon emissions generated by typical, sprawling development will result in vehicle trip reductions, further reducing energy demands and carbon emissions. Further research and analysis is required to quantify these benefits.

Offsets for Carbon Emissions

The most commonly used method for offsetting carbon emissions is the preservation or planting of trees and forests. Forests can be important in carbon balance for several reasons:

- About 2.5 acres (one hectare) of forest can absorb the equivalent emissions of 100 passenger cars, and 2.67 trees absorbs 1 ton of carbon dioxide (Trees for cities, <http://www.treesforcities.org>). This suggests that the 275 acres of forested RR-zoned residential land (after discounting developed and non-vegetated land) could balance the yearly emissions of 1800 cars.
- Trees planted along travel ways can reduce vehicle emissions by removing sulphur dioxide and reducing particulates by up to 75% (Johnston and Newton, London Ecology Unit). This is another reason to redesign the roadways as tree-lined and as boulevards.
- A single full-grown (beech) tree can be equivalent to five room air conditioners and will supply enough oxygen for ten people (Johnston and Newton, and Trees for cities).

Reference Section G: Carbon Balance

- Vegetation around building elements to create shade and block winds can potentially reduce heating requirements by up to 25% (Town and Country Planning Association). This suggests that the site design standards for new construction include requirements for locations of landscape plantings to accomplish this benefit.

Some environmental organizations are suggesting that to provide the proper balance, the mitigation must include the planting of new vegetation rather than just the preservation of existing trees. In addition, different tree species have different capabilities in carbon sequestering. Consequently, the concept of improving the vegetative stand in both the preserved and developed areas will be required to attain a real balance.

Metrics and Performance Standards

There are several ways to determine the carbon demand and balance of a project. The Beddington Zero (Fossil) Energy Development, BedZED, built by the BioRegional Development Group in Beddington, England is the first project to define some parameters and methodology for determining and balancing the impact of development on a regional scale. To calculate impacts and savings, the BedZED project used:

- Embodied energy savings in the materials used – found in the energy required to obtain, process, manufacture and deliver materials used in construction;
- Embodied CO₂ savings – dependent on the specific energy sources used in the project;
- Minimized eco-footprint – relating to an area of land necessary to support a product or population.

Much of the savings in construction are found in using local materials, reclaimed materials, recycled materi-

als, and products manufactured from sustainable materials. The eco-footprint savings come from attention to all the design elements, as well as the operations and maintenance of the project, and the lifestyles of the inhabitants. The most common response to eco-footprint savings is to obtain an off-set for carbon emissions (see above).

Application

While communities in Massachusetts are not yet empowered to create local land use regulations that require such design considerations, local public policies can be adopted to encourage consideration of sustainable design criteria. In addition, where a partnership with a local developer may be contemplated, some of these criteria could become part of the public-private agreement.

Reference Section H: Floor Area Ratio

Overview

Floor Area Ratio is the sum of a building's floor space compared to the area of land on which it is built. The lot that defines the area of land is typically set by subdivision, while the building area is based on the footprint and number of stories. The building area may also vary depending on whether the calculation is based on net usable area (livable space) or gross area (outside wall to outside wall) of the building.

A simple way of looking at Floor Area Ratio (FAR) is to consider a lot of X square feet in size. If a building is built on the site that fully covers the site, that is the building is also X square feet, the FAR is X divided by X or 1.0. This would be the case if the lot was say 10,000 square feet and the building was also 10,000 square feet in area. However, there would be no room on the lot for anything else including parking.

If the building is built to cover only half the site, the building is $\frac{1}{2}$ X and the FAR is than $\frac{1}{2}$ X divided by X or 0.5. In this case our lot is 10,000 square feet and the building is 5,000 sq feet. However, if the building covers only half the site but has a full second story, the floor area is now twice as great (two stories of 5,000 square feet equals 10,000 square feet) and the FAR is again 1.0, with room on the lot for supporting uses such as parking. Similarly a building that is only one floor and covers 25% of the site would have an FAR of 0.25, and a one-story building that covers 20% of a site would have an FAR of 0.2.

For examples within the East Harwich Village center, we can consider the original Stop and Shop building and the Hinckley Home Center as approximately equivalent to an FAR of 0.2, while the new Stop and Shop is approximately equivalent to an FAR of 0.25. This is part of the reason that the project proponents obtained additional land to be preserved as open space.

Typically, zoning defines the potential building on a site by describing the outer framework of the structure. The standards may include maximum height, minimum or maximum setbacks from lots lines, and total coverage restrictions that require a building to fit within those dimensions. Adding requirements such as parking and landscaping increases the site usage and may further restrict the building dimensions.

FAR allows that a building may be tall with a smaller footprint, or short and more spread out over the land, but this building form will always have the same maximum ratio of total floor space to land area. In this way FAR is a more flexible dimensional requirement. To be most effective in providing high quality development, FAR should be combined with Design Guidelines and Performance Standards (See Reference: Character of Design), so that the resulting project follows the rules that define local design character.

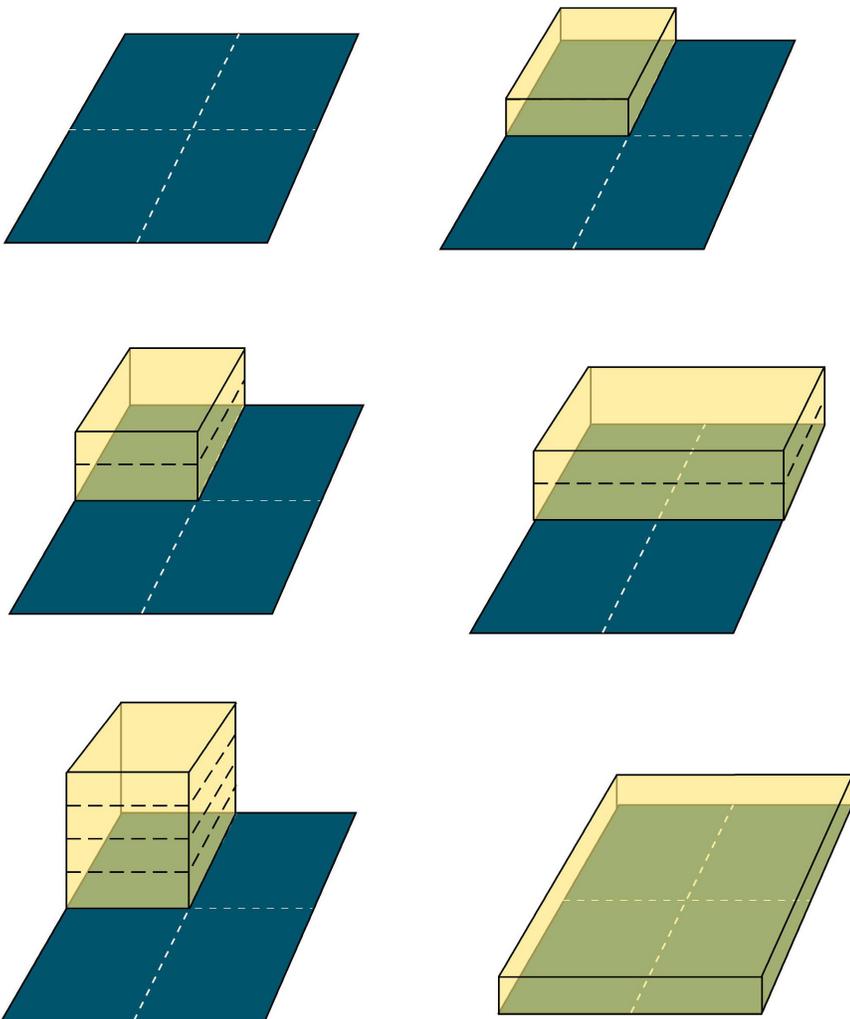
Comparisons of Floor Area Ratios

The Metropolitan Area Planning Commission completed a study of their 101 member cities and towns to review the existing FAR standards that have been developed in town centers throughout their region. The FAR ratios on the highest and lowest end of the range of ratios, found in rural and low-density suburban locations, was above 2.0 and below 0.2, respectively.

The coverage allowances within the Harwich Zoning Bylaw for the East Harwich watershed area, restrict the lot coverage to about 0.1 for the building footprint. With a two story building allowance, this coverage would allow an FAR of about 0.2. For comparison with existing buildings in the East Harwich Village, the original construction of the Stop and Shop building and the existing Hinkley Home Center have FARs that are approximately 0.2.

Comparison with New Urbanist LEED Standards

The LEED® Neighborhood Design criteria for certification (See Reference: LEED) are being developed as a melding of new urbanist, smart growth standards and LEED® criteria. Within those standards an FAR of 0.5 is seen as the minimum standard for certification under this particular program. As defined, this would exceed the allowances proposed for the East Harwich Village Center. However, the recommendation is to consider a redistribution of intensive development into a smaller zone to allow more compact development that still meets overall development restrictions for protection of the groundwater and watershed.



Reference Section I: Background and Analysis

East Harwich Village Study

Findings Memorandum

June 20, 2006

Introduction

This memorandum summarizes key findings from the consultant team's initial review of the East Harwich Village Center. The team is composed of the Cecil Group, Horsley Witten Group, and FXM Associates. The team reviewed and recorded land use patterns in photographs, studied the regulatory requirements and potential buildout, reviewed regional groundwater resources and restrictions, reviewed previous studies and existing conditions regarding road and utility infrastructure, and obtained certain real estate market data to help formulate ideas on the limitations and opportunities for positive change in East Harwich. In accordance with the Scope of Services for the study, the following steps were also used to help define conditions in the study area:

- Collection and analysis of information from the Assessors' database, Cape Cod Commission, and local and state agencies regarding parcel ownerships, regulations, natural resources, traffic, and infrastructure;
- Site walkovers and observations on property made available for access, otherwise, aerial photos and mapping will be used to generate site specific information;
- Review and critique of the buildout analysis, with additional analysis made as necessary to refine the findings for the locus;
- Review of local planning documents and regulations for applicability and restrictions to village concepts of development;
- Review of historical documents and photos; and,
- Interviews with key stakeholders.

The intent is to use the information collected and analyzed in this task to inform subsequent steps in the study.

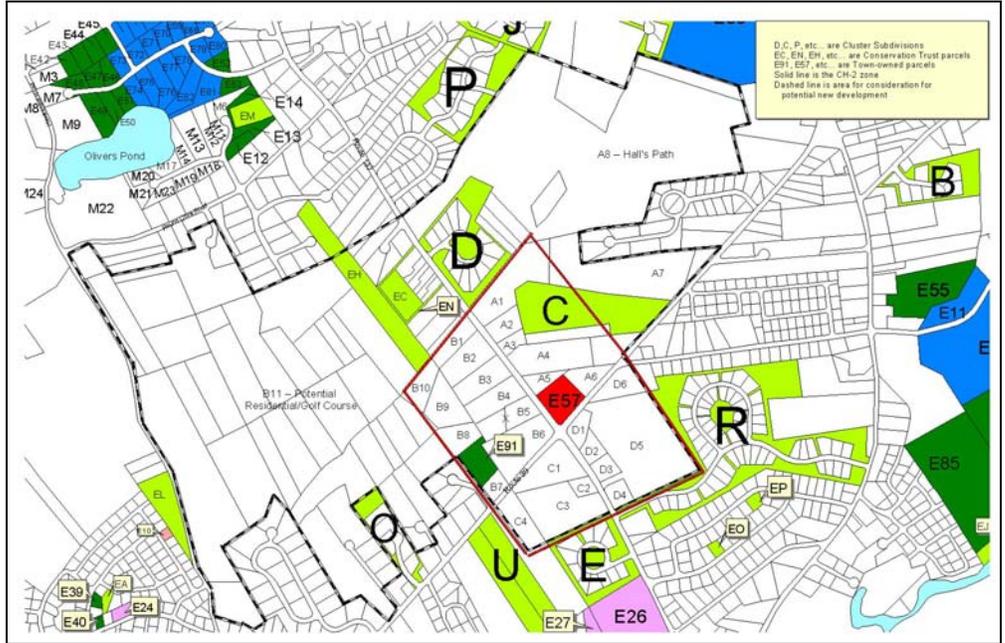
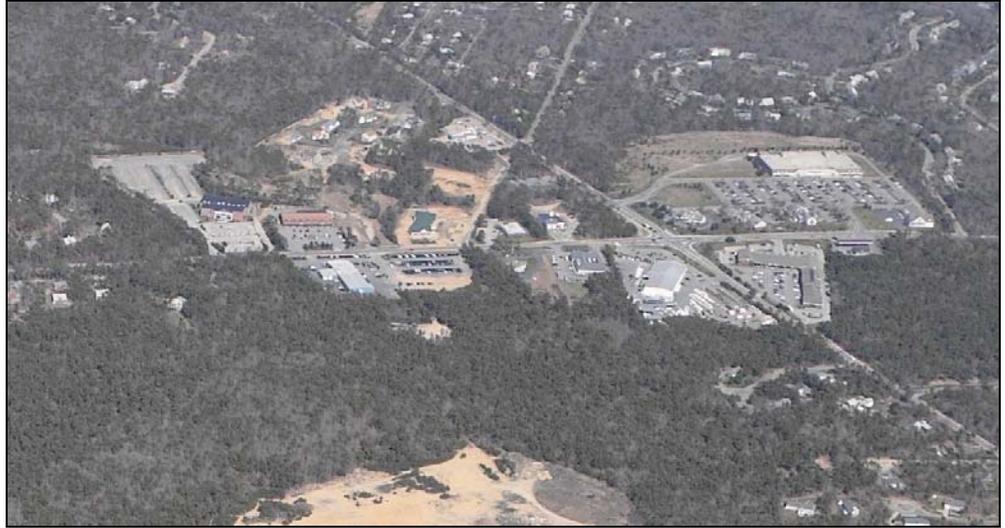
Locus

The East Harwich Village Center study area is shown in Figure 1. It includes the CH-2 zoned area around the intersection of routes 137 and 39, and the adjacent undeveloped residential land. The land area within the CH-2 zoning district is approximately 113 acres. The adjoining open residential land is approximately 210 acres on the western side and 116 acres on the eastern side of the district.

Locus - Key Findings:

- The locus provides over 100 acres for development and redevelopment, with mixed use development, which could create an urbanized center.
- The Assessors' records provide a different (smaller) area than calculated by the geometry of the locus. The discrepancy does not impact basic land use decisions for a master plan, but should be resolved for the purposes of taxation.

Figure 1. Study Area Locus



Historical Precedents

The history of Harwich commerce has been recorded in several ways. The aspect that we are interested in is the physical development that was (and still is to some extent) manifested in the buildings and town centers. These facilities provided the focus of activity that maintained the vitality of the town and allowed it to grow.

In review of the historical building photographs, and noting the examples that survive today, it can be seen that the town found a significant architectural presence in their commercial and civic buildings. The grand scale and strong presence of the Exchange Building, Brooks Academy, and what is the current Town Library, speak to the concept that people held at the time of the importance of local commerce – and the need to accommodate it within functional buildings.

Precedents - Key Findings:

- The Town's history reveals that commercial interests have created a wide variety of building architecture.
- Although the historic buildings have been large in some cases, the form was based on the functional requirements of the time.

Recent History

The East Harwich CH-2 zone is fairly recently developed as a regional center for commerce. Land development in this region of Cape Cod advanced following the construction of Route 6 and the improvement of local and numbered roads within the area. The intersection of Route 137/Brewster-Chatham Road with Route 6 was a key to the development of the commercial land in East Harwich.

Oral history from long-term residents suggests that the construction of the East Harwich Fire Station 2 in 1976 at the intersection of the highways was one of the first non-residential projects in the area. If the fire station was the first such project, then during the 23 years from 1976 to 1999, over 200,000 sq ft of commercial development followed. This volume of commercial space is large enough to identify this location as a regional commercial center. Specifically, this volume of commercial space must serve more than the local neighborhood to remain viable.

It not only has been viable, it has thrived. Within the last six years there has been about a 50% increase in the amount of commercial space, going from just over 213,000 sq ft in 1999 to over 300,000 sq ft of commercial building floor area today. New development and expansions have both been part of this growth. The result is that this location is one of the largest and most important commercial centers on Cape Cod, competing for regional attention with the Cape Cod Mall.

Recent commercial building types are often single-story buildings with varying heights but most often sloped rooflines, centered within the property to accommodate zoning setbacks, parking and access, the latter oriented to vehicle access. Pedestrians are typically provided walkways linking parking areas and entrances. Additional information can be obtained from the photographs attached to this memorandum.

Recent Development - Key Findings:

- The locus is now a regional shopping district.
- The speed at which the area is developing is increasing.
- The newest development is better quality but still auto-oriented.

Groundwater Resources

The study area is located within a town-designated Water Resources Protection Area and a Zone 2 wellhead protection area. According to a more recent report prepared for the town, the site is not within the “contributing areas” to the public supply wells as modeled under average climatic conditions (rainfall and recharge). The Zone 2 analysis was conducted using conservative (180-day no recharge) assumptions required by the Massachusetts DEP.

Equally important, and perhaps a more significant constraint is the fact that the study area is also located within a recharge area to a marine embayment (see Figure 2). Under current hydrologic conditions, ground water underlying the study area flows southeasterly and discharges to the Muddy River which in turn flows into the Pleasant Bay estuarine system. Marine and estuarine waters such as this are very sensitive to nitrogen loading at low concentrations (0.25 – 0.75 mg/liter).

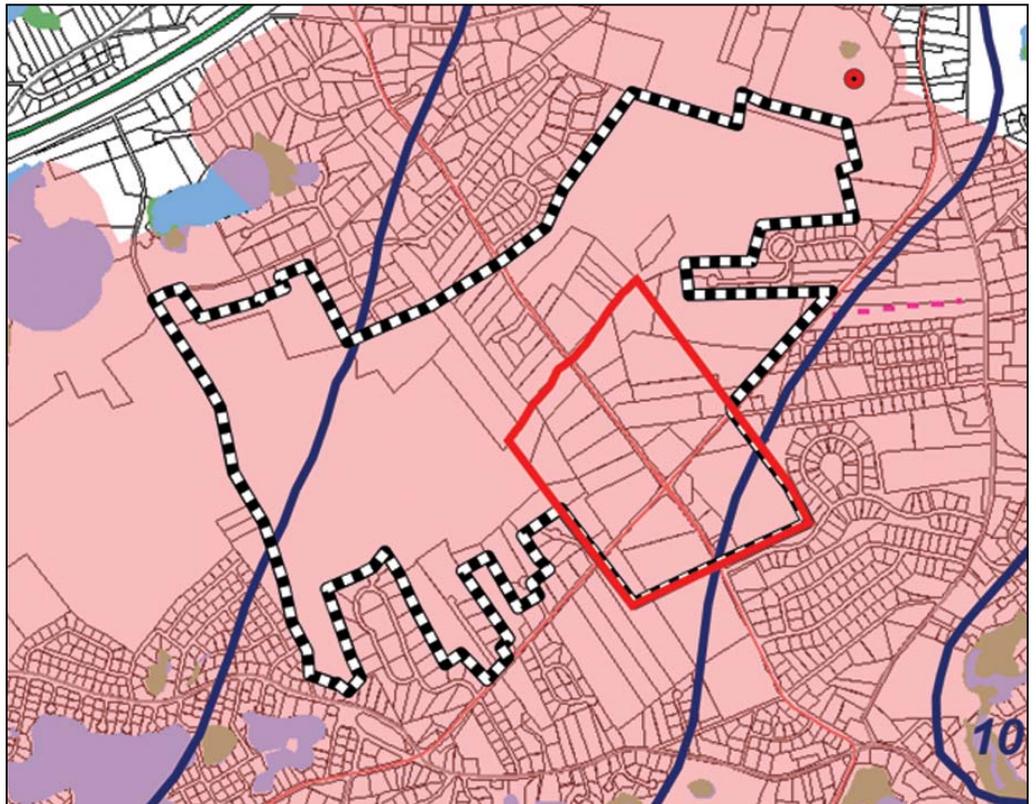


Figure 2. Groundwater Contours

Groundwater -Key Findings:

- The locus is within a Zone 2, but not within the ‘contributing area’ to a public water supply.
- The locus lies over a recharge area for an important marine embayment.
- Land use must meet a higher water quality for nitrogen loading to preserve

Wastewater Disposal

The study area is currently served on-site septic systems (Title 5) with the exception of a small sewage treatment plant (for the Super Stop and Shop supermarket) and a denitrifying septic system (for the 400 Club restaurant). Standard Title 5 systems discharge an effluent that contains approximately 40 – 60 mg/liter of nitrogen. Denitrifying septics can achieve an effluent concentration of 19 mg/liter and small sewage treatment plants can reduce these concentrations to below 10 mg/liter.

Given the sensitivity of the Muddy River/Pleasant Bay estuary to nitrogen loading, future development plans to the study area must include state-of-the-art wastewater treatment and integrated water management to minimize and perhaps reduce future nitrogen loading to groundwater (and ultimately the estuary).

A village-scale wastewater treatment plant is likely to be cost-effective for the study area. The cost-per unit decreases with density, as a significant part of the wastewater infrastructure is the sewer lines that convey the sewage. A village-scale system could also provide service to adjacent residential areas, replacing existing (and aging) Title 5 systems. This would result in approximately a 5:1 benefit in reducing nitrogen loading from these areas. This reduction could be used to offset potential new development in the village center/study area, possibly achieving a no-net increase in nitrogen loading.

An additional measure worth considering is the installation of irrigation wells downgradient of village-scale wastewater treatment plant, to re-capture the nitrogen discharged to ground water and re-using this as irrigation water for landscaping throughout the village center and possibly at a golf course which is being discussed to the west of the study area. This would result in a further reduction in nitrogen loading and could lead to an overall net reduction in nitrogen loading to the estuary.

Wastewater - Key Findings:

- New technologies and methods will allow development to continue, but actually reduce the wastewater impacts.
- Combined systems will be required to accomplish the improved discharge.

Roads and Traffic

The Cape Cod Commission completed a study entitled *CH-2 Planning Study* of the district in 1999. The traffic study was based on a buildout of the CH-2 district provided by the Town. The study noted “considerable traffic impacts” from the

buildout. With about one additional vehicle for every 20 sq ft of commercial space, the study found that ten additional turning lanes or a roundabout at the 137/39 intersection would be required to maintain the intersection at its current level of operation.

The recommended alternatives were:

- First, to consider purchase of the undeveloped land to create open space and reduce future construction;
- Second, to consider the construction of the roundabout, similar to recent construction of the newest roundabout in Harwich.

Both of these options remain available to the Town. With experience at the new roundabout, the residents can now make a more informed decision on whether this location warrants the same design option.

Also considered in this study was the creation of a grid road system, with improved bicycle and pedestrian service, to relieve pressure on the main intersection of Rts 137 and 39. Construction of the grid requires further development of the land, or public funds for construction. A District Increment Financing plan could be used to raise the necessary funds.

Traffic - Key Findings:

- Traffic will continue to grow, creating more congestion.
- Mitigation is possible through new road construction and existing road improvements, or purchase of the land to restrict further development.

Existing Land Use

Existing land use is clearly based on the ownership patterns and regulatory constraints. For the most part buildings sit alone within the center of their parcels, and the locations and sizes conform to the zoning and other land use regulations in place.

The individual building forms and overall organization are more in line with an auto-oriented design than with a historic village center. The architecture is for the most part reasonable given the expectations of the current market, but it still leaves room for improvement. However, it is the layout and organization of the development that do little to reinforce connectivity, circulation and walkability of the area. The one exception is within the development of the Stop & Shop quadrant that lays out parking and buildings within typical walking distances and accommodates pedestrian movement to some extent with walkways. However, this quadrant does not directly relate to the other areas in the CH-2 district.

Including recent projects built or under construction; i.e. not just proposed or in permitting, there are 299,981 sq ft of commercial space in the CH-2 district. The building types vary significantly in age, size and quality. A photographic review is attached to this memorandum.

Land Use - Key Findings:

- The types of development vary significantly, which is considered beneficial to creating an interesting village center.
- The quality of development varies significantly, which is considered a detriment to creating an attractive village center.
- The development is, for the most part, auto-oriented and not pedestrian friendly, and limits interaction between properties.

Potential Buildout

Several studies of potential buildout under zoning have been completed over the last few years. Two studies reviewed for this project include the *CH-2 Planning Study* prepared by the Cape Cod Commission in 1999 with worksheets provided by the Town Planner. The study estimated an additional 500,000 sq ft of development, which would result in a total of over 730,000 sq ft of commercial development.

The East Harwich Village Association prepared an analysis of buildout with assistance from the Town Planner, as one of the first steps leading to this current study. This analysis projects commercial growth of over 929,000 sq ft, for a total of about 1.2 million sq ft of space, and the additional potential development of residential units with a total of 403 bedrooms could be built in the district. With an estimated average size of 700 sq ft per unit, 403 one-bedroom units would be equivalent to an additional 280,000 sq ft of floor space above the commercial space, creating about 1.2 million sq ft of building.

For this analysis, the consultant team approached the analysis in two ways. The first was an analysis of the zoning and permitted building envelope. Because the map files provided to the consultant team have more acreage within the CH-2 zone than shown on the Assessor's records, the mathematical calculation of buildout was greater than the most recent buildout study (1.32 million sq ft compared to 1.23 million sq ft). However, this was refined with the additional analysis of site design requirements for parking, which is needed for every project. Based on this analysis, again a simple mathematical calculation, the total amount of space after buildout was calculated to be approximately 890,000 sq ft.

The second method was to create a potential design of the maximum development to better understand the actual requirements of the site and how typical building forms, parking and access would work within the boundaries of the CH-2 district. Based on this more detailed analysis, approximately 850,000 sq ft of commercial and residential space could be created. With the right set of circumstances, this means the district could more than double in size, with the right set of circumstances being:

- ❑ New road access is provided to the land areas furthest from the highways;
- ❑ Access and parking is shared;
- ❑ Market demographics continue to grow to match the demand for goods and services;
- ❑ Competition from other commercial centers in Harwich and surrounding communities does not change significantly.

As suggested by this analysis, the existing CH-2 zoning does not provide a very ‘fine-grained’ envelope in which to frame development. If the town wishes to develop more exacting public policy on the future of the area, additional design guidelines and performance standards should be considered.

Buildout - Key Findings:

- The CH-2 zoning is not highly restrictive in terms of total development possible in the district.
- The potential buildout is over 1 million square feet or more than three times as much as exists today.

Information from Property Owners

Meetings were held with principals from two development companies with properties in the CH-2 area to gain a better understanding of the anticipated direction of future development. As expected, new development will continue in similar fashion until and unless changes impact the development community such as new market demands or changes in land use and environmental regulations. Importantly, it was noted that new and innovative ideas would be fully considered to determine whether they provided better means to approach the development process and value of the development.

Developer Interest - Key Findings:

- Further development of the locus for commercial and residential construction, supported with appropriate regulation, is desired.

Market Indicators

Success as a regional center has been attained as evidenced by full occupancy of existing space. The accessibility (travel times) of the location to year round and seasonal residents has been, and will continue to be, an important factor in determining future potential, as well as market growth and the relative strength of existing and prospective uses compared to regional competitors. The expansion of the anchor Stop & Shop supermarket may influence the choices of other retailers.

The architectural and urban design quality of the center to create a shopping experience can be very important. The information on sales within the Talbots stores on Cape Cod (see Table 1) shows the Mashpee Commons store is performing better than the other two. Mashpee Commons central location to a broader and deeper resident market is also an important factor, but does not explain the difference with the Cape Cod Mall.

Mashpee Commons has been developed as a “new town center” and creates an enjoyable shopping experience, which has been proven by the sales. Talbots and other major retailers are now recognizing this interest for a better shopping experience and are seeking locations at shopping centers that are built with these design principles.

There is another interesting aspect to these numbers showing that the East Harwich Talbots is performing slightly better than the Cape Cod Mall. This may be a favorable indicator for continued success of the East Harwich commercial center.

Table 1: Comparative Sales at Regional Talbots Stores

Location	Year Built	Sales/Sq Ft
Harwich	1995	\$449
Cape Cod Mall	1998	\$431
Mashpee Commons	2000	\$529

Source: Talbots

It is important to note that the quality of the shopping options in the Talbots/Stop & Shop quadrant is not uniform across the district. Even more important is that a commonality of good design within a walkable shopping district has not been fully established in this CH-2 district.

The potential for additional retail stores is indicated in Table 2. This shows selected retail opportunities, based on analysis of year-round and seasonal consumer demand and reported store sales within 10, 20, and 30-minute drive times of the CH-2 commercial area. The analysis is based on 2005 conditions, which are the latest available data for spending potential and store sales and does not consider pending or future retail development within the identified trade areas. The “opportunity gap,” or leakage, is the difference between spending potential within the trade area and actual store sales within the same trade area. The calculations of supportable square footage and number of stores are based on median sales per square foot and median store sizes for the retailing types identified in the table, with sources noted in the Table. Neither growth in demand or supply has been factored into this limited analysis, nor have land prices and rents in potentially competing locations.

Within these limitations, it may be instructive to note that over 900,000 square feet of retail space, comprising 150 stores at median store sizes for the opportunities identified, could be supported in the study area under current market conditions. This very interestingly is the approximate amount of commercial development available under the present zoning.

Market - Key Findings:

- The retailers at this locus are enjoying the benefits of a regional center, but are not reaping the full benefits that newer commercial center concepts appear to provide.
- The gap analysis shows a substantial opportunity to expand the retail base *commensurate with the potential buildout under zoning.*

East Harwich Village Study
Supportable Retail Activity: Selected Opportunities

Store Types with NAICS code	Estimated Trade Area	Opportunity Gap (Leakage)	Median Sales Per Sq. Foot	Supportable Sq. Footage	Median Store Size	No. Supportable Stores
Retail						
Furniture Stores-4421	30 minutes	\$ 9,631,742	\$224.68	42,869	4,916	9
Radio, Television, Electronics Stores-443112	30 minutes	\$ 23,174,934	\$224.29	103,326	5,463	19
Computer and Software Stores-44312	30 minutes	\$ 15,253,196	\$535.92	28,462	1,500	19
Specialty Food Stores-4452	20 minutes	\$ 4,253,334	\$276.79	15,367	2,340	7
Men's Clothing Stores-44811	20 minutes	\$ 2,441,582	\$185.37	13,171	3,500	4
Jewelry-44831	10 minutes	\$ 1,748,590	\$445.74	3,923	1,500	3
Sporting Goods-45111	10 minutes	\$ 1,375,990	\$218.64	9,696	1,500	6
Hobby, Toys and games	10 minutes	\$ 2,120,026	\$152.51	15,628	1,500	10
Book, Periodical, Music Stores-4512	10 minutes	\$ 2,383,388	\$155.38	15,339	1,500	10
Department Stores 4521	10 minutes	\$ 55,829,050	\$118.24	472,167	30,000	16
All other Gen'l Merchandise Stores-45299	20 minutes	\$ 22,295,013	\$162.91	136,855	16,957	8
Miscellaneous Store Retailers-452	10 minutes	\$ 9,815,851	\$199.74	49,143	1,600	31
Special Foodservices 7223	30 minutes	\$ 10,748,280	\$188.05	57,157	2,000	29
Total Retail		\$ 161,070,976	\$167.24	963,102		170

Sources: Claritas, *Site Reports*, 2005; Urban Land Institute, *Dollars and Cents of Shopping Centers*, 2004; and FXM Associates.

**Reference Section J:
Photo Review of CH-2
District**

PHOTO REVIEW OF CH-2 DISTRICT



Property: Movie Theater; North-central side of district, eastside of Rt 137.

Analysis: Building set well back behind parking lot. Parking orientation allows landscape islands to filter view of building. No sidewalk on highway, and no designated walkway into property.



Property: New rug store; North-central side of district, westside of Rt 137.

Analysis: Newest construction, shingle style with peaked roof, and pedestrian-scale site lighting. Sidewalk on highway but no designated walkway to building. Minimal and small plant landscaping.



Property: Medical offices in central section of district, westside of Rt 137.

Analysis: Older building, shingle-style with peaked roof, and oriented away from main road. With foundation plantings, the effect is to close itself off from the most public side.



Property: Fire Station #2 on east side of Rt 137 near intersection with Rt 39.

Analysis: Classic municipal styling that defines the north-east corner of the main intersection.



Property: Town land northeast side of intersection of Rts 137 and 39, with cell tower flagpole.

Analysis: Property is highly visible and is considered a 'gateway,' but has no formal landscaping, unlike opposite corners (below).



Property: Lumberyard northwest side of intersection of Rts 137 and 39

Analysis: Building is a warehouse for bulk sales and looks the part. Large grass strip with split rail fence landscaping on road frontage, with ladder sign at intersection. No landscaping in parking lot. No sidewalk on road.



Property: Lumberyard northwest side of intersection of Rts 137 and 39

Analysis: This photo shows landscape strip extending down Rt 137. This is a walkable strip, but is not fully accessible.



Property: Shopping center on southwest corner of intersection of Rts 137 and 39.

Analysis: Building is a bent 'L' strip center, with sloped roof and brick and glass facade, and with actual second floor for offices in center. Grade prevents easy walk into the property from the Rt 137 frontage.



Property: Freestanding retail buildings on southeast corner of intersection of Rts 137 and 39.

Analysis: Freestanding, shingle-style buildings framing a parking lot and strip center. Excellent landscaping for multiple functions of connecting walkway, stormwater management, and beautification. Parking available beside building and in adjacent parking lot (below).



Property: Stop & Shop parking lot with Stop & Shop strip center in rear.

Analysis: Property currently undergoing reconstruction and expansion. Parking lot is landscaped and oriented for walking in aisles for either side.



Property: U.S. Post Office on Rt 39

Analysis: Standard format federal building with high traffic potential and with an entrance on Rt 39, but secondary access to the private road is not connected. Site plan is auto-oriented without pedestrian connections.



Property: Rt. 39 looking along unused buffer to Stop & Shop development towards the main intersection.

Analysis: Heavily used for pedestrians going to and from neighborhoods to the east. Opportunity for better and safer pedestrian way.



Property: Landscape and sign on edge of new strip mall (below). Frontage on private road/driveway, with foreground on Rt. 137.

Analysis: Creates large setback from both roads with parking in between road and building. Green space not being used for handling drainage, but bermed for visual buffer to parking.



Property: New strip mall in central area on east side of Rt 137.

Analysis: Bent building line angled away from main road frontage, with peaked and varied roof lines provides visual interest and does not overwhelm either street. However, there is no dedicated pedestrian way from street to building.



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