

DENSITY through DESIGN

Design Recommendations

Sudbury & Medway



Volume I consists of two separate design and
regulatory recommendation reports for:

Sudbury, Massachusetts

Medway, Massachusetts



This project was a collaboration between students of regional planning, landscape architecture and architecture at the University of Massachusetts Amherst. It was directed by Professors Elisabeth Hamin and Dean Cardasis who were assisted by Michael DiPasquale of the CPTC and Nedim Kemer.



The project was funded by a grant from the 495/MetroWest Corridor Partnership.

SUDBURY DESIGN RECOMMENDATIONS / Executive Summary

The following report is the product of a studio project developed by the Department of Landscape Architecture and Regional Planning at the University of Massachusetts-Amherst, in conjunction with the 495/MetroWest Corridor Partnership and the Town of Sudbury, Massachusetts. Central to our assignment was to develop an innovative design and regulatory solution for the Melone property in Sudbury Massachusetts. Because the Melone Property is a gravel pit expected to be totally excavated within two years, Sudbury has selected it as a prime location for future development. The development of this site served as a vehicle to address the core issues of the study, which are: increasing residential density, providing workforce housing options, and encouraging environmentally sustainable development.

We found Sudbury to be a community well aware of the need for lower cost workforce housing, and open to ideas on how to manage it. Sudbury is predominately made up of single-family homes, and the average home price at \$681,000 is well out of range to even someone earning the local median household income of \$130,000. Development of the Melone Site provides the town with the opportunity to address the issues of density, workforce housing and sustainability.

The findings in this report represent research including: an extensive site analysis of the physical and working conditions of the parcel; site visits to photograph, sketch, study and assess the site; conceptual design work to model existing conditions and preliminary concepts; a market analysis to study the existing economic, housing and school costs of Sudbury; a regulatory analysis to examine existing Bylaws, Subdivision Regulations and the Master Plan; interviews and meetings with local planning officials and stakeholders as well as experts from the Metropolitan Area Planning Council. Close contact was also kept with the town and planning officials from Sudbury.

The site analysis shows that the Melone property has amenities that make it a prime location for residential development. Once excavation is complete, the site will offer a “blank slate” for development. Abutting wetlands and conservation area are some of the natural features the area has to offer and trailheads to these areas lead right up to the site. The unique slopes of the Melone site will offer protection from cold northwest winter winds, and offer maximum solar orientation and spectacular views. Our market analysis suggests that a project with lower-cost but well-designed homes could be highly successful in the marketplace.

The regulatory recommendations made by this study strive to help Sudbury's housing goals align with the vision documented in their Master Plan (2001), which encourages a greater diversity of housing opportunities in the town. Our report recommends the following:

- “Sustainability” Overlay Zone
 - A new overlay zone to promote smaller, more ecologically efficient houses to reduce the financial burden of rents and mortgages.
- Inclusionary Zoning
 - A broader approach to inclusionary zoning, creating a provision for workforce housing rather than only statutorily-affordable housing.
- Amendments to the Cluster Development Bylaw
 - The integration of attached housing to encourage a diverse housing stock and provide for different household sizes and as well as household incomes.
- Accessory Apartment Dwelling Units.
 - Amending the current bylaws and creating incentive programs to stimulate the development of Accessory Dwelling Units, and maximize their potential as an option for workforce housing.

While these recommendations are designed for Sudbury we believe that they will be applicable to other communities within the I-495 corridor.

Two different design schemes for the Melone property have been created. Both design concepts maximize open space and increase density through sustainable measures. The Drumlin Scheme remains true to the historic architectural of Sudbury, arranging the architecture and vegetation to form a connection of large, open spaces and smaller community spaces. The Orchard Scheme brings more contemporary feel to the site. A grid arranges the architecture, and a path system provides capillary movement to large, open terraces, while affordability is enhanced by using modular dwellings.



Figure A: *Architectural concept*



Figure B: *Typical neighborhood clusters*

Through our recommendations and research, our team aspires to increase the diversity and density of the housing stock in the town of Sudbury through sustainable design and the preservation of community character. By using the Melone property as a pilot project for what density can look like in the MetroWest region, we seek to encourage other communities within the corridor to undertake similar projects.

MEDWAY DESIGN RECOMMENDATIONS / Executive Summary

Medway, Massachusetts, is one of dozens of municipalities in I-495/MetroWest corridor experiencing a shortage of low- to moderately-priced homes. This lack of “workforce housing” poses financial hardships for residents and discourages companies from locating in the region. As a result, communities in the region have witnessed an exodus of young professionals and families during the last decade. Without new solutions to this problem, Massachusetts’ economy and quality of life are at risk.

This report offers an innovative design for a workforce housing development at a 100-acre site in Medway, supported by market analysis, regulatory recommendations and implementation strategies. It has been generated during a graduate level interdisciplinary studio at the University of Massachusetts at Amherst involving students and faculty in regional planning, landscape architecture and architecture. The work was completed as part of a unique collaboration with the Arc of Innovation/495 MetroWest Partnership, which represents the interests of Medway and 31 other municipalities in the region. While the site design and recommendations offered are specific to Medway’s Oak Grove Bottle Cap Lots site, the lessons are of value to many communities in the region.

The Problem***Homes are Unaffordable and Don’t Meet the Needs of the New Century***

Massachusetts housing costs are very high, forcing many residents to move out of state; between 2000 and 2005, the population of 25- to 34-year olds in the Commonwealth declined by 82,572 (U.S. Census). Retention of this group is crucial for high tech and corporate employers to remain competitive. In Medway, the average home price has risen from \$166,500 in the 1990s to \$430,000 in 2005. Medway is 189 units short of meeting the 10% affordable goal set by Massachusetts General Laws Chapter 40B (U.S. Census 2000). Those earning above the maximum to qualify for affordable housing also face housing challenges. “Work force housing” buyers, such as teachers, nurses and fire fighters can only afford houses priced at approximately \$170,000 (Bureau of Labor Statistics, Warren Group, & Ginnie Mae Foundation).

Along with lower prices, different housing styles will be needed by the future residents of Medway. Currently, 81% of units in Medway are single family detached (U.S. Census 2000). Medway’s 55-plus population is expected to grow by about 2,000 people by 2030 (MAPC 2004). Married couples with children are no longer the majority household in the U.S. Today, 76% of all households are single

parents, and singles or couples without children (U.S. Census 2000). Taken together, these trends demonstrate a strong need for smaller, more affordable homes.

Lack of Tax Base Diversity

In Medway, homeowners bear a much larger share of the municipal budget than the average town (Town of Medway, Assessors Database; Municipal Finance Task Force 2005). This is a concern because typically every residential tax dollar received requires that a town pay out \$1.19 worth of services-- whereas for every commercial and industrial tax dollar received, the town provides only \$.29 worth of services (American Farmland Trust 2000).

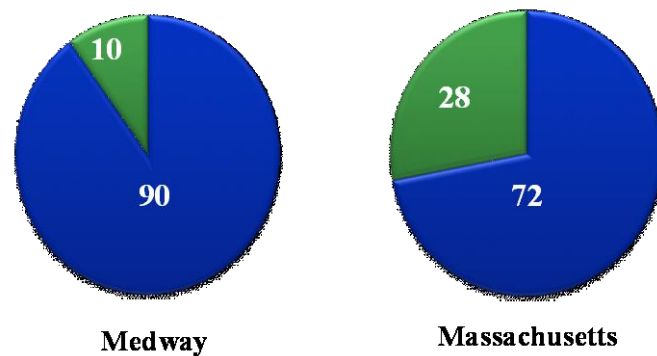


Figure C: Residential (blue) versus commercial (green) share of municipal budget

Source: Town of Medway, Assessors Database, Municipal Finance Task Force 2005

Outdated Zoning

Mandatory large-lot (one house per acre and higher) zoning poses a significant barrier to the creation of affordable housing. Land costs are high and costs are passed on to homebuyers. Mixed-use zoning can lessen auto dependence, use existing infrastructure, create a lively community and widen retail customer bases, yet few municipalities in the 495 Corridor have zoning to allow this flexibility of uses.

Proposed Solutions

Workforce Housing with a Traditional Neighborhood Density

Oak Grove Village is a workforce housing proposal for the 100-acre Bottle Cap Lots site along Route 109 at Medway's western border. It includes 180 two- and three-story townhouses at 10 units/acre and 120 apartments at 15 units/acre. This density is similar to neighborhoods built immediately before and after World War II. The proposed homes are affordable and reasonably-priced market-rate units with attractive architecture that incorporates sustainable materials and features. Connectivity is provided with a proposed transit connection to commuter rail (at the Franklin MBTA station), walkable streets, sidewalks and hiking trails. Sustainability is enhanced by maximizing solar gain and low-impact on-site storm

water management. The proposal includes a high percentage of publicly accessible open space, provided through the preservation of existing woodland and the creation of parks and plazas.



Figure D: *Traditional neighborhood density in a wooded context in Medway*

Mixed-Use and Industrial Development

Adjacent to Oak Grove Village is approximately 200,000 square feet of proposed industrial space and 185,000 square feet of proposed commercial, retail and office space. The property tax revenue from this build out would help to reduce the tax burden on homeowners.

The design proposes enhancing Route 109 as the western gateway to Medway with attractive mixed-use office, commercial, retail and apartments. Because market fluctuation is difficult to predict, this approach provides flexibility that will be a future asset. Continuing the industrial portion of the site to the south is crucial for maintaining and enhancing the presence of Medway's largest employer, Cybex, an exercise equipment manufacturer. While the commercial/industrial markets have been challenging in recent years, market research shows improvement, with positive absorption, declining vacancies and growing asking rents for industrial, retail and office sites in 2007 in the Route 495 sub-region (Grub and Ellis).



Figure E: *Mixed uses: commercial below: residential above*

Regulatory Recommendations

Oak Grove Village could not be permitted under Medway's existing zoning regulations. Therefore, two regulatory options are offered: a Mixed Use Overlay and a Form-based Overlay. Both options:

- Facilitate the implementation of the recommended site design.
- Offer developer incentives, such as density bonuses and mixed-use tenant flexibility.
- Maximize the new sewer infrastructure to be built by the Town.

The proposal illustrates the potential of sites outside town centers to qualify as "Smart Growth Districts" under Massachusetts Chapter 40R program, which may include reimbursement for additional public school costs from new pupils.

Recommendations for Community Engagement and Implementation

A key challenge to implementing the proposal will be achieving a two-thirds rezoning vote at a Town Meeting. Therefore, our recommendations focus on raising community awareness of workforce housing needs, communicating the benefits of the plan and building coalitions. The Town can utilize Requests for Proposals (RFPs) as opportunities to set the agenda. Engagement at the regional and state levels includes promoting appropriate eligibility requirements and securing funding for 40R and 40S, as well as promoting zoning reform legislation (Community Planning Act II.)

Conclusion

As land becomes more scarce and expensive, developing at low densities will be increasingly impractical. Building at greater densities is one of the best strategies for reducing land costs and accommodating growing populations while reducing development pressure on natural areas.

This workforce housing proposal would allow Medway to better serve its current and future residents and prepare for demographic changes. This report provides research and analysis that show how new development at traditional neighborhood densities can be marketable, politically feasible, and environmentally sustainable.

ACKNOWLEDGEMENTS

This studio report was produced through an extraordinary collaboration between the 495/MetroWest Corridor Partnership, the Town of Medway and the Department of Landscape Architecture and Regional Planning at the University of Massachusetts at Amherst. The students wish to thank the people who gave generously of their time and resources to ensure the studio's success. These include Andy Rodenhiser, Suzy Affleck-Childs, Glenn Trindade, Chan Rogers, Dennis Crowley and other officials from the Town of Medway; Ron Roux, Mark Kablack, Kathy Joubert, Senator Pamela Resor, David LaPoint and the other members of the Studio Review Committee of the 495/MetroWest Corridor Partnership; and Paul Matthews, Executive Director, and the entire staff of 495/MetroWest Corridor Partnership. We extend special thanks to Adam Ploetz, Manager of Sustainable Programs of Partnership, for his strategic guidance throughout the studio process.

Finally, we extend great thanks to our instructors, Elisabeth Hamin, Dean Cardasis and Michael DiPasquale, as well as our teaching assistant, Nedim Kemer and other LARP faculty who have offered comments and critique along the way, for giving us the opportunity to address and better understand workforce housing, an issue that affects the quality of life for people throughout Massachusetts.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
TABLE OF CONTENTS	ii
1. INTRODUCTION.....	1
1.1. Impetus for project.....	1
1.2. Context.....	2
1.3. Description of Medway.....	2
1.4. Site Orientation	5
2. METHODOLOGY	7
2.1. An Interdisciplinary Studio with an Emphasis on Community Engagement.....	7
2.2. The Iterative Process.....	7
2.3. Application of Research.....	7
2.4. Meetings and Presentations.....	8
3. MARKET ANALYSIS and RECOMMENDATIONS	10
3.1. Introduction.....	10
3.2. Housing Market Analysis	10
3.3. Demographic Change from 1990-2000.....	14
3.4 Analysis of Industrial, Commercial, and Retail Markets	18
3.5. Fiscal Impact Analysis	22
4: SITE DESIGN.....	27
4.1. Goals and Objectives	27
4.2. Program.....	27
4.3. Site Analysis	28
4.4. Early Concepts/Schematics.....	29
4.5. Final Concept.....	32
4.6. Preferred Design Alternative	33
4.7. Summary	42
5: REGULATORY ANALYSIS and RECOMMENDATIONS	44
5.1. Analysis of Existing Regulatory Conditions.....	44
5.2. Chapter 40R Smart Growth Districts	49
5.3. Regulatory Objectives.....	55

5.4. Regulatory Approaches Considered.....	56
5.5. Recommended Regulatory Approaches	58
5.6. Evaluation of Recommendations	63
6. COMMUNITY ENGAGEMENT and IMPLEMENTATION	65
6.1. Community Engagement to Date	65
6.2. Recommended Participatory Process Moving Forward.....	65
6.3. Engaging Stakeholders in the Promotion of Denser Residential Development.....	66
6.4. Recommended Outreach Products and Messages	70
6.5. Utilizing the Request for Proposal (RFP) as an Opportunity.....	72
6.6. A Vision for the Future	72
7. REFERENCES.....	75
Appendix A	81
Appendix B	83

1. INTRODUCTION

1.1. Impetus for project

Encouraging relatively dense suburban development in the 495 corridor is the focus of the ongoing study sponsored by the 495/MetroWest Corridor Partnership. The Partnership is a business-civic organization that “promotes economic vitality and sustains natural resources while enhancing the quality of life in the 495/MetroWest region.”

Central to the economic vitality and quality of life for the region known as the “Arc of Innovation” is affordable housing for a wide range of incomes and lifestyles.¹ For this reason, the Partnership recently sponsored the “Suburban Residential Development Density Project.” Communities interested in participating in this study submitted a letter of interest, which outlined the steps they have made to address the current housing crisis in their community and the reasons they would benefit from being included in this project. The town of Medway was chosen as an initial participant by the 495/MetroWest Corridor Partnership.

The Partnership contracted with the Department of Regional Planning and Landscape Architecture at the University of Massachusetts-Amherst to complete a studio project that would perform two primary responsibilities throughout the spring semester:

1. Research aspects of higher density developments.
2. Design an attractive higher density development for the towns of Medway and Sudbury.

During the first half of the semester, the following steps were completed for the research aspect of the project:

- ☐ Regulatory barriers that impede higher density housing from being constructed
- ☐ Driving factors behind community opposition to density
- ☐ Innovative design techniques that address the challenge of developing higher density housing that will be both successful in the marketplace and sustainable
- ☐ Precedents throughout the U.S. that show how municipalities have addressed public fears about density and how innovative zoning regulations allow for greater density

¹ The “Arc of Innovation” is defined by Route 9 and I-495 from Route 1 to Route 2. This region contains thirty-two communities and half a million residents. In addition, it hosts the headquarters of numerous national corporations and has an annual payroll of \$13.5 billion, second only to Boston in Massachusetts.

This report focuses on the design phase of the work that was completed during the second half of the Spring 2007 semester. The goal was to develop recommendations for the town of Medway and its chosen site based on the above research, which could then be applied to the rest of the 495 region. To meet this goal, an analysis of the site; market, demographic, and employment trends; laws and regulations; and implementation strategies and community process was conducted. This research and analysis provides the foundation for a recommended new development that will be marketable, politically feasible, and responsive to the site.

1.2. Context

Medway is faced with the problem of accommodating more affordable workforce housing in a market that does not support affordability. The average school teacher, nurse, and fireman can afford to spend just under \$200,000 on a home at their current salaries (Ginnie Mae Foundation, Bureau of Labor Statistics). With home sales in Medway averaging around \$430,000, this means housing remains unaffordable to a large segment of the population by more than \$200,000 (Warren Group). This problem will likely become even more accentuated since housing costs and Medway's population are both expected to increase in the future (State of the Nation's Housing 2006, MAPC 2004). The current growth pattern—low density, large-lot zoning—will not accommodate the increasing population. Instead inefficient land consumption continues to drive up housing costs and drives the workforce out of the MetroWest region. Medway's financial situation only adds to the affordability problem. Ninety percent of the town's tax base comes from residential property taxes. Medway town officials have stressed the importance of redistributing the tax base in order to take the burden off of the growing residential population. In order to maintain this workforce and remove the tax burden from the residents, more mixed-use, compact, and affordable development must be constructed.

1.3. Description of Medway

The town of Medway is located approximately twenty-two miles southwest of Boston between I-495 and MA-128 in the MetroWest region. It is bordered by Milford to the west, Holliston to the North, Millis to the east, and Norfolk, Franklin, and Bellingham to the south. According to the US Census, ninety-seven percent of the population identified as being white, the median household income was around \$75,000, ninety percent of residents drove to work, and forty-five percent of adults had at least a Bachelors Degree.

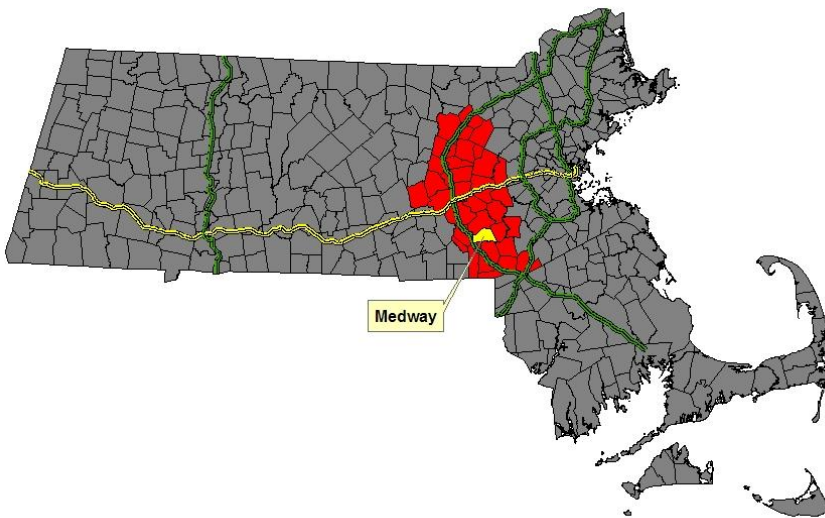


Figure 1: Medway locus map (Source:MassGIS)

Medway was incorporated in 1713. The earliest nodes of development occurred along the Charles River, which runs along the town's southern border. Development occurred first in the village of Medway, where the town hall is, and later spread to the village of West Medway, which currently contains the town's only historic district.

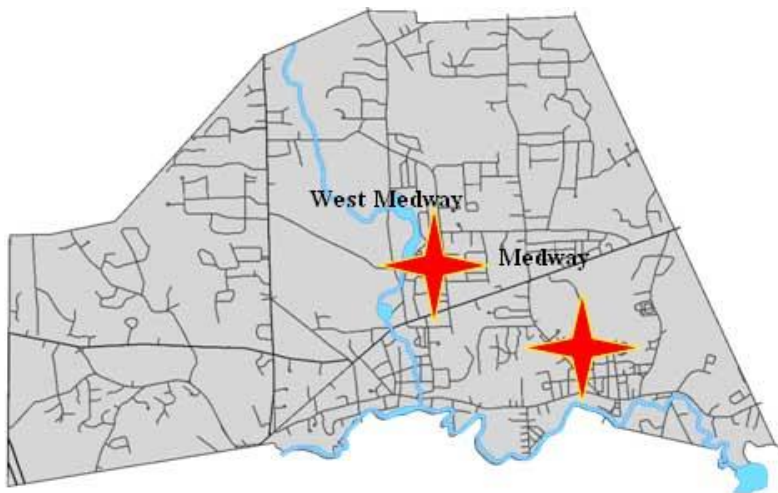


Figure 2. Town of Medway and its Two Village Centers
(Source:MassGIS)

Because of their position along the Charles River, the two village centers naturally developed into manufacturing centers. Factories were erected, including the characteristic New England textile, straw, and grist mills. Due to the nature of their products, most of the factories have since burned down. The first period of residential build-out took place during this period of industrial and agricultural growth in the mid-1800s—two and a half story farmhouses with attached barns serve as representative examples (Hoag 2007).

In the next century, a shift occurred from agricultural and industrial land usage toward primarily residential. Medway experienced a post-WWII housing boom, which transformed the landscape of Medway. Agrarian tracts of land were subdivided for the construction of single family detached homes. The most recent build-out took place in the 1990's. Residential homes grew in square footage and began to sit on larger lots with increased setbacks. Many new service buildings were also constructed such as a new police and fire station (Hoffman, 2007).

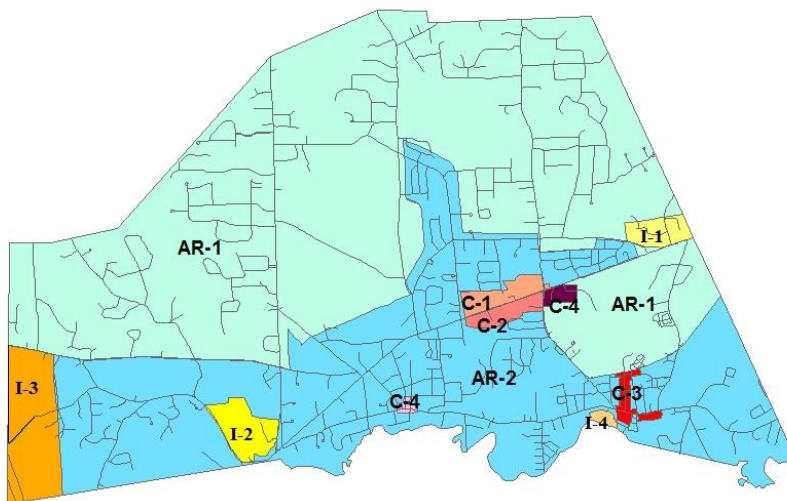


Figure 3. Medway Zoning Districts (Source:MassGIS)

Currently, ninety percent of Medway is zoned residential (MassGIS). The residential zones are indicated in blue (Figure 3). Agricultural and Residential I (light blue) is zoned for single family homes at one unit per acre. Agricultural and Residential II (darker blue) allows a slightly higher density at two units per acre or duplexes at two and a half units per acres. Only 10 percent of land in Medway is zoned for industrial and commercial use. The industrial zones are shown in yellow and orange. The Cybex plant, an exercise equipment manufacturer, is located within the largest industrial zone in Medway, Industrial

district III. They are very important to the area since seventy percent of their employees reside in Medway or surrounding towns (Wright). The last type of zoning in Medway is commercial, shown in red and pink (Medway Zoning Bylaw & Map).

This kind of large lot zoning is neither sustainable nor affordable. The landscape of Medway changed considerably from 1971 as agrarian tracts of land have been subdivided for the construction of single family detached homes that sit on large lots. By 1999, forty percent of the land in Medway was used for housing. Less than one percent of this of this number was comprised of multi family housing (MassGIS).

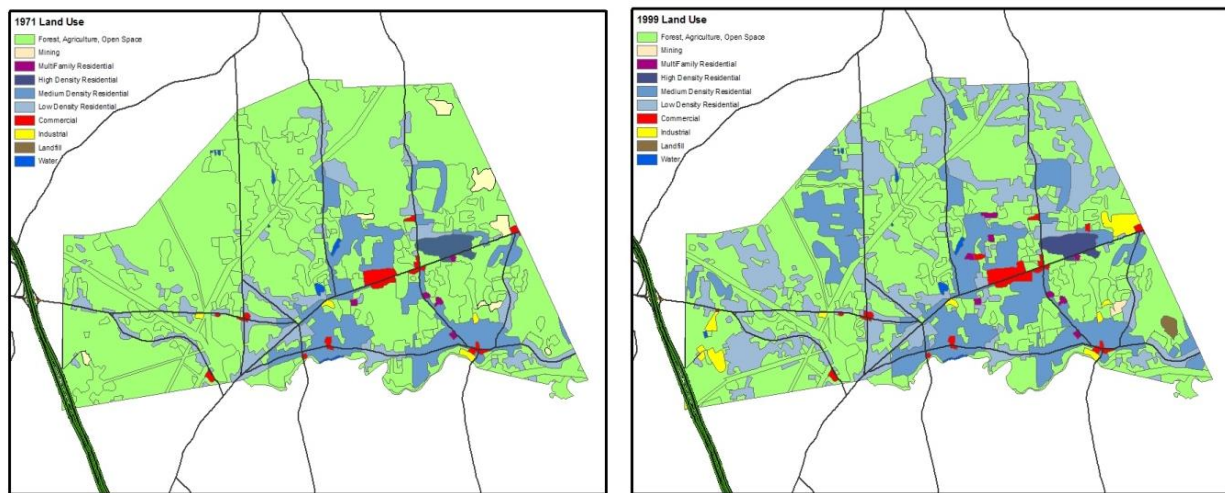


Figure 4. Medway Land Use Change, 1971-1999 (Source:MassGIS)

A build-out analysis done by Executive Office of Environmental Affairs in 2001 stated that 5,658 more people can be accommodated through current zoning. If Medway does not want to reach maximum build-out by the mid-21st century then the town needs to encourage denser patterns of development.

1.4. Site Orientation

The site chosen by town officials in conjunction with the Arc of Innovation has the opportunity to be a model for how density could be designed in an environmentally, economically and socially sustainable way. It is located at the Medway/Milford town line just east of Interstate 495. It is bordered by Route 109 to the North, West St. to the east and Alder St. to the south. Trotter Drive runs north-south through the site, providing access to the Cybex facility and other industrially zoned land.

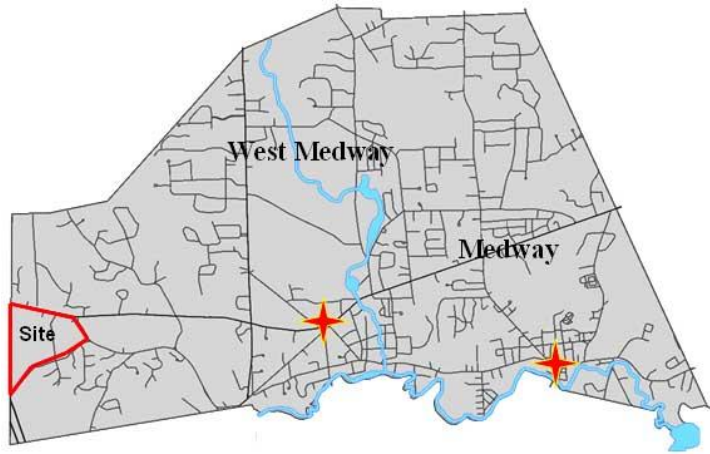


Figure 5. Site in relation to Medway village centers (Source: MassGIS)

Many of the parcels on the site are very small, in fact 242 parcels are under 1,000 square feet. The Clicquot Club, a soda company founded in nearby Millis in 1881, gave away these individual tracts to consumers with a winning soda bottle cap during a beverage contest in the 1920s. The “Bottle cap Lots” can be found on either side of Trotter Drive, mainly aligning with Route 109 (Milford Street) to the north and West Street to the east (Town of Medway). In order to further describe and explain the site, Chapter 4 will provide an in-depth site analysis. Before the site analysis, it is first important to show the methodology and market research (Chapter 2 and Chapter 3) used to establish the concepts for the site design.



Figure 6: Remaining Bottle Cap Lots, Medway (Source: MassGIS, Assessors Parcels 2006); Clicquot Club soda can, c. 1920; (Source: Clicquot Club Café).

2. METHODOLOGY

2.1. An Interdisciplinary Studio with an Emphasis on Community Engagement

Students have had a unique and valuable learning opportunity in this studio because of its interdisciplinary nature and emphasis on community engagement. The most successful development projects involve professionals from several disciplines, including construction, planning, landscape architecture, architecture, engineering and real estate. Professionals need to work together with a mutual understanding of what others are doing and what they strive to gain from the project. The joint nature of this studio has allowed students to experience some of the ways that planners and landscape architects can work together with other collaborators. For example, the site design team was able to respond to the research that the marketing team had conducted and modify the program for the site. Likewise, recommendations for zoning regulations were informed by the site design. Lastly, throughout the entire studio, input from stakeholders in Medway and at the Partnership has largely directed the process to date.

2.2. The Iterative Process

The following steps were taken in an iterative fashion, building from each successive stage:

- ☐ Application of research from the first half of the studio
- ☐ Stakeholder input via interviews and feedback from presentations
- ☐ Data collection, analysis and documentation
 - Market trends
 - Demographics
 - Existing site conditions
 - Existing regulations
- ☐ Development of goals, objectives and site program
- ☐ Fiscal impact analysis
- ☐ Review of best regulatory practices
- ☐ Site design development
- ☐ Formulation of recommendations
 - Site design
 - Regulatory changes
 - Implementation

2.3. Application of Research

The components of this report, in addition to being interrelated throughout their development, also reflect the application of the research projects from the first half of the semester. For instance, the research

report that presented outstanding examples of higher density neighborhoods such as Radburn, New Jersey helped shape design concepts for the Medway site. The research report on regulatory barriers also affected the development of this plan by determining which regulations would have to be overcome if the design were ever to be implemented.

The research report on community opposition to density provided design strategies to help mitigate concerns related to higher density that have been incorporated in this proposal. For example, it has been shown that access to alternative transit, sidewalks, and mixed-uses are important to the success of denser neighborhoods. A 1999 study in the Journal of Planning Literature entitled “Disentangling the Concept of Density” by Arza Churchman, showed that certain environmental cues serve to reduce perceived density. The cues that were selected for application on this site are the following:

- ☐ Visual and functional accessibility from dwelling units to open spaces;
- ☐ Division of units into small clusters;
- ☐ Fewer dwelling units that use the same building entrance;
- ☐ Retention of on-site vegetation as visual and auditory buffers;
- ☐ Provision of convenient parking; and
- ☐ Varying the shape and proportions of lots.

Another study noted that concerns about safety could be addressed through the careful placement of landscaping and the provision of adequate lighting.

The research report on precedents for achieving greater residential density influenced the regulatory recommendations by detailing the design elements of successful neighborhoods in various regions of the country. This report has been instrumental in the development of the community process recommendations because it discussed how the collaboration of many stakeholders has shaped projects that were satisfying to the greatest number of people. It also detailed specific products that are helpful during the implementation phase of projects.

2.4. Meetings and Presentations

Studio members received and responded to frequent guidance and feedback from Medway community members and the Partnership’s Studio Review Committee members. Table 1 below is a listing of meetings and presentations.

Stakeholder(s)	Date	Topic	Location
----------------	------	-------	----------

Medway Design Recommendations

Arc of Innovation, Adam Ploetz	29-Jan-07	Regional workforce housing project initiation	UMass Amherst
Medway municipal officials	7-Feb-07	Municipal planning challenges and priorities, site orientation	Medway Town Hall, BottLe Cap Lots site
Medway municipal officials	14-Feb-07	Site investigation, municipal priorities	Medway Town Hall, Bottle Cap Lots site
UMass Landscape Architecture and Regional Planning Faculty	14-Mar-07	Presentation of research findings and critique	UMass Amherst
Arc of Innovation Design Review Committee (including Medway officials)	16-Mar-07	Presentation of research findings with committee feedback	Arc of Innovation offices, Westborough
Arc of Innovation Design Review Committee (including Medway officials)	4-Apr-07	Presentation of initial site concept schematics with feedback	Arc of Innovation offices, Westborough
Medway municipal officials, developers, planning board members	11-Apr-07	Presentation of revised site concept schematics with feedback	Medway Town Hall
Arc of Innovation, Adam Ploetz	30-Apr-07	Presentation of regulatory analysis, recommendations, marketing analysis	UMass Amherst
UMass Landscape Architecture and Regional Planning Faculty	9-May-07	Presentation of final design concepts, market and regulatory analysis with recommendations	UMass Amherst
Arc of Innovation Design Review Committee (including Medway officials)	11-May-07	Presentation of final design concepts, market and regulatory analysis with recommendations	Arc of Innovation offices, Westborough

Table 1: Meetings and Presentations

3. MARKET ANALYSIS and RECOMMENDATIONS

3.1. Introduction

There are two general purposes of the market analysis: first, to identify future opportunities for growth on the Oak Grove Bottle Cap Lots site, and second, to provide valuable information to the municipal government for use during the process of presenting the site design to the public. Chapter 3 will identify future opportunities for growth on the site, and provide analysis details for the socioeconomic, real estate, and employment characteristics of Medway as well as the most current industrial, retail, and office market trends in the region. This chapter will also discuss costs associated with different housing scenarios and family types and the cost and benefit of various land use scenarios. The analysis will assist the municipality in determining the most realistic and feasible development opportunities that are possible on the site.

This chapter provides recommendations that inform the design of the site, help determine the allocation of building layout and mitigate concerns surrounding development, and finally, provides key information to the regulatory team as they determine zoning changes to accommodate sector-specific growth.

3.2. Housing Market Analysis

Currently the nation is experiencing a slow down in the housing market as new housing sales are dropping significantly throughout the hottest markets in the United States. However, some leading experts believe that the slow down will be short-lived. In 2006, the U.S. economy grew at a slower pace than expected, largely as a result of the sluggish real estate market. According to a study published in 2006 by the Joint Center for Housing Studies, titled *The State of the Nation's Housing*, builders throughout the country have responded to softening markets by scaling back production. For instance, Massachusetts experienced a 5 to 9 percent decrease in single-family home production from 2004-2005 (p. 6). The slow down is being mitigated by the stable growth of jobs and households, strong home appreciation and recovering rental markets.

High Cost of Living in Massachusetts

A recent report prepared by the Center for Urban and Regional Policy at Northeastern University stated that Boston ranks highest in cost of living in the country. A regression analysis was used in the report to show that housing cost is the most significant factor driving the high out-migration and high unemployment levels (Bluestone, 2006). Local zoning regulations enforcing large lot development, impact fees and long permitting processes, and restrictions on land available for residential use, have driven up prices for homes and decreased the incentive for creating affordable housing in the State of Massachusetts (Goodman and Palma, 2004).

It is currently a statewide priority to encourage development of moderately and affordably priced housing in nearly every town in the state. The lack of housing supply in the Commonwealth is another major factor in the high prices of homes. Between 1990 and the year 2000, the number of new households increased by 8.7 percent, while the number of new housing units increased by only 6 percent (Goodman and Palma, 2004). An additional 70,000 homes would have to have been produced in the State of Massachusetts to keep up with demand.

Regional Land Use 1998-2002

Between 1998 and 2002, homes in much of the state were built on average lot sizes of one to two acres. However, the median lot size for multi-family construction was less than .25 acres. This implies that the predominance of single-family homes has driven the low-density development in the town (MIT CRE, 2006).

Medway lies outside of Route 128, a region that utilizes more land per dwelling unit than inside Rt. 128. Additionally, compared to the significantly higher populated metropolitan Boston area, communities outside of Route 128 use much more land per person.

The Medway Housing Market

The Town of Medway is predominantly a single-family home market, with very few apartments and condos. Ninety-three percent of the land in the Medway is zoned for single-family residential and agricultural use (EOEA Buildout Analysis, 2007). In 2006, 83.1 percent of Medway's housing stock was single-family. Of the 4,329 housing units in Medway, 67 are vacant, which represents a 1.6 percent total vacancy rate. Typically, when the vacancy rate is lower than 5 percent the supply is not keeping up with demand and/or the consumer is faced with limited options, and increasing rates (MSL Online, 2006).

Home Sales and Prices

After a construction surge in the 1980s, the 1990s saw an increase in sales through the early part of the 21st Century. From 2002 to present, the sales of single-family units have plummeted, reflecting an end to the housing boom in Medway. These trends also correlate with the slowdown to the metropolitan Boston housing market (Heudorfer and Bluestone, 2006). However, the sales of condos have remained mostly stable since the mid 1990s (Figure 6).

Density through Design: Volume I

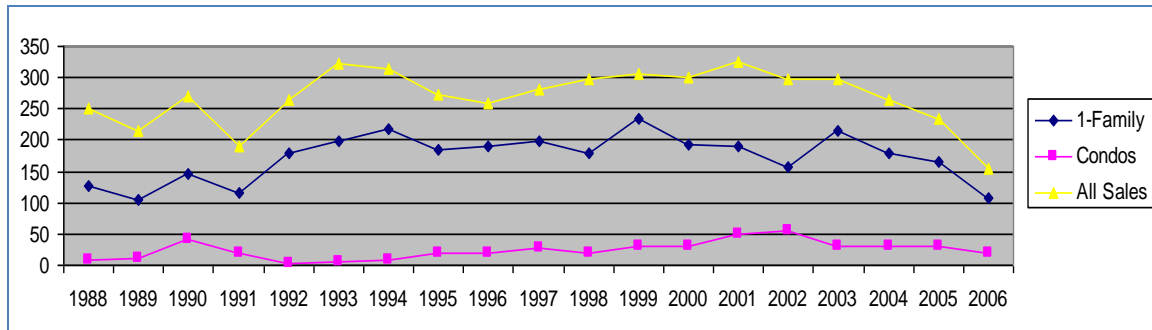


Figure 6. Single Family, Condo and All Sales 1988-2006 (Source: Warren Group, 2007)

Between 1980 and 2004, the overwhelming majority of building permits issued in Medway was for single-family homes (US Census Building Permits Survey). Figure 7 contains the building permits issued from 1990 to 2005, and shows that building permits have declined steeply from 103 in 2001 to 31 in 2005.

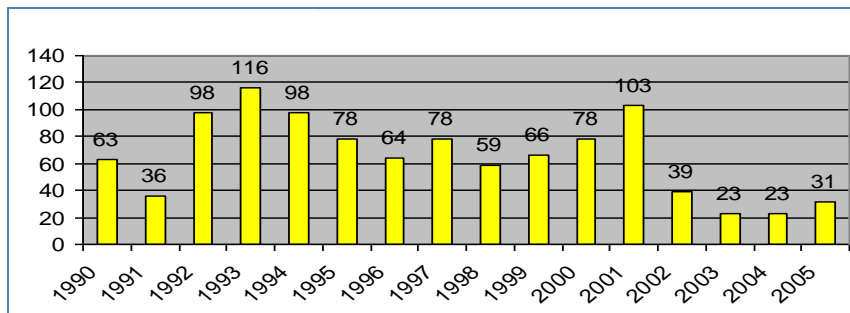


Figure 7: Building Permits Issued Per Year (Source: The Town of Medway, 2007)

The median price for both single-family homes and condominiums has been increasing since the early 1990s. The rise in the sale price of condominiums is particularly alarming since they are a more affordable housing alternative to single-family homes (Heudorfer and Bluestone, 2006) (Figure 8).

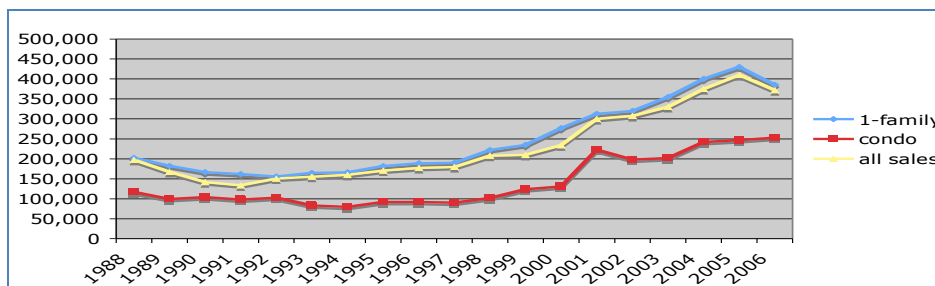


Figure 8: Residential Sales Prices (Source: Warren Group, 2007)

The national housing trends of increasing sale prices, decreasing sales and scaling back of inventory are reflected in the Town of Medway (State of the Nation's Housing, 2006). This slowdown is being somewhat mitigated by the increasing number of jobs and low unemployment rate in the town.

Workforce Housing

Similar to most of Massachusetts, the housing market in Medway is not favorable to first-time homebuyers or lower to medium-income professionals. In Medway, the estimated median household income in 2005 was \$87,957, while the median price of a single-family home from 2004 to 2005 increased by 7.5 percent, or from \$399,950 to \$430,000. The median household price affordable to Medway residents in 2005 was \$399,804 (Heudorfer and Bluestone, 2006). Figure 9 depicts the gap between the salary of selected workforce professionals and the median sale price for homes in Medway.

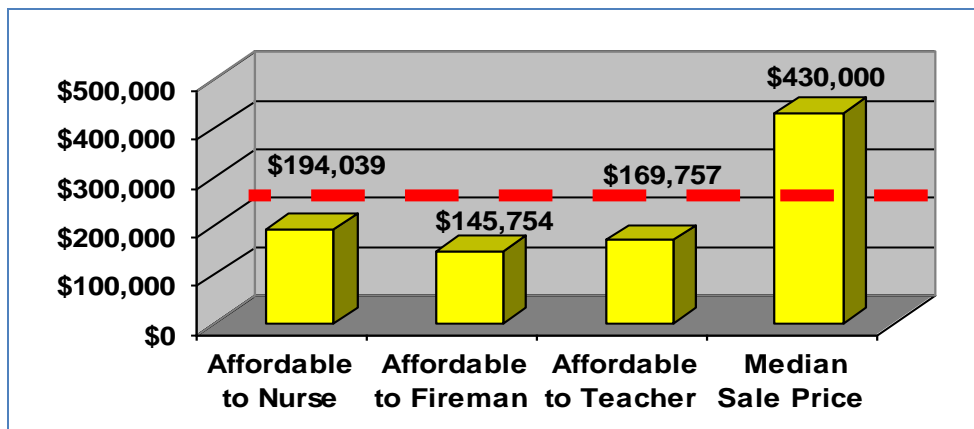


Figure 9: Medway Housing Affordability Gap (Sources: Bureau of Labor Statistics, Metropolitan Area Occupational Employment Wage Estimates, Framingham NECTA Division; Warren Group, "Town Stats," Median Sales Price per Calendar Year, Medway, MA; Ginnie Mae Foundation, "Homeownership and Guide Calculators")

A teacher on an average salary of about \$55,000 a year is able to afford a home that costs about \$170,000, assuming the teacher spends no more than 30 percent of their income on housing costs. The median home price is \$430,000 – creating a gap of about \$260,000 for people who are typically considered "workforce housing" buyers.

The Medway Renting Market

In the year 2000, the vacancy rate for Medway was 0 percent (US Census, 2000). In the same year, Medway's median rent of \$720 was below the median gross rent for Norfolk County at \$853. However, a web-based search for apartments reveals that there are not many apartments to choose from in Medway: seven websites revealed only thirteen total apartments.

	1 BR	2BR	3 BR	4BR
Internet Search	800	887	\$1,500*	\$2,000*
State-MA FY 2007 Fair Market Rent	1135	1419	1775	2084
FY 2007 HUD Fair Market Rent	1164	1366	1634	1795

*one apartment identified in this category

Table 2: *Estimated Median Rental Rates and Fair Market Rates (Source: Summary Profile 3, Census 2000)*

As shown in Table 2, Medway's rental housing is relatively affordable, with the exception of 4-bedroom apartments, when compared to the HUD fair market rent. However, the lack of available apartments restricts the amount of people that can take advantage of these prices.

The Medway Housing Authority (MHA, 2007) stated that they had 194 units available, of which 94 were under the stated subsidized housing unit list and designated for the elderly only. The remaining 100 were on the federal subsidized housing units list, of which 70 were designated for the elderly and 30 for families. Currently, the MHA for families is closed and the expected waiting time is 2 years. For the elderly, the waiting time can take only a few months. The MHA stated that there were not many rental units available in the Medway market. These data support the need for affordable and workforce housing in Medway (MHA, 2007).

Summary of Housing Market Analysis

The state trends of increasing land consumption and house production in light of smaller population growth is also reflected in Medway. Low density development, combined with an increasing lack of housing supply are two key factors that cause the high prices. The lower production of homes, without any major effort to create workforce and affordable housing will ensure that housing prices continue to rise and the affordable housing supply will diminish. Lack of available land through zoning restrictions is among the main regulatory causes for the high house prices. The lack of single-family, multi-family, and rental housing supply also adds to the cost burden. The impact of increasing home prices and lack of housing supply in Medway is similar to the state trends of losing domestic residents to states with a lower cost of living.

3.3. Demographic Change from 1990-2000

The future demographic changes in the region will increase pressure in Medway to create workforce housing. Between 1990 and 2000 the population of Medway grew from 9,931 to 12,448: a change of 25.3 percent. Despite statewide trends of net population loss, the population of Medway is projected to

increase over the next few decades (MAPC, 2006). The age cohort pyramid found in the appendix reflects an aging population (Appendix B, Figure 31). The largest cohorts are between the ages of 35-39 and 40-44. The smallest age cohort under 65 is the 20-29 year-olds (US Census 1990, 2000). The small size of this age group may largely be attributable to the lack of affordable housing in the town, region, or state. Statewide during the decade of the nineties, the size of the cohort of 20-34 year-olds declined by 16 percent (CUPR, 2006). In order to retain this age group, Medway and the region should seriously consider the development of workforce housing.

Regional Population Growth

The region's population is expected to increase by 465,000 people by 2030. The developing suburbs along I-495 are expected to have the greatest percentage gains in population growth because of their abundant unprotected open space. Growth in the region will come mainly from baby boomers and international immigration as net out-migration continues to drain the state's population (*Our Changing Population*, MAPC, 2006, *State of the Nation's Housing*, 2006). Figure 10 highlights the expected population decline of persons between the ages of 30-45.

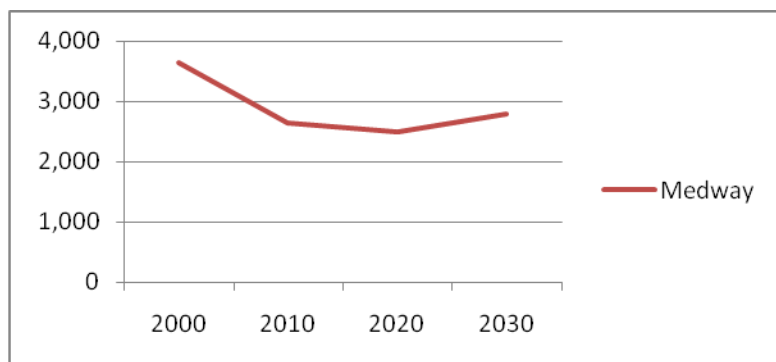


Figure 10: *Population Decline (30-45 years old)*

(Source: MAPC, 2004)

Currently, the buildout analysis states that 5,658 more people can be accommodated (EOEA Buildout Analysis, 2007). With either of these two scenarios, the town of Medway should build more densely to accommodate the growth trends to prevent from reaching buildout by the middle of the 21st century (MAPC, 2006).

Aging Population

The 55+ population will increase by 1,226 people by 2030. This represents 73% of the Medway population growth projected for the next 20+ years. If the high cost of housing causes seniors to retire

elsewhere, much of the population growth in Medway and the region will evaporate (MAPC, 2006). Figure 11 highlights the increase of people aged 55 and over.

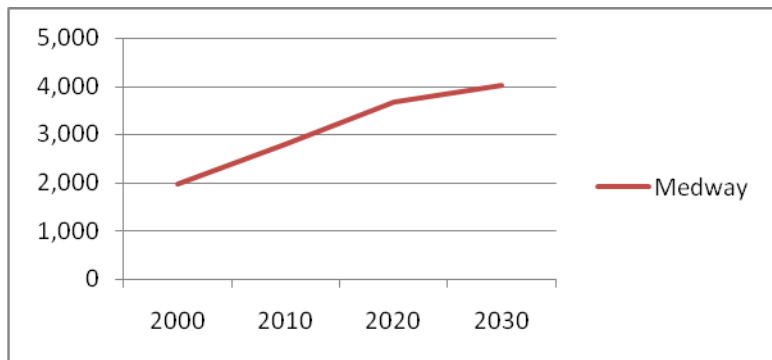


Figure 11: Population Increase (55+) (Source: MAPC, 2004)

School Age Population

The region is also expected to lose 6 percent of the school age population. In 2008, Medway is expected to lose 23 students from its public schools, about 1 percent of total enrollment. The decreasing student enrollment, in addition to various family types that exist in Medway, imply that the town will not incur significant school costs from adding workforce housing (Medway Public Schools, 2007). By the year 2030, the MAPC predicts that there will be a decrease of 36 persons ranging in ages from 5-19 years old in Medway (MAPC, 2004).

Economic Benefit by Household Type

Nationally, the number of married couples with children is expected to grow modestly, but they will continue to contribute the greatest amount of total consumer spending to the economy. For every dollar married couple households with children spend, childless couples spend only 83 cents, single parents 53 cents, and single persons 48 cents (*The State of the Nation Housing*, 2006). Therefore, the school cost associated with families with children is somewhat offset by the higher consumer spending compared to other family types. Figure 12 details the economic impact that various household types have on consumer spending.

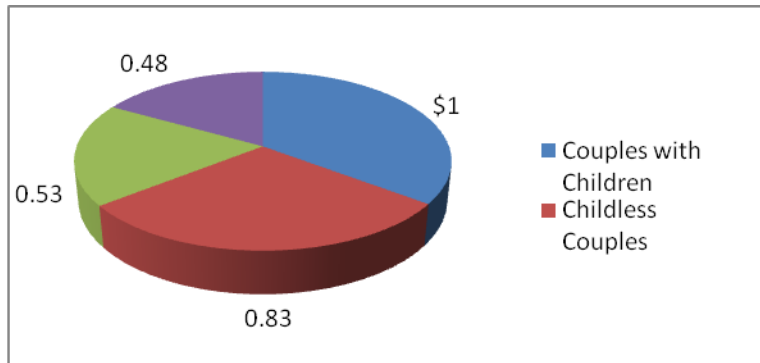
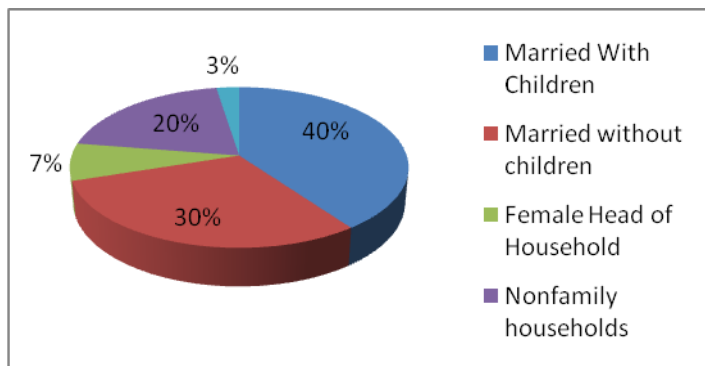


Figure 12: Household expenditures per dollar by types of household

(Source: State of the Nation's Housing, 2006)

Medway has a mix of family and household types. In 2006, 40 percent of families were married with children, 30 percent were married without children, and 7.5 percent had a female head of household only (MSL Online, 2006). These numbers reflect a 1.5 percent decrease in married couples with children and a 3.1 percent increase in female head of households (Census, 2000). The percentage of nonfamily households has remained the same at 20 percent. This small change in Medway signifies that the population will likely maintain similar households in the future. Figure 13 highlights the percentage of the various family types in Medway in 2006.



Source: MSL Online, 2006

Figure 13: Medway family types

International Migration and Diversity

International migration and growing diversity will not impact the Town of Medway as much as the rest of the region because of the town's lack of affordable housing. In 2000, only 4.7 percent of Medway's population was composed of foreign-born individuals (Census, 2000). Unlike Medway, by 2030, 31 percent of the MAPC region is expected to be Black, Hispanic, Asian or another non-white race (MAPC, 2005). Nonetheless, if recent growth patterns continue most non-white populations will be confined to a

dozen urban centers. It is important that suburban towns like Medway prepare for additional incoming immigrants and domestic people of color by providing workforce housing. This will prevent segregation, and will balance the employment base in the region given the current trends of out migration throughout the region. Additionally, some immigrants have bachelor degrees and others do not, attracting employers from diverse industries will ensure that Medway takes advantage of the different skill levels of incoming groups.

The Bottom Line

Medway will require redevelopment of commercial and industrial properties, and increased emphasis on apartment buildings and townhouses to accommodate the expected growth in the aging, minority, and workforce population (MAPC, 2006, p. 1). Much of the region's population growth will evaporate if the aging population and international migrants decide to reside elsewhere. Furthermore, many of Medway's residents are married without children or live in a non-family household. The creation of workforce housing will allow Medway to better service its residents and prepare for the predicted demographic changes.

Constructing denser developments of multi-family homes will be crucial in maintaining the rural character of the community. This could prevent the loss of open space given that the MAPC predicts that the region could lose 130,000 acres of open space to residential development (MAPC, 2006, p. 1). Furthermore, growth will place pressure on local roads and watersheds that are beyond the reach of regional water and transit systems. By building more multi-family homes, the town will be able to channel growth, minimize the impact on roads, and take advantage of the savings associated with more efficient use of infrastructure (Diamond, 1995; Burchell, et. al, 2005).

3.4 Analysis of Industrial, Commercial, and Retail Markets

Boston Industrial Market

Based on a fourth quarter, 2006 industrial market trends report of the Boston area by Grubb & Ellis Company, the Boston industrial market absorbed 900,000 square feet of space during this period. This growth was the largest single gain since the second quarter of 2005. According to the report, the largest gains are mainly attributable to new lease activity in the South and North submarkets. Vacancy stands at 13.4 percent and average asking rents have risen to \$7.96 per square foot, an increase of \$0.12 since the third quarter. The manufacturing sector improved during 2006 because of lower energy prices, and this improvement rubbed off positively on the industrial real estate market.

In the South, a spike in warehouse and distribution demand helped the submarket achieve absorption rate growth of nearly 500,000 sq. feet. On the other hand, the West submarket (of which Medway is included) posted a fourth consecutive quarterly drop in tenancy. The West has seen vacancy rise and asking rents drop in 2006. Vacancy in the West submarket as of the fourth quarter of 2006 was 13.5 percent. Asking rents in the West submarket were \$8.34 per square foot.

Industrial growth remains slow and available space will need to be filled before vacancy dips below 10 percent, thus signifying a balanced market. Market vacancy is declining and Grubb & Ellis suggest a trend toward positive absorption throughout 2007. There has been an increase in employment in the packaging and food processing sectors, giving a rise to manufacturing jobs.

Grubb & Ellis report that new industrial construction will not significantly impact the leasing market in 2007. Because construction costs are high, developers are hesitant to develop new projects in the outer suburbs. In oversupplied industrial areas many new retail and multi-use facilities are being converted from industrial properties. Nevertheless, Grubb & Ellis state that new development of industrial properties could be successful provided the amenities satisfy demand and the location is convenient.

Office Market

According to Grubb & Ellis, the Interstate 495 submarkets dropped their vacancy 2.2 percentage points down to 24.2 percentage points. The average Class A asking rent in Interstate 495 broke the \$20.00 mark for the first time since 2003, rising \$0.40 from the fourth quarter of 2006 up to \$20.19 per square foot (Grubb & Ellis, 2007). The Greater Boston office market expanded by half of a million square feet during the first quarter of 2007, while vacancy dropped to 13.2 percent. The first quarter 2007 reports suggest that the office market in the Boston region and the West region (including Medway) is improving.

Retail Market

According to Grubb & Ellis, despite increasing gasoline prices, consumers continue to provide the necessary stimulus for retail expansion nationally. Upscale and discount retailers are outpacing middle market retailers. Sale prices for prime pad sites increased by 9 percent during 2006. Grubb & Ellis predict that retail should continue to perform well during 2007.

Competing Communities

Of the five communities that border Medway, Milford poses the greatest commercial and industrial competition given their proximity to Medway and distinguished business history. Today Milford is known as the industrial center of the area, with a diverse set of retail, wholesale businesses, manufacturing firms and numerous services (*Community Profile*, Town of Milford, 2005). In addition,

Milford has a strip mall, a Target, Wal-Mart, a few banks, pharmacy stores, grocery stores, and convenience stores. There are also 6 hotels in Milford: The Radisson, The Marriot Courtyard, The Days Inn, the Taje Inn, Holiday Inn Express, and the Fairfield Inns & Suites, for a total of 673 rooms and suites.

The rest of the bordering communities (Holliston, Bellingham, Franklyn, Millis) contain additional banks, department stores, and pharmacies. The Wrentham Village outlet, a major outlet center is located in nearby Wrentham. Currently, some developers are attempting to build a lifestyle center in Bellingham and Mansfield (author's interview with Harmon Lewis, commercial realtor).

Since the site lies half a mile from Exit 19 of I-495, the process of determining suitable land uses for the site necessitated an understanding of the zoning and land uses of Holliston, Hopkinton, Milford, Bellingham, and Franklin. These communities also have land zoned near the Interstate for residential, commercial, and industrial purposes and would be competing for development interest. A comparison between lands zoned for industrial and commercial use and land actually in use within 1 mile buffers of Exits 16-21 of I-495 shows that most of the land zoned for commercial and industrial use along this stretch of the Interstate is still not built out (Figure 14). This means that these districts potentially have the capacity to accommodate more growth.

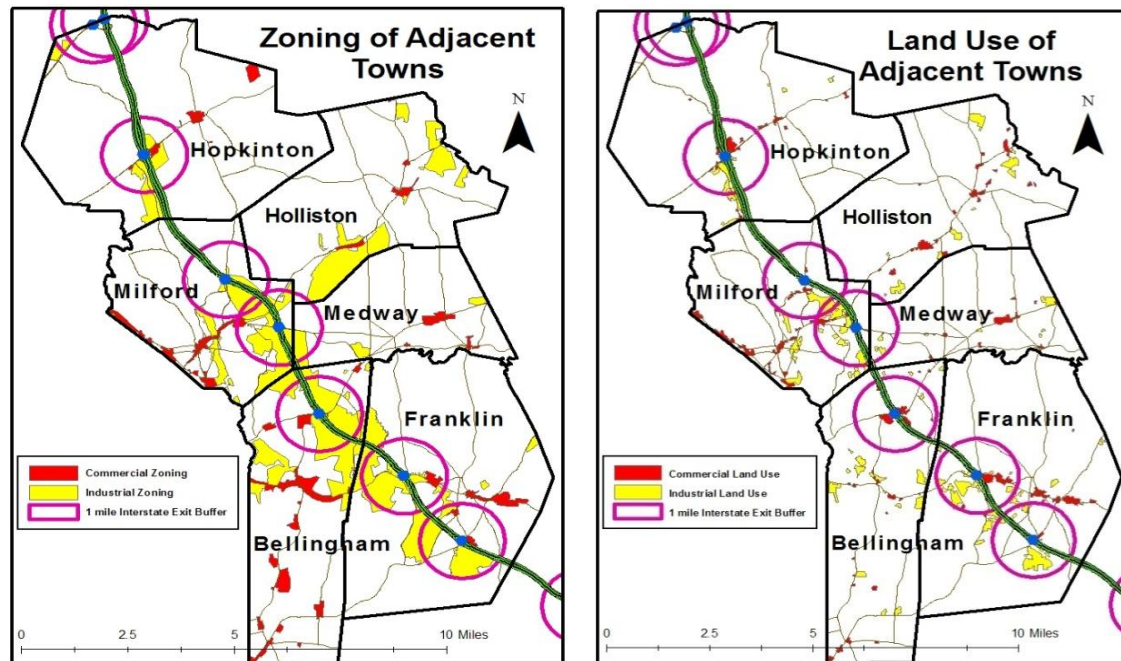


Figure 14: Zoning and land use within 1 mile of I-495 Exits 16 through 22 Source: Mass GIS

None of the towns along this stretch of 495 currently have a mixed-use zoning base district within this buffer or even within two miles of an Interstate exit (Mass GIS, Town of Bellingham Zoning By-law, Town of Franklin Zoning By-law, Town of Holliston Zoning By-law, Town of Hopkinton Zoning By-law, and Town of Milford Zoning By-law). For this reason, Medway could capitalize on the site's proximity to the Interstate exit and achieve greater market interest for its comparatively small industrial zoned land if mixed-use flexibility were offered to developers.

Medway may best utilize a mix of commercial and industrial development on the Oak Grove Bottle Cap Lots site given the insufficient acreage for more competitive retail or industrial firms. The retail should be geared towards the future residents of the new development and the employees of nearby industrial companies. Suggested types of retail/commercial include dry cleaners, day care, gym, a convenience store and restaurants or small food shops and a hotel/conference center. Since there are several banks in within a few minutes from the site, an ATM may be installed in case residents need to collect money for purchases in businesses located on the site.

Employment Analysis

The Metropolitan Boston region is expected to add 240,000 jobs from 2000 – 2030. Medway is expected to contribute to the employment growth in this region by adding up to 1,000 workers by 2030. The service sectors will have the largest number of new jobs. Municipal level employment projections indicate that the largest job gains will be in the inner core of the region and along major highways in communities that are already major job centers. Anticipated job growth in some communities may not materialize if local water supplies are limited and other resources are not available. Figure 31 in the Appendix B highlights Metropolitan Boston's employment gains from 2000 to 2030.

Employment Characteristics

Employment grew steadily in Medway during the past 3 years, with growth concentrated in the services, retail trade, leisure and hospitality, and manufacturing sectors. The trends in employment from 2001 through 2006 are presented in Table 20 within Appendix B.

From 2001 to 2005 the employment in retail trade, leisure and hospitality increased at a rate of 71 percent and 31 percent respectively, while manufacturing decreased during the same period by 2 percent. Manufacturing decreased during the years 2001-2004, but increased in 2005 and is predicted to have increased in 2006. During the years of 2001-2005, all industrial wage and salary employment increased by an average of 4 percent each year. Total employment grew at the same average annual rate of 3 percent during the year of 2001-2005. The average increase in the employment rate in Medway is much

higher than Norfolk County and the Town of Milford, which are -0.7 percent and 1.3 percent, respectively.

Market Summary

Medway's increased job growth coupled with workforce housing will facilitate further commercial and industrial expansion by making Medway an affordable place to live for the emerging workforce as well as middle age workers. Since the MetroWest submarket is the weakest market in the region, a combination of commercial and industrial property will diversify the town's risk. Industrial parks are scarce in Medway, and the Medway site is very well situated close to Interstate 495 for industrial uses. A mixed-use site will also help reduce the tax burden on residents and bring the job-housing balance back to equilibrium.

3.5. Fiscal Impact Analysis

Taxes

Our research showed that the primary concern regarding dense residential density was the financial impact to schools and to town services brought on by an increased number of school-aged children. Municipal officials stated that they would like to redistribute the tax base to alleviate some of the burden from homeowners. Table 3 below details the amount of tax revenue to the town from various uses as well as the percentage of the total revenue. Residential property taxes far outnumber the commercial and industrial taxes raised by the town. The Town of Medway has a tax rate of \$13.32 per \$1,000 of assessed value for all property types.

Table 3: Fiscal year 2007 tax classification

Use	Amount \$= Assessed Value	Tax Levy	Percentage	Tax Rate
Residential	\$1,630,436,798	21,717,413	89.40%	13.32
Commercial	\$70,263,152	935,905	3.90%	13.32
Industrial	\$68,274,650	909,418	3.70%	13.32
Personal Property	\$54,190,080	721,812	3.00%	13.32
Total Assessed Value	\$1,823,164,260	24,284,548	100%	-

Source: Massachusetts Department of Revenue, Division of Local Services

The industrial and commercial property value in the site was calculated based on the average value per square foot of Lotus, a Chinese restaurant in the area and Cybex, and multiplying them based on the proposed design footprints. In addition, multiplying the average housing cost of \$300,000 with the 180

apartments in the site estimated the residential value. The result shows around 30 percent of the tax revenue will be generated by commercial and industrial use on the site and 70 percent by residential use, equal to the state average tax percentage.

Table 4: Estimated tax revenue from Oak Grove Village

Size	Square Footage	Amount of Assessed Value	Tax Rate	Tax Revenue (\$)	Percentage
Residential	300,000	54,000,000	13.32	719,280	71.50%
Commercial	100,000	10,915,555.56	13.32	145,395	14.50%
Industrial	200,000	10,532,833.33	13.32	140,297	14.00%

Source: Land value and building value from Medway Assessor's data

Cost of services impact

To understand the potential cost of services to the Town of Medway and the residents, who bear the greatest tax burden, the following tables detail the budget for the fiscal year 2007 and the average single-family tax bill. Education is by far the greatest expense. For this reason, taxpayers have a legitimate concern in an increase in the number of school children, which would increase the cost to the Town and the taxpayer burden even more.

Table 5: FY 2007 Medway municipal budget

Expenses	FY 07 Budgeted
Education Total	\$20,497,184
General Government	\$1,517,387
Town Wide General Government	\$9,030,913
Public Works	\$1,424,401
Public Safety	\$2,440,632
Health and Human Services	\$183,383
Culture and Recreation	\$283,111
Total Town Meeting Appropriation	\$35,377,011

Source: Town of Medway

Table 6: FY 2007 Medway average annual single family tax bill

Number of Single Family Parcels	3,587
Assessed Value of Single Family	\$412,451
Average Single Family Tax Bill	\$5,494

Source: Town of Medway

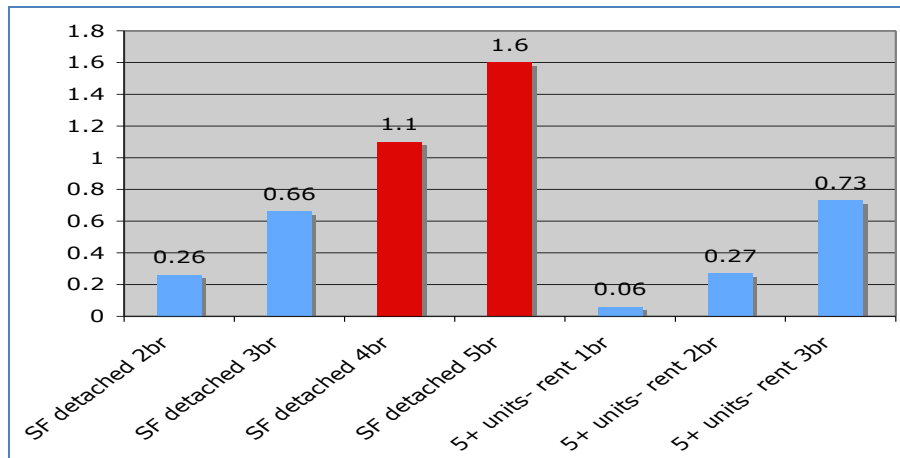
A 2006 study by the American Farmland Trust found that the median cost per dollar of revenue raised to provide public services to different land uses was greatest for residential uses. According to their study, it costs municipalities 4 times as much to provide public services for residential land uses than for commercial and industrial land uses. Usually, residential land uses do not cover their costs, so they are subsidized by other land uses. For this reason, commercial and industrial, as well as working and open land is generally favored over residential land use for maintaining a fiscal balance in a municipality.

School impact:

Our research found that the biggest concern surrounding dense residential development in Medway is the school cost impact. An increase in students in the town schools brings an inevitable financial impact to those schools and an increase in the average tax bill of homeowners. It is nearly impossible to prevent school cost impacts given new residential development; however, research suggests that the impact on schools from single-family residential development may actually be greater than from development of other housing types.

According to the US Census 2000 there were 4,248 housing units in Medway. The average household size of occupied housing units was 2.95 persons. Owner-occupied housing units had an average of 3.14 persons, while renter-occupied housing units had an average of 1.92 persons. Renter-occupied housing units had an average of 1.22 fewer persons than owner-occupied housing. If these averages are factored into school cost calculations, it can be assumed that renter-occupied housing actually has a lower impact on schools than expected because there are fewer people per renter-occupied housing unit. The following chart depicts the average number of school-aged children in different housing types in the State of Massachusetts. The data is based upon a 2006 study performed by the Center for Urban Policy Research at Rutgers University (Burchell et al.)

Figure 15: School-aged children per household type



Source: Burchell et. al., 2006

The most noteworthy factors are the two bars in red, which signify the most typical new constructions in the region: the 4 and 5-bedroom single-family homes. In contrast, the smaller single-family homes and renter units in buildings with 5 or more units actually produce fewer school-aged children. A recent study found that multi-family homes provide significant school cost saving benefits, described below.

“The net cost to the typical community (in Massachusetts), based on modest priced single-family homes with a \$250,000 assessment, will average \$5,000 per home per year. For typical mixed income development, only 43% of the communities experience net costs- and the average amount for each of them is estimated to be \$320 per apartment unit” (Carman et al., 2005).

According to the Medway Public Schools FY 2008 Working Draft Budget, total student enrollment in the public schools is expected to drop from 2,887 in 2006 to 2,856 in 2007 and to 2,833 in 2008. The total cost to taxpayers for school funding, however, is expected to increase to \$16,493,135 (Draft Budget, 2008). In FY 2005 the cost to taxpayers to operate all schools was \$15,407,031; \$15,530,185 in FY 2006; and \$15,975,174 in FY 2007. As the number of school children is expected to decrease from 2006 to 2008 the cost to taxpayers for operating schools is expected to increase (Medway Public Schools, 2007).

The cost of operating schools in Medway incurred by taxpayers could potentially be offset by development of other uses that do not produce school-aged children. Additionally, the expected decrease of school-aged children is another reason why additional development will not tremendously impact the town. The town can also choose to promote additional school children as a benefit to their future, particularly given the demographic trends of losing people in the emerging workforce and middle age workers (30-45 year olds).

Recommendation

A mix of uses is the most feasible development scheme on the site. These uses should include some mix of office, commercial and industrial properties to reduce some of the burden to taxpayers, as well as modest renter units to retain the workforce age cohort and lower to middle-income persons. Since Grubb & Ellis reported that the Metrowest market had mediocre performance in a number of economic respects, a combination of commercial and industrial property could diversify the town's risk. Industrial parks are scarce in Medway, and the site is very well situated close to Route 495 for industrial uses.

Market trends show that mixed-used developments are popular. If well designed, the market could absorb a 50/50 residential and commercial development. A mixed-use development in the Oak Grove Bottle Cap Lots site could be attractive for commuters and also could attract shoppers from off site. Research has demonstrated that for walkable communities to be successful residents must have access to a number of necessary amenities. Development on the Medway site should include some retail and commercial properties in order to provide these necessary amenities. The analysis in this section provides optimism that the site can provide opportunities for industrial, commercial, office, and residential growth, and that together they can satisfy many goals.

Based on the fiscal impact and school cost analysis, the site will provide cost saving benefits by creating mixed-used development that requires fewer services and produces less school children than the single-family developments found in Medway. The savings will multiply if the projected decrease in school children continues over the next 20 years. The implementation of the c. 40R district, which will be addressed in the regulation section, will aid the town in absorbing unforeseen school cost. The data shows that such site development will aid in improving the town's fiscal condition by bringing additional revenue that will provide some relief for taxpayers. The creation of a workforce mixed-use development will allow the Town of Medway to add alternative and affordable living arrangements that adequately address the needs of the town residents and increase the town's employment base.

4: SITE DESIGN

4.1. Goals and Objectives

The aim for this studio was to create a viable workforce housing development that would also diversify the municipal tax base. The design team worked together with planners to develop five main goals in order to suggest a site planning strategy that would meet those town-wide goals. The first goal of the design was to offer a variety of housing options to bring workforce to the MetroWest region while providing for existing residents and people of different ages and incomes. Two and three-story townhouses have been designed at 10 units/acre and apartments at 15 units/acre with a mix of affordable and reasonably priced market-rate units with a modern spin on New England architecture.

A positive fiscal impact has been ensured for the town and its residents by introducing a 200,000 sq ft of industrial development and 185,000 sq ft of commercial development along with a sewer connection to the site. Connectivity to the region has been established by providing a transit stop in the main commercial block on Route 109 and by providing walkable, safe streets with sidewalks and a hiking trail network. The design has promoted sustainability by maximizing solar gain with south-facing windows and by managing all storm water on site through a system of aesthetic swales and ponds. Finally, a high percentage of open space has been provided to be shared by residents and employees alike. This was accomplished through the preservation of existing woodland and by creating public green spaces, public plazas, and also private gardens.

4.2. Program

The Medway site is comprised of approximately 100 acres. Of these, only about 50 acres (2,178,000 square feet) are developable after accounting for wetlands (24 acres), the Cybex facility (5.4 acres), roads and existing houses. The goal of our client, as well as for this studio exercise, is to provide workforce housing on this site; the needs of the town also include achieving a greater share of their property tax base from commercial owners. We have therefore accommodated residential, industrial, and commercial/retail uses in our program for the Oak Grove Bottle Cap site. We have programmed the land use for the 50 acres of developable land as follows:

Table 7: Site land use breakdown

Use	Site Percentage	Square footage
Residential	15%	325,000
Industrial	9.2%	200,000
Commercial/retail	8.5%	185,000
Public open space	35%	740,420
Private open space	3.3%	71,900
Parking	15%	326,700
Roads and utilities	15%	326,700

4.3. Site Analysis

In order to determine the best design for this site guided by the percentage breakdowns above, it was necessary to study the existing physical site conditions. The Oak Grove Bottle Cap site is located at the Medway/Milford town line just east of I-495. It is bordered by Route 109 to the North, West Street to the east and Alder Street to the south. Trotter Drive runs north-south through the site, providing access to the Cybex facility.

The soils on the site are comprised of wetland soils in addition to Canton-Charlton fine sandy loam. These soils are excessively well-drained and vary in size from stones to boulders. In terms of the design, good infiltration of storm water is likely and the stones can also play a part as an aesthetic feature on this site (USGS Soil Survey).

The landform for this property is gently undulating throughout with no significantly steep slopes. The high points are 276 feet above sea level and the low point is at 246 feet with a maximum grade change of only 30 feet. The land steps down from a centralized ridge area toward the wetlands and the roads that bound the site. Because of this, a storm water management system must be enacted that will catch and treat runoff before it arrives at the low points and runs off site.

Wetlands cover approximately 25 percent of our site (24 acres) and continue into the neighboring town of Milford. Construction within 25 feet of this resource is completely prohibited. Also, since a perennial stream runs along the western border of the site and is culverted under Route 109 and Alder Street, building cannot occur within a designated 200' buffer.

Three distinct types of vegetation exist, the first of which are wetland species over 25 percent of the site. An upland canopy forest of mainly white and black oak in various stages of succession exists along with a few major stands of white pines. The Oak Grove site is predominantly forest with a small amount of water and pasture.

Approximately 70% of the property is zoned industrial while 30 percent is zoned residential and agricultural II which allows two dwelling units per acre and required 35 foot setbacks.

4.4. Early Concepts/Schematics

Campground Concept

The initial design concepts revolved around the site history and sustainability through preservation of existing woodland and creation of open space. The first schematic design, the “Campground Concept,” emphasized the history of this unique site in which hundreds of tiny parcels of land were given away in the Cliquot Club soda contest as camping lots.

Figure 16: Campground Concept 80 Scale Plan



In keeping with the theme of this woodland as camping ground, the goal was to preserve as much of the existing vegetation as possible and to utilize narrow gravel roads for vehicular access. Small pockets of trees were strategically plucked from the forest in order to nestle the housing units carefully into the environment. The preserved woodland, the most unifying feature of the site, would continue to provide habitat to animals as well as filter sunlight providing delicate patterns of light in all seasons. A network of hiking trails from the houses through the woods and down to the wetlands completes the campground theme and provide for recreational needs.

Greenbelt Concept

The second concept utilized two classic examples of spatial organization which created two significant open space networks—a series of small open spaces with one central public space and a greenbelt linking the industrial and residential sides of the site. The design team took looked to Ebenezer Howard's Garden

City model in which the architecture defines a centralized green space and a greenbelt forms a concentric ring around that architecture.

Figure 17: Greenbelt Concept 80 Scale Plan



In the “Greenbelt Concept,” this open space system would serve as a pedestrian connection throughout the 100 acre site. Further, Stein and Wright’s housing “superblock” found in Radburn, New Jersey, was used to create public courtyards that are accessible to each housing community with shared parking lots on the outside of the units. By using both of these models, the team was able to completely separate pedestrian and vehicular movement through a series of systems.

In both of these schemes, a mixed-use corridor was proposed along the site’s northern boundary, Route 109, to help alleviate the tax burden that Medway residents are currently facing.

4.5. Final Concept

The early stages of schematic development proved useful in guiding the final design concepts by maintaining the same underlying themes: the site's history, vegetation cover, and historic models for designing systems across the site.

Transect Concept

The design alternative which has been developed to completion is the "Transect Concept." This scheme combines the idea of preserving some woodland from the Campground Concept with a greenway as a trail and pedestrian network from the Greenbelt Concept to form a buffer from the existing single-family houses off the site. This greenway also serves as the last level of retention for our on-site storm water management system.



Figure 18: *Transect Concept 80 Scale Plan*

The Transect Concept takes the model from the Congress for New Urbanism, which marks stages of transition from urban to rural land uses and from highest to lowest density, respectively. This model was applied to this mixed-use site by keeping the light industrial and commercial uses on the western portion of the site already zoned for industrial. The densest housing then occurs in the form of mixed-use development with first floor retail/commercial and upper floor high-density apartments and condos. Moving east across the site, this density lessens to 10 unit per acre townhouses arranged in Radburn “superblocks” and finally to multifamily houses integrated with existing single-family detached houses along West and Alder streets. These larger-footprint multi-renter units assimilate into the existing landscape with their New England-style architecture and provide a visual low-density buffer to the site from existing houses off-site.

In the initial versions of this scheme, an attempt was made to integrate the Cybex facility with the design as a whole. A realignment of Trotter Drive further to the east was proposed to allow commercial buildings to be built on its west side as well as a park area to be utilized by Cybex employees and residents alike. A hotel and conference center was also proposed on the east side of Trotter to create a transition from industrial buildings to residential following the transect model. The realignment of the road would have provided the opportunity for an entry space or gateway defined by mixed-use architecture. Its one-way secondary entrance would have served as a bus stop and drop-off zone. The parking for commercial and retail buildings in this scheme was located off the road and behind the buildings for greater visual appeal, as supported by a study by the Center for Rural Massachusetts.

The decision, however, to realign the main thoroughfare through the site was not financially feasible. Secondly, parking lots which were hidden from view of the main road are less apt to bring business to the commercial area than those in plain view. Therefore, the preferred design alternative outlines newly-configured industrial and commercial districts as well as adjustments to the residential zone in response to exploration of design in detailed plan and section.

4.6. Preferred Design Alternative

The Oak Grove Bottle Cap site provides an opportunity to create a western gateway for the town of Medway. It also provides the opportunity to revitalize the town’s tax base and to integrate a much needed workforce housing neighborhood. The schematic master plan for the preferred design alternative includes industrial buildings, a mixed-use corridor along route 109 and a residential development to the east of Trotter Drive. The industrial and commercial layout consists of flexible structures that could accommodate a variety of businesses.



Figure 19: Example of mixed use first floor retail/ second floor residential and office

The mixed-use corridor along route 109 will provide an architecturally defined gateway for people entering Medway from route I-495, creating a sense of arrival for the town. Tree-lined sidewalks, on-street parking and additional parking lots viewable from the road will encourage use of the commercial and retail stores on ground floors. Apartments on the upper floors will be at 15 to 20 units per acre. None of the structures will exceed four stories.



Figure 20: Recommended full site design alternative

The industrial complex includes the existing Cybex facility and accommodates the future expansion of the exercise equipment manufacturer. It will provide a gateway to the proposed industrial belt that will extend south into Bellingham. An increase of 200,000 square feet of industrial structures and an addition of 185,000 square feet of commercial in this scheme would help diversify the property tax base and take some of the financial burden for town services off the homeowners of Medway.

Because of the residential focus of the studio, the neighborhood area was designed in greater detail to create the master plan shown on page 36. The plan consists of 180 units at 10 units per acre, organized

into 11 neighborhoods. Four of these neighborhoods related to a large central open space, and seven relate to a green belt.

Figure 21: Oak Grove Village Master Plan



A transition from the higher density commercial and industrial area to a more residential area was provided. To achieve this, the denser development and commercial structures were located along Route

109 with a hotel/conference center along Trotter Drive. As one moves southeast density decreases and structures transition to residential with a low density buffer along the eastern perimeter of the site (see concept Transect model in Figure 23 below).

Figure 22: Neighborhood layout

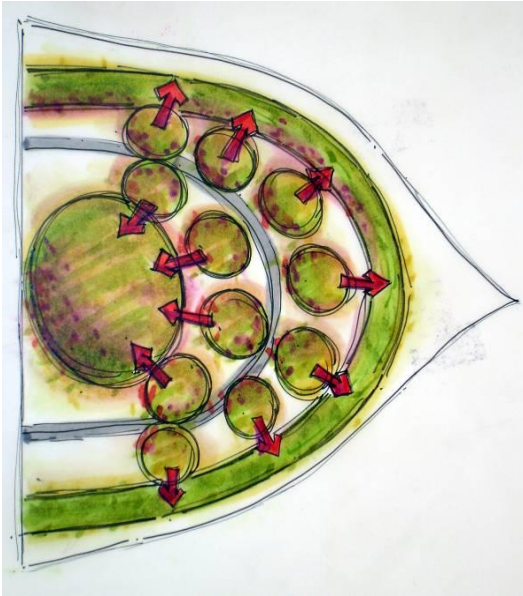
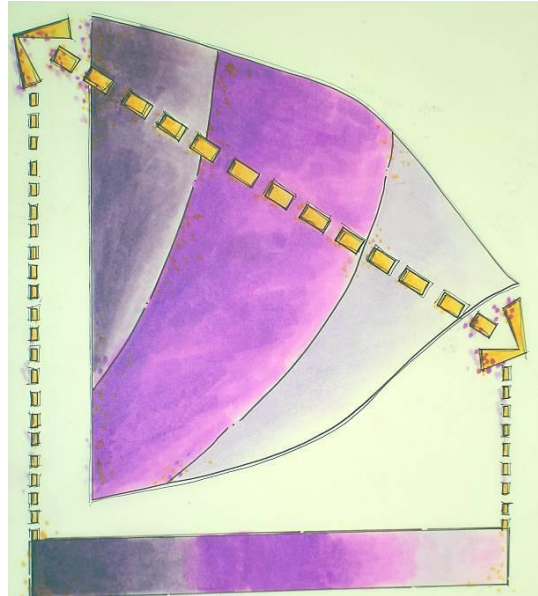


Figure 23: Transect model



The 11 neighborhoods share a public open space (Figure 22 above). This gently sloping glade is just large enough to host a soccer or football game and is surrounded by a stream like swale system. Storm water management is handled on site (see Figure 24 below). Water is first captured in the central ring of retention that surrounds the public open space. Water then travels through gravel-lined swales and reaches small basins at the ends of the parking lots. From here, any overflow reaches the final ring of retention within the green belt along the main pedestrian path.

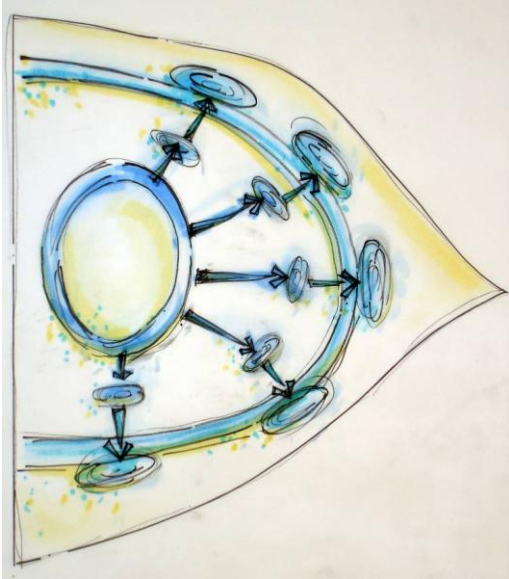


Figure 24: Storm water management system diagram

Each housing cluster surrounds a community open space. Each unit has a private garden which is an extension of their indoor living space. These private gardens overlook the small greens defined by architecture and trees. A secondary path leads from the units to the primary hiking trail that connects to the wetland area on the western portion of the site. The design team has provided a variety of housing types with floor areas ranging from 800 to 1,200 square feet for townhouses. Prices would range from \$140,000 to \$210,000 which is much more attainable for the workforce.



Figure 25: Oak Grove Village housing neighborhood cluster



Figure 26: Community open space



Figure 27: Hiking trail connecting to secondary pedestrian loop

Medway Design Recommendations

The architectural style provides a modern spin on the local vernacular. Sustainable materials and methods would be employed. Medium Density Outerboard (MDO) will be used for the siding. Unlike wood siding, MDO is extremely durable and does not need to be replaced. High R-value windows and structurally integrated panels help to insulate the units and reduce heating costs. Recycled standing seam roofs with slightly reflective surfaces will help reduce heat island effect. Units will be plumbed for active solar/thermal and share wet walls to reduce cost. Units have small footprints but open floor plans and the extension of living space into the garden make them feel more spacious.

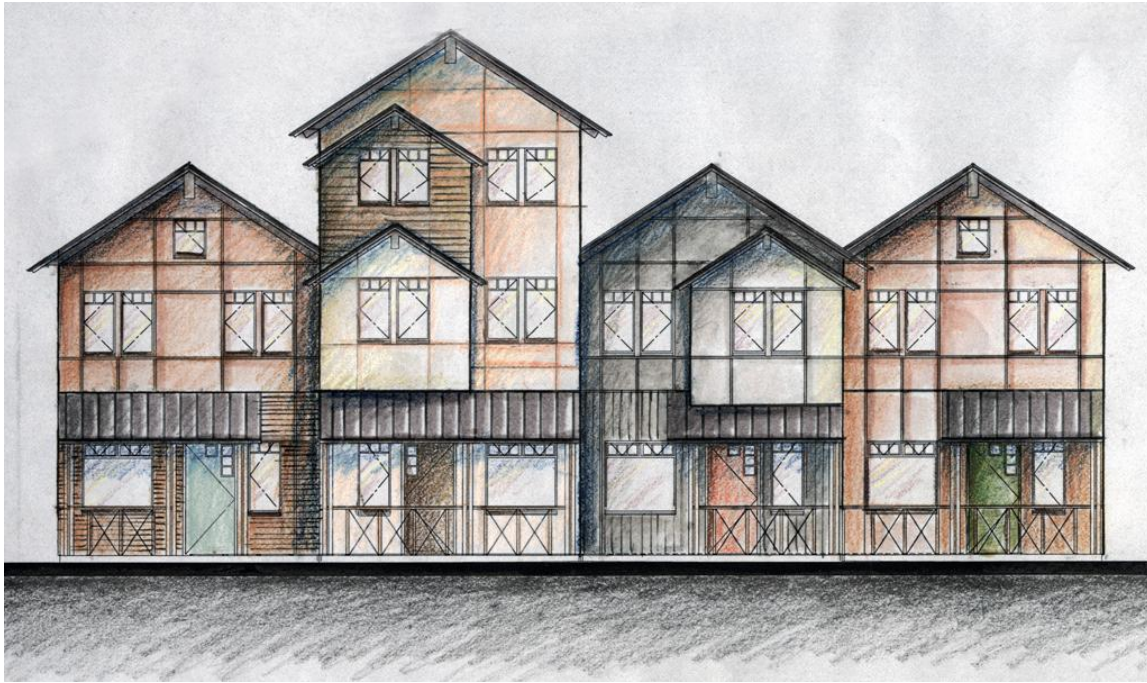


Figure 27: Local vernacular with modern edge and sustainable materials



Figure 28: Section through parking lot, row houses, private garden and community open space.



Figure 29: Section through row houses, community open space and pathway.

4.7. Summary

This preferred design alternative proposes a mixed-use gateway for the town of Medway that accommodates industrial growth. It also incorporates a viable workforce housing development with a variety of housing types and neighborhood character.

5: REGULATORY ANALYSIS and RECOMMENDATIONS

This chapter presents an analysis of the existing regulatory environment for the site of the proposed Oak Grove Village. Potential regulatory approaches are evaluated and two recommendations are offered.

The principal findings are:

- Medway's current zoning for the site does not permit the residential densities necessary to achieve work force housing, or "traditional neighborhood density," of the proposed Oak Grove Village design.
- Medway's current commercial and industrial districts do not provide sufficient flexibility to respond to changing market demand for varied uses of the project site in the long term.
- The absence of mixed-use zoning in Medway and the four other municipalities within 1-mile concentric buffers of Exits 16-20 suggests that a mixed-use approach at the Oak Grove site could be a competitive advantage in attracting commercial and retail businesses to the town's Route 109 western gateway.
- The combination of traditional neighborhood densities and mixed-use overlay district envisioned by the Oak Grove Village proposal present a strong case for eligibility as a Chapter 40R Smart Growth District, which could aid Medway in securing funds to offset potential additional school costs from new development.

The two recommendations offered involve the creation of an overlay district along Route 109 and in the residential portion of the site bounded by Trotter Drive, West Street and Alder Street (existing Industrial zoning would remain unaltered). Research indicates that mixed-uses may achieve more sustainable land uses and a better overall balance of tax revenues, a key priority of the town. The first of these recommendations would be a "traditional" mixed-use district that would allow a greater variety of uses, including higher density residential, commercial, retail and light industrial. The second recommendation would seek to achieve this mixed-use environment using through a form-based code that would focus on the appearance of structures and their relationship to the immediate environment.

5.1. Analysis of Existing Regulatory Conditions

This section provides a summary of existing municipal zoning and state laws that may be involved in implementing the Recommended Site Concept.

Zoning Base Districts Summary

The Town of Medway has three base zoning districts shown in Figure 29 below:

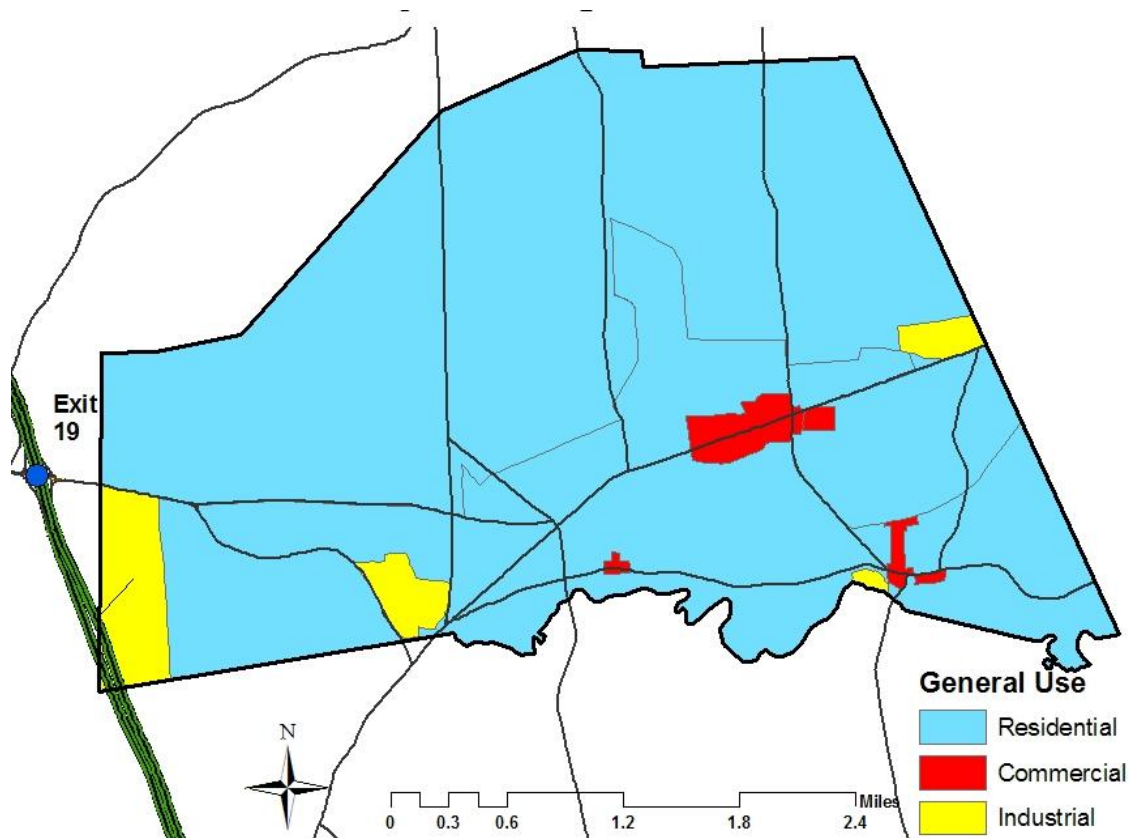


Figure 25: Medway Zoning

Source: MassGIS, Town of Medway

- Agricultural/Residential I and II (93.6% of town land): District I allows single family homes at 1 dwelling unit per acre (du/ac). District II allows single family homes at 2 du/ac and two-family homes at 2.5 du/ac. Three-family homes and apartment buildings are not allowed.
- Commercial I, II, III, IV, and VI (1.6% of town land): All four commercial districts have consistent lot size minimums of 20,000 sq ft (.46 ac), a maximum building height of 40 ft, and maximum building coverage of 30%. Setbacks vary from 35 to 50 ft and parking requirements vary from 200 sq ft per space to 300 sq ft per space. Retail is not allowed in Commercial District II.
- Industrial I, II and III (4.6% of town land): Minimum lot size ranges from 20,000 to 40,000 sq ft, and minimum setbacks are all 30 ft. District II allows electric generation and transmission facilities.

Table 8: Medway zoning bulk requirements summary

District	Min Lot sq ft	Frontage ft	Front Setback ft	Maximum Bldg Coverage	Principal Use	Parking	Buffer
Ag/Res I	44,000	180	35		SFM		
Ag/Res II	22,500	150	35		SFH & MFH		
Commercial I	20,000	100	50	30%	Retail, Office, Municipal	200 sq ft: 1 space	
Commercial II	20,000	100	50	30%	Office only	200 sq ft: 1 space	
Commercial III	20,000	100	35	30%	Retail	300 sq ft: 1 space	
Commercial IV	20,000	100	35	30%	Retail, office		
Commercial VI	20,000	100	35	30%	Retail, office	300 sq ft: 1 space	50ft on south line
Industrial I	20,000	100	30	40%	Industrial	1 space: 2 employees	30 ft to residential
Industrial II	20,000	100	30	40%	Electric generation permitted	1 space: 2 employees	30 ft to residential
Industrial III	40,000	100	30	40%	Industrial	1 space: 2 employees	200-ft res. buffer

**Commercial V eliminated in 1999; Industrial IV eliminated in 2003.*

Zoning Overlay Districts Summary

The Town of Medway has one special open space district and two overlay districts:

- Open Space Residential District: The provisions of this district are available only in Agricultural/Residential I and II districts to protect open space. Density bonuses are allowed (dependent on amount of buildable land) for maintaining 50% open space to be deeded to Town, nonprofit or owners association. A mix of housing types and high quality landscaping are required. Minimum frontage of 50 feet and common driveways are allowed to reduce built areas. Up to 10% of open space may be used for recreation (i.e., bike path, trails, parks). A special permit is required.

- **Adult Retirement Community Overlay District:** This district allows age-restricted development for adults age 55 and older by special permit. The development must be on a minimum of 10 acres. A density bonus of up to 9 du/ac is allowed, depending on residential configuration. The open space requirement is 50%; waivers are possible. Required frontage is 250 feet.
- **Adaptive Overlay District (adopted 2004):** This district promotes economic development and the preservation of historic structures in commercial districts by allowing re-use of existing structures for retail, commercial and/or residential uses. Combined uses in one structure require a special permit.

Medway Subdivision Control Law

Medway's subdivision control laws ensures that lots will be provided adequate access to the street in ways that are "safe and convenient." They also coordinate the roads within the subdivision so that they are suitable to Medway and surrounding towns. The purpose of these regulations is to provide for the overall safety of town residents from fire, flood and other emergencies. In doing so, they require that adequate access is provided for emergency vehicles (fire, police, etc...) and maintenance equipment. The regulations recognize the importance that each lot is provided adequate water, sewerage, drainage, and utilities.

In addition to town safety, subdivision control laws can regulate some landscaping aspects that are important such as adequate street lighting and sidewalk width. Also, the laws are used to enhance the natural beauty as well as the rural and historic character of the community.

The unusual number of small lots to be consolidated for this project poses significant parcel consolidation and subdivision challenges, and a new subdivision plan will likely be required before development can take place.

Site Plan Approval

Planning Board approval of a site plan for any new development will be required pursuant to municipal and state zoning regulations. Building Permits will not be issued until Site Plan Approval is offered through a Certificate of Recommendation from the Planning Board to the Board of Selectmen.

Site Plan Approval is not required for as-of-right residential structures located in residential zoning districts. Site Plan Approval is required for construction and alterations to other uses. A multi-family residential structure does not require Site Plan Approval if overlay makes it an as-of-right use in the project area.

Wetlands Protection

Compliance with local and state wetlands regulations will be critical to the successful development of the Oak Grove Bottle Cap Lots site, as wetland resources exist on approximately 25% of the area according to MassGIS layers. The Wetlands Bylaws set forth a 100-foot buffer area surrounding resource areas and approval from the conservation commission is needed to build anywhere within this buffer. Construction within 25 feet of a resource, however, is completely prohibited. Since a perennial stream runs through the western edge of the site, construction is further restricted by a state-mandated 200-foot buffer. Field delineation will be necessary to determine the precise extent of these resources and appropriate mitigation to comply with the Massachusetts Wetlands Protection Act and Rivers Protection Act as administered by the Medway Conservation Commission.

State Regulatory Environment

Successful development of the Oak Grove Bottle Cap Lots site will require compliance with a series of state regulatory requirements. Foremost among these will be those related to smart growth and housing production, as embodied in Chapters 40B, 40R and 40S of the Massachusetts Zoning Act. Discussion follows.

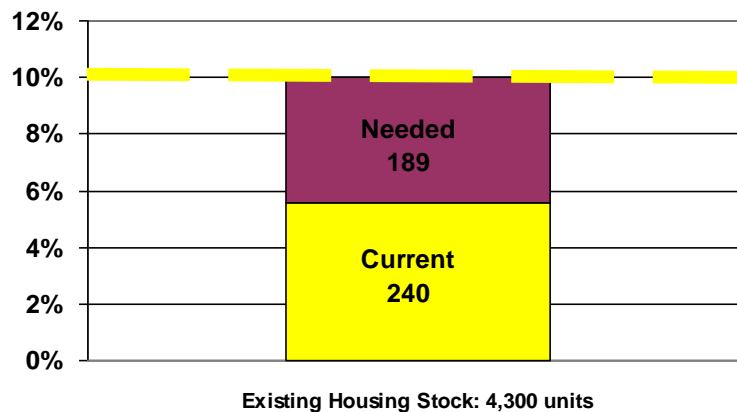
Chapter 40B Affordable Housing Comprehensive Permit Law

The site proposal offers an opportunity for Medway to meet and surpass the 10% goal for affordable housing established by Chapter 40B of Massachusetts zoning laws, as well as Medway's own goals to increase the availability of affordable homes to residents (Town of Medway Master Plan 1999).

Currently, 5.6%, or 240, of Medway's approximately 4,300 dwelling unit are affordable, according to the definition of affordability established by the U.S. Department of Housing and Urban Development.² An additional 189 affordable homes, either rented or purchased, are necessary to achieve the 10% goal and relieve the town of the obligations of the Chapter 40B Comprehensive Permit process. Research has found most towns prefer to work with a "friendly" Chapter 40B developer willing to address municipal needs rather than lose zoning control under the Comprehensive Permit.

² Affordable units are those that are affordable to households earning 80% below the area median income (AMI) established by HUD.

Table 9: Medway Chapter 40B Affordable Housing Status



Source: U.S. Census, MAPC

In order to count as a 40B project, 25% of all the development’s residential units need to be set aside as ‘affordable’ units under this definition.³ Municipalities that do not meet the 10% minimum affordable housing requirement, must provide developers of affordable housing with a streamlined process through the permitting phase. In addition, developers may also build multi-family structures or single-family houses at higher densities than normally permitted through local zoning.

Since it was enacted in 1969, Chapter 40B has successfully encouraged affordable housing by allowing the construction of many projects that most likely would not have been built under the existing zoning regulations. However, many communities remain wary of it because it limits their control over what gets built and where. Therefore, many municipalities proactively seek out residential development projects that address important provisions of local zoning to avoid having a 40B project that accommodates few municipal needs imposed in the future (Citizens Housing and Planning Association 2006, Hill 2005).

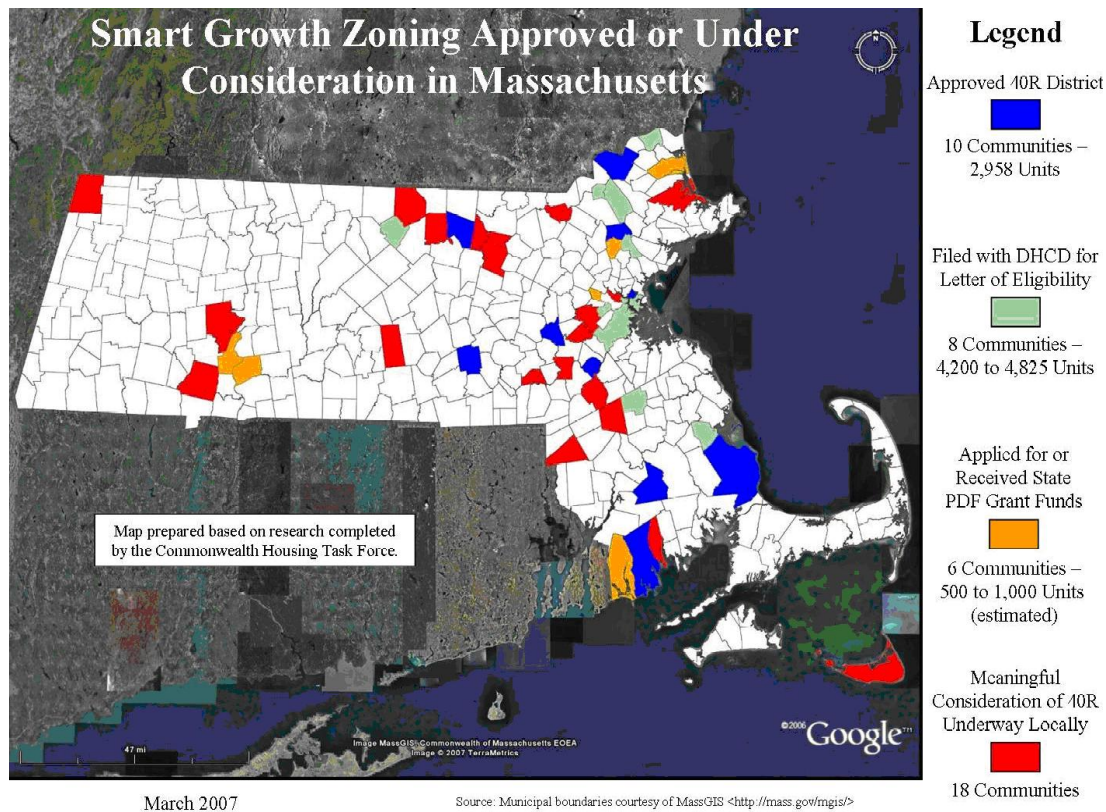
If two of every three units of the proposed Oak Grove Village were sold as affordable, or if 25 percent of at least 189 units are rented as affordable, Medway would satisfy its Chapter 40B goal.

5.2. Chapter 40R Smart Growth Districts

The Oak Grove Bottle Cap Lots site represents an opportunity to make use of Massachusetts’ Chapter 40R legislation for “Smart Growth” districts. Table 5 shows communities in Massachusetts that have been approved for a 40R district as well as communities that are interested in adopting one.

³ Through long-term affordability restrictions.

Table 10: Chapter 40R communities status as of March 2007



Source: Bluestone 24-April 2007; MassGIS

To receive approval for 40R status, a municipality must adopt a Smart Growth Zoning District to make them eligible to obtain state funds. These funds include a one time density bonus of \$3,000 for each unit, awarded to the municipality upon issuance of a building permit, plus incentive payments of up to \$600,000, depending on the number of units. The new district essentially acts as a zoning overlay in a chosen area or areas. This type of zoning allows a developer to choose the existing zoning or use the underlying Smart Growth Zoning District, thereby enabling some flexibility and encouraging creativity on the part of the developer.

To be considered an “eligible location” for 40R approval, the proposed district must be within one-half mile of a “transit terminal,” which includes rapid transit, commuter rail, bus, and ferry terminals. The district must also be in an “area of concentrated development,” such as a city or town center or near existing commercial districts. Finally, utilities, land and transportation access must be underutilized.

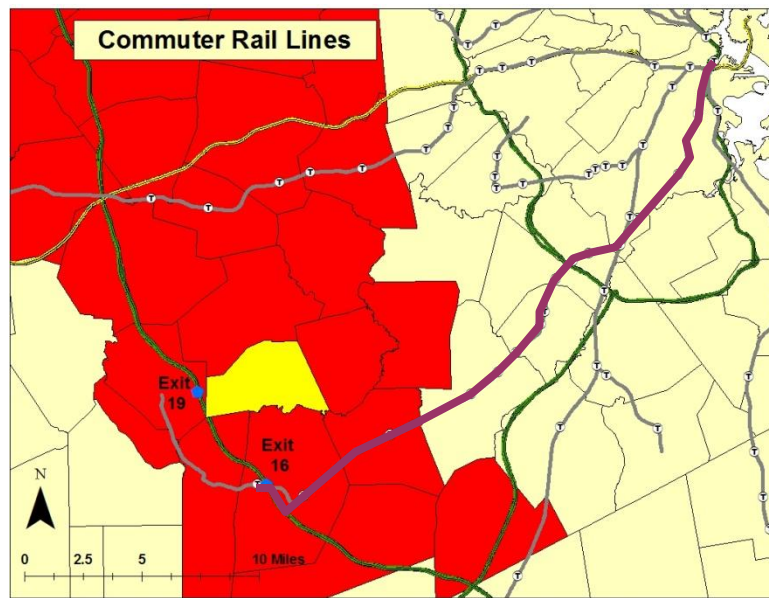
The following are some of the key additional Chapter 40R requirements for a Smart Growth Zoning District:

Medway Design Recommendations

- The zoning ordinance must provide for the residential uses to permit a mix of housing for families, individuals, persons with special needs, or the elderly.
- Housing density allowed in the developable land area of a proposed district must be at least:
 - 20 units per acre for multi-family housing;
 - 8 units per acre for single-family homes;
 - 12 units per acre for 2 and 3 family homes.
- Provide that not less than 20 % of the residential units constructed in projects of more than 12 units will be affordable, and ensure that not less than 20 % of the total residential units constructed in each district will be affordable.
- Permit infill housing on existing vacant lots and additional housing units in existing buildings.
- There must be full compliance with federal, state and local fair housing laws.
- The proposed district may not exceed 15 percent of the total land area in the municipality.

The Oak Grove Bottle Cap Lots site may qualify for state funding because it meets several criteria for an eligible location. It is within one-half miles of I-495 Exit 19, which would mean new development could utilize existing transportation infrastructure. In addition, the future sewer line will bring significant new utility capacity to the site which would otherwise be underutilized. The site is also only four miles north of the Franklin I-495 MBTA Commuter Rail station, so a requirement for transit service, such as a shuttle to the Medway town center and an express shuttle to the Franklin I-495 MBTA Commuter Rail station, could aid in meeting this criteria. Also, the Bottle Cap Lots site is home to Medway's largest corporation and future mixed use of the site could help achieve the 40R requirement that the proposed district be near current and future areas of concentrated development. A significant number of trips are already generated by the site everyday, and MassHighway traffic counts for 2005 estimate 15,000 to 18,000 average daily vehicle trips (ADT) past the site entrance at Trotter Drive. Currently, little multi-family housing exists along I-495. Due to its location, the site would be highly suitable for dense housing and mixed-use development. Residents could easily access I-495 and enjoy the benefits of walking to the grocery store, bank, or daycare.

Table 11: Medway commuter rail access – Franklin Line



Source: MassGIS

Chapter 40S Smart Growth School Cost Reimbursement

In nearly all communities throughout Massachusetts, the potential cost of public education for new students who may reside in proposed development is a leading concern in the evaluation of new projects. This concern arises from the fact that the cost per pupil to a town is significant (in Medway it ranges from approximately \$7,000 to \$9,000 per year, according to the Medway School District and Massachusetts Department of Housing and Community Development). This typically leads to the situation where the cost of all community services for new development exceeds the property tax revenues received from new households. In the specific case of Medway the student costs are a concern, as additional funds are not available for an increase in students.

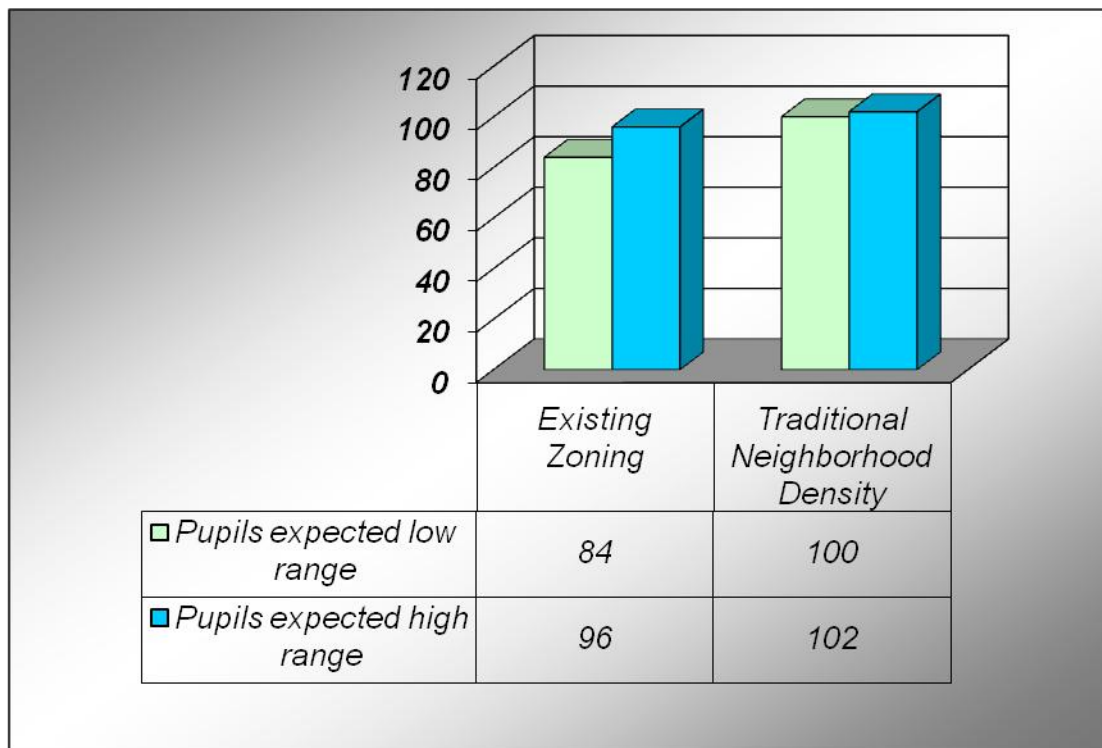
In order to help mitigate these school cost impacts from new development on municipalities, in 2005 Massachusetts Legislature created Chapter 40S, known as the Smart Growth School Cost Reimbursement. State funds from the Chapter 40S program are available to municipalities with an approved Chapter 40R Smart Growth district and document the additional cost of new students. (At this writing, Chapter 40S funding is being debated in the Legislature for the 2007-08 state budget.)

Assuming eventual site build-out will occur, establishing Smart Growth eligibility is essential to recouping additional public school costs resulting from new pupils living in new development. Families in apartments and townhouses have far fewer children than those living in single-family homes (Rutgers 2006). The rough calculation provided in Table 7 uses the Rutgers pupil per household findings to

illustrate that the number of public school children that can be expected with the 2- and 3-bedroom units proposed under Traditional Neighborhood Density will be approximately the same (96 versus 102) under a build out of single family homes, as allowed by existing zoning.

Chapter 40S provides the reimbursement to ensure that local education costs from new development does not exceed property tax revenues.

Table 12: Pupil impact estimates – Existing zoning vs. Bottle Cap Lots Site at full build out



Under Existing Zoning, 70-80 single family homes could eventually be built on the 40 acres of developable land. Using the Rutgers finding of 1.2 pupils per home, approximately 84 to 96 pupils could be expected under this scenario. If the 300 homes of the Oak Grove Village proposal were built, there would be 300 homes – 255 two-bedroom units at .27 pupils per unit, and 45 three-bedroom units at .73 pupils per unit, resulting in 100 to 102 new pupils. This demonstrates that denser housing can bring roughly the same impact to local schools as existing zoning; however, under existing zoning, Medway is not eligible for full reimbursement of the cost of additional pupils, as offered by Chapter 40S.

NPDES Phase II

The low-impact stormwater management system proposed for the site would help Medway meet new federal environmental standards. The 2001 revisions to the National Pollution Discharge Elimination System Stormwater Runoff, known as NPDES Phase II, may affect the Bottle Cap Lots site because Medway is classified by USEPA as an “urbanized area” for the purposes of regulation under this legislation. NPDES is a federal program administered by the states; however, in Massachusetts, the USEPA is the administering authority. Therefore, all development will need to comply with NDPEs Phase II requirements to minimize impervious areas, design stormwater systems to handle two-year storms and maximize on-site stormwater re-charge.

State Historic Preservation Office & Massachusetts Environmental Policy Act Office

The Massachusetts Historical Commission as well as the Massachusetts Environmental Protection Agency will need to be contacted if the town secures any type of public funding for development as the site potentially could be considered a historic and cultural resource. A review process is mandated by Section 106 of the National Historic Preservation Act and the National Environmental Policy Act at the federal level as well as Massachusetts General Laws Chapter 9 and the Massachusetts Environmental Policy Act at the state level. The 242 parcels that form the majority of the site resulted from a contest that gave individual tracts of land measuring less than 1,000 square feet to those with a winning bottle cap. Most of these lots never saw any type of construction, but the subdivision plat still exists, complete with paper streets. Table 8 shows the location of the 242 remaining Bottle Cap lots.

Figure 261: Remaining Bottle Cap Lots parcels



MassGIS; Medway Assessors Parcels 2006; lots smaller than 1,000 sq ft

Massachusetts Opportunity Relocation and Expansion (MORE) Program

The Town of Medway applied for and received assistance from the Commonwealth through the MORE program for partial funding of the sewer line extension to the Industrial Park. MORE criteria are geared to support projects that offer substantial job growth; the applicant must demonstrate that development will be served by the new infrastructure as well as create a minimum of 150 new jobs for five years.

5.3. Regulatory Objectives

Research and outreach in the community and region established the following key objectives for development of the Bottle Cap lot.

- ☐ Achieve Workforce Housing/Traditional Neighborhood Density of 10-15 du/ac.
- ☐ Allow multi-family homes and apartments but discourage detached single family homes.
- ☐ Encourage mixed-use for maximum long term market flexibility, including residential, office, and retail.
- ☐ Encourage compact development and low-impact development to achieve sustainability.
- ☐ Qualify the development for Ch. 40R by achieving required “smart growth” density, transit and other thresholds.
- ☐ Include open space requirements of at least 30% to preserve contiguous habitat and aid in stormwater management.

- Include passive recreational facilities accessible to all town residents.
- Include developer incentives by allowing some uses or structures by-right or with limited use of special permit.
- Maintain existing Industrial III zone and allow for future expansion to the south.

These objectives translated to the criteria used to evaluate the relative advantages and disadvantages of different regulatory approaches. In the end they were embedded in the final two recommended approaches.

5.4. Regulatory Approaches Considered

The studio team identified a range of possible regulatory approaches for achieving the objectives at the Oak Grove Bottle Cap Lots site. These included:

1. New mixed-use base zoning bylaw to replace existing base residential and portions of industrial zoning.
2. New mixed-use overlay zone to allow existing zoning to remain but offer mixed-use alternative.
3. Planned unit development (PUD) with mixed-use provision.
4. Form-based zoning overlay to proscribe highly specific building forms, setbacks, landscaping and other site requirements.
5. Floating zone with mixed-use options and/or form-based requirements.
6. Performance-based requirements incorporated into one of the options above.

From this range of approaches, four candidate strategies were developed and evaluated for achieving the objectives. There was general agreement among stakeholders that existing Industrial III zoning should remain intact.

CANDIDATE 1: Mixed-Use Base District

This approach would completely replace the parts of the Agricultural/Residential I & II and Industrial III that fall within these boundaries. This would likely be difficult to pass at Town Meeting, as property owners within the proposed district may express concern over their property values. An additional disadvantage is that it adds another base district to the zoning map, which further parcels the town. The significant advantage of this type of regulatory approach is that it can effectively prohibit uses such as single-family detached homes.

CANDIDATE 2: Mixed-Use Overlay District

As an overlay, this district would be geographically delineated on the town zoning map, but protect uses allowed under base zoning. The advantages to this approach include the allowance of a wide variety of uses to respond to the market; the town's familiarity with the existing Adaptive Re-use Overlay District; existing model bylaw language is readily available; protection of the base zoning for Cybex, the town's largest employer. A special permit would be required for nearly all uses, giving the Planning Board greater control than the existing base zoning allows. Developers would find the mixed-use zone attractive because of the increased density that would be allowed (apartments above retail). This would also allow uses, which the Massachusetts Alliance for Economic Development has identified as amenities to industrial and business parks, to complement the future build-out of the industrial park. Two main disadvantages exist with this approach. Requiring developers to obtain a special permit for almost every use places a financial burden on them. In addition, an overlay does not prevent the development of uses like single-family homes, which works against the above objectives.

CANDIDATE 3: Form-based Overlay District

As an overlay, this district would be geographically delineated on the town zoning map, but protect uses allowed under base zoning. The advantages to this approach include a high degree of local control over the actual form and function of any new structures that would be built—whether they are for residential, retail, commercial or light industrial. The end result is a product that is aesthetically pleasing and integrates well into surrounding communities. Unlike the special permit required for the traditional overlay district, structures that conform to the form-based code can be built as-of-right, as well as at greater than existing densities. This would provide developers with significant incentives as they would not have to go through a long special permit process. Two main disadvantages exist with this approach: the prescriptive code could stifle design creativity; and it is unclear if the town has sufficient administrative resources to develop and implement a form-based overlay.

CANDIDATE 4: Floating Formed-based Zoning

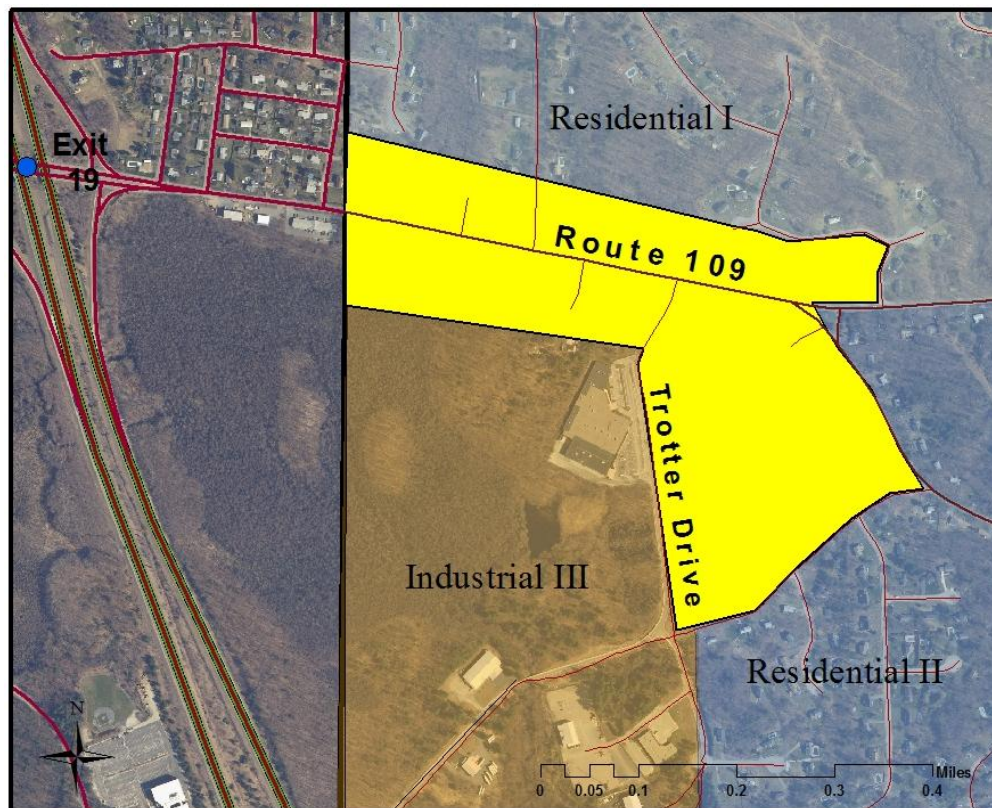
This approach would allow development conforming to a form-based code as described above, but in the nature of a floating zone. A floating zone proscribes permitted uses, setback requirements, and other standards in the same manner as a conventional zoning district, but it is not geographically delineated on the town's zoning map. A developer or property owner would invoke the provisions of the floating zoning code by initiating a rezoning process, which requires Planning Board hearings and a two-thirds vote of Town Meeting. When a planning board approves a development application that meets the criteria outlined in the floating zone, the zone becomes affixed to those acres or that parcel. The advantage of this approach is that the provisions could be enacted anywhere in town that meets the minimum requirements

of the code. There could be a minimum lot size, for example, that would limit such re-zonings to desired parcels. Besides the two disadvantages listed above, a form-based floating zone could become problematic if it is invoked too frequently, causing the Town's zoning to become further parceled and making it ever more difficult to administer.⁴

5.5. Recommended Regulatory Approaches

Analysis of the above regulatory approaches indicates that the geographic area in which the objectives are desired includes the Route 109 gateway and the residential portion of the project site. The following overlay boundaries are recommended: 500 feet either side of Route 109 from the town line at the west to West Street, and the residential area bounded by Trotter Drive and West and Alder Streets. The proposed district would be geographically delineated on the Town zoning map as shown below:

Table 13: Proposed overlay district boundaries



Source: MassGIS

RECOMMENDATION 1: Mixed-use Overlay District

This approach would allow the underlying base Industrial IV and Agricultural/Residential II zones to remain while offering developers an opportunity to achieve Traditional Neighborhood Density by opting

⁴ Glenn Garber, UMass LARP faculty member, interview April 18, 2007

Medway Design Recommendations

to build a project similar to that suggested by Oak Grove Village under provisions of a new mixed-use overlay district.

This approach would appeal to existing property owners within the proposed district, as it would protect the currently allowed uses (through the existing base zoning) and property interests. Community outreach found significant concern among town officials and industrial property owners for protecting their existing regulatory arrangements. In addition, the town is already familiar with the concept of a mixed-use overlay, having adopted the Adaptive Use Overlay District for West Medway village center in 2004. Therefore, a mixed-use overlay could be more administratively and politically feasible than other approaches. Key principles of Recommendation 1 are summarized in Figure 10.

Table 14: Summary of regulatory Recommendation 1

Mixed-use Overlay District	
Uses Allowed By-right (base zoning)	<ul style="list-style-type: none"> Residential, commercial, retail (uses already allowed by-right in Ag/Res II or Industrial IV districts)
Uses by Special Permit	<ul style="list-style-type: none"> Residential: Apartments, Condominiums Commercial: Retail store, offices for business or professional use, restaurant, café, hotel, conference center, bank, shopping center, personal care services (i.e., beauty parlor, barbershop, nail salons), florist, convenience store Transportation and joint development related Day care center, health club and similar
Bulk requirements	
Height	<ul style="list-style-type: none"> 2-story minimum for retail/commercial 3-story maximum for retail/commercial
Building footprints	<ul style="list-style-type: none"> 5,000 square foot minimum retail/commercial 25,000 square foot maximum for retail/commercial
Materials	<ul style="list-style-type: none"> Permeable surfaces for parking and sidewalks Permeable road surfaces if possible
Density bonuses	<ul style="list-style-type: none"> \$3,000 per affordable unit in residential \$5,000 per unit in retail/commercial structure
Separate dimensional and intensity standards for mixed-use structures and residential structures	<ul style="list-style-type: none"> More units per structure ratio allowed in mixed-use buildings All structures with commercial uses on the ground floor must contain residences or offices above Setback requirements reduced for structures with commercial use on

Density through Design: Volume I

	<p>ground floor</p> <ul style="list-style-type: none"> Limit 25% of all parking intended to serve commercial uses located in front of structures with the majority in the rear
Parking	<ul style="list-style-type: none"> Reduced parking requirements from currently required in Commercial and Industrial zones Allow shared parking (residential in evenings; commercial during the day) to reduce parking need
Sustainability	<ul style="list-style-type: none"> Incorporation of US Green Building Council Leadership in Environmental and Energy Design (LEED) building and neighborhood standards
Amenities	
Transit service	<ul style="list-style-type: none"> On-site shuttle stop encouraged with service to Franklin I-495 MBTA Commuter Rail station timed to arrive for each train departure/arrival Parking for 50% of shuttle users
Recreational amenities	<ul style="list-style-type: none"> Walking trails Accessible park and playground facilities open to all town residents
Landscaping	<ul style="list-style-type: none"> Plantings to achieve/restore existing vegetation density Spatial and vegetation buffers to industrial uses Vegetation buffers between residential-only and mixed-use structures
Subdivision requirements	
Water	<ul style="list-style-type: none"> No more than 5% total impervious surfaces On-site groundwater recharge Full compliance with NPDES Phase II Stormwater swales Rain gardens
Pedestrian facilities	<ul style="list-style-type: none"> Sidewalks to all structures Minimum sidewalk widths of 6 feet Raised pavement crosswalks, solar-powered user-activated crossing lights
Open space	<ul style="list-style-type: none"> 35% minimum (combined public and private)

RECOMMENDATION 2: Form-based Overlay

A form-based overlay district would offer the town greater control over design outcomes. However, implementing a form-based code would involve significant public participation in the development of building and subdivision standards, thereby necessitating greater administrative involvement of municipal

paid staff. However, the end result is a product may be more aesthetically pleasing and better integrated into the surrounding community.

Form-based zoning places greater emphasis on the form of structures and their contextual relationship to the street, rather than the uses contained within the buildings. Except for uses already prohibited in the base zoning districts, all uses would be allowed by-right. Form-based zoning typically entails architectural specifications relating to style, detail, height, and massing.

A form-based approach could provide better control in achieving the desired western community gateway along Route 109 on the northern boundary of the site. Medway's Design Review Committee would play a key role in the development and administration of a form-based zoning overlay, with final approval by the Planning Board and, ultimately, Town Meeting. When a development meets the provisions specified in the code, the use is allowed by-right. Developers should find the mixed-use overlay attractive because of the increased density that would be allowed (apartments above retail). The overlay would allow uses, which the Massachusetts Alliance for Economic Development identified as amenities to industrial and business parks, to complement the future build-out of the industrial park. Flexibility of use will also prove to be more marketable to developers, which, in turn, should benefit the town's tax base.

The following are methods to guide the Planning Board and Design Review Committee in achieving the outlined objectives for the site with a form-based code. The town may wish to consider other form-based provisions, as well.

Table 15: Summary of Regulatory Recommendation 2

Form-based Standards Overlay District	
Allowed Uses By-right with site plan review	<ul style="list-style-type: none"> • All uses allowed by right in the base Ag/Res II or Industrial IV districts • Residential: Apartments, Condominiums • Commercial: Retail store, offices for business or professional use, restaurant, café, hotel, conference center, bank, shopping center, personal care services (i.e., beauty parlor, barbershop, nail salons), florist, convenience store. • Transportation joint development related • Day care center, health club and similar
Allowed by Special Permit	No special permit would be required
Bulk Requirements	
Dwelling units per acre - mixed-	15 – 20

Density through Design: Volume I

use structures	
Dwelling units per acre - residential structures	8 – 12
Dwelling units per structure for mixed-use buildings	2 - 6
Dwelling units per structure for residential buildings	1 – 5
Sidewalk width	10 ft
Street width	24 ft
Parking per residential unit	1.5 spaces per unit
Parking per square feet of commercial space	1 space per 200 sq ft
Setbacks for mixed-use structures	
Front	0 ft
Side	0 ft
Rear	0 ft
Setbacks for residential from public way	
Front	30 ft
Side	15 ft
Rear	15 ft
Setbacks for residential from private way or parking lot	
Front	0 to 30 ft
Side	0 to 15 ft
Rear	0 to 15 ft
Building footprint for mixed-use bldgs (as % of buildable area)	30%
Building footprint for residential bldgs (as % of buildable area)	60%
Distance between mixed-use structures	0 to 25 ft
Distance between residential structures	1 to 25 ft
Floor area per commercial unit	1,000 to 20,000 sq ft

Medway Design Recommendations

Floor area per residential unit	600 to 1,200 sq ft
Architectural Standards	
Windows	To be decided by community
Entrys	”
Porches	”
Roofs	”
Arcades	”
Facades	”
Materials	”
Width	”
Types	”
Styles	”
Landscape Standards	
Trees	”
Shrubs	”
Planters	”

5.6. Evaluation of Recommendations

The following table provides a summary evaluation of Recommendations 1 and 2 with respect to the established goals and existing zoning.

Table 16: Evaluation of Recommendations 1 and 2

Criteria	Existing Zoning	Recommendation 1 Mixed-used	Recommendation 2 Form-based
Achieves Work Force Housing/Traditional Neighborhood Density of 12-15 du/ac	NO	YES	YES
Discourages single-family detached dwellings	NO	YES	YES
Maximizes 1-2 bedroom units to minimize school costs	NO	YES	YES
Transit access	NO	YES	YES
Maximizes underutilized infrastructure	NO	YES	YES
Allows Medway to achieve Ch. 40B affordable housing 10% goal	NO	YES	YES
Creates a mix of housing types	NO	YES	YES
Requires 30% open space	NO	YES	YES
Includes trails, other recreation facilities	NO	YES	YES
Highly specific control over building appearance, setbacks and landscaping	NO	NO	YES
Predictable subdivision design	NO	?	YES
Sustainability, low-impact development (LID) stormwater	NO	?	YES
Controlled setbacks, building appearance, landscaping	NO	?	YES
Individual design creativity	?	?	NO
Administrative/cost feasibility	<input type="checkbox"/> YES	YES	NO
Legislative/political feasibility	<input type="checkbox"/> YES	YES	?

Many of the original goals of the regulatory analysis are satisfied by both the mixed-use and form-based overlays. Differences emerge in areas controlled by subdivision regulations, administrative level of effort and political feasibility. A form-based code offers more control, but may also limit the creativity of future design efforts. Therefore, further analysis of both recommendations is necessary before a preferred approach can be adopted.

6. COMMUNITY ENGAGEMENT and IMPLEMENTATION

This chapter offers suggestions for continuing the community engagement process initiated by this UMass studio project and implementing the Oak Grove Village site proposal described in Chapter 4 and the regulatory recommendations in Chapter 5.

The suggested community engagement process and implementation plan involves stakeholders at the municipal, regional and state levels. At the municipal level, one of the key challenges will be obtaining town approval to create an overlay district to allow greater residential density and complementary mixed uses. Therefore, many of the recommendations in this chapter focus on raising community awareness of workforce housing needs and building coalitions to achieve a successful two-thirds rezoning vote at a future Medway Town Meeting.

At the regional level, the Partnership and its members have an opportunity to play a central role in advancing new ideas and solutions to the workforce housing crisis. State level involvement will also be valuable to engage agencies and elected officials in the programs, especially Chapter 40R and 40S, which are central to the success of the proposed site design and regulatory revisions.

6.1. Community Engagement to Date

Since it began in late January 2007, the UMass studio process has included the participation of Medway elected officials, administrators and residents, the Partnership's Studio Review Committee members and developers from the region. The insight and information offered by these participants has been essential to the success of the studio. Therefore, it is recommended that these stakeholders form the nucleus for the next phase of the community engagement process to help promote the site proposal and discussion of regulatory recommendations. See the Appendix for a summary of community engagement to date, including primary concerns revealed by stakeholders in interviews and feedback from stakeholders at four meetings in April and May 2007 where studio members presented interim and final recommendations.

6.2. Recommended Participatory Process Moving Forward

Perspective on the Process

The involvement of Design Review and community members in the studio process has helped the UMass Studio team create a design proposal (Oak Grove Village) with the potential to address many of the stakeholder needs and concerns identified during the research and public involvement phases of the studio project. The proposal and accompanying regulatory recommendations offer a sustainable design that

maximizes the new sewer infrastructure to be built by the town; it offers significant incentives for developers in the form of density bonuses and mixed use tenant flexibility; it creates substantially more open space and recreational amenities than could be expected or required under existing zoning; and it creates pedestrian and transit connectivity where none would otherwise exist. Perhaps most importantly, the design proposal and recommendations would provide affordable, convenient and attractive housing for in the \$250,000-\$300,000 per unit price range, which is essential to meet the future needs of Medway residents.

The upcoming community process will provide new forums for the expression and consideration of stakeholder interests. This process will be based on four principles:

- Collaboration;
- An outward focus that helps place the project in the context of the surrounding neighborhood;
- A focus on addressing the housing, commercial, open space and recreational needs of the Medway community at large; and
- Achieving a sustainable, ecologically friendly, economically viable, and socially acceptable final development (Khede 2002).

The implementation of a workforce housing development on the Oak Grove Bottle Cap Lots site will require engaged stakeholders at all levels. Participants must be willing to explore nontraditional ideas about site design, zoning regulations and the role of regional and state entities in housing production. All must be willing to be candid and positive in their approach to the issue of work force housing—from the broadest policy levels down to the words and language they use to debate and evaluate solutions.

6.3. Engaging Stakeholders in the Promotion of Denser Residential Development

The Studio team has identified four broad categories of stakeholders and subgroups. Recommendations for engaging these actors are described below. At the municipal level the main goal of engagement is to develop the Oak Grove Bottle Cap Lots site in accordance with the recommendations in this report and will involve partnerships at the regional, state and corporate/institutional levels. Concurrently, recommended activities at the state level, such as removing regulatory barriers to denser residential development and increasing funding for programs such as 40R and 40S would better facilitate the development of workforce housing not only in Medway, but throughout the state.

Municipal

The municipal outreach process will be the central focus of the community engagement process. Indeed, Medway's elected officials, board members and Town Hall administrators have been working with success to improve housing opportunities for many years. Their recent adoption of an adaptive use overlay district and Chapter 43D expedited permitting provisions, as well as ongoing work to create a Traditional Neighborhood District overlay zone under a Smart Growth grant received from the Commonwealth of Massachusetts in 2006 are evidence of the community's forward-looking approach.

The municipal community process for the workforce housing initiative may build on the Town's success to date. Including a broad range of municipal stakeholders will help insure the success of subsequent public engagement.

This report suggests the Town of Medway consider appointing a Working Group to serve as the focus of community engagement and implementation process. Groups of this nature are typically most effective when they are limited to 12-20 members. The Working Group would be responsible for developing and carrying out a Work Plan that would lead the Town toward the expressed goal of issuing a Request for Proposals for the Bottle Cap Lots site. The Work Plan would include broad goals, specific objectives, a list of participants, and a schedule of meetings and milestone dates.

The participation of the following municipal stakeholders should be considered:

<u>Boards and Committees</u>	<u>Town Administration</u>	<u>Community Groups,</u> <u>Employers and Institutions</u>
Select Board	Planning Board Administrator	Abutters and owners of
Planning Board	Town Clerk	involved parcels
Conservation Commission	Building Commissioner	United Chamber of
Board of Health	Conservation Agent	Commerce
Finance Committee	Police and Fire Chiefs	Realtors
Industrial Committee	School Superintendent	Citizens group(s)
Design Review Committee	Public Works Director	
Water and Sewer Commission	Tree Warden	

Regional

The engagement of regional stakeholders will enhance the workforce housing initiative, as many other communities in Greater Boston are facing similar challenges to those of Medway. Indeed, the Oak Grove

Village site proposal and regulatory recommendations may provide a resource to other communities in the 495 Corridor that are grappling with similar concerns.

The Arc of Innovation 495/MetroWest Partnership is an established stakeholder on this issue. The continued involvement of the organization, including the Studio Review Committee, its 32 member communities and corporate members is vital to upcoming efforts. The Partnership may wish to utilize its standing Housing and Design Review Committees as the focus of regular meetings with other regional stakeholders and agencies that are active in the workforce housing. These may include the Metropolitan Area Planning Commission, Chambers of Commerce and Business Associations in MetroWest, and housing advocacy organizations, such as the Massachusetts Housing Partnership and the Citizens Housing and Planning Association. Finally, the Massachusetts Chapter of the American Planning Association may be an important resource in the regional engagement effort, as well as the state-level effort described below.

State

Chapter 5 identifies many state-level regulations that may affect the success of the workforce housing initiative, as well as opportunities to update these regulations to broaden the number of sites throughout Massachusetts, particularly in suburban communities like Medway that may have sites where desirable residential densities could be achieved. State level activities would dovetail closely with the regional engagement program suggested above. The involvement of the following agencies should be considered:

- Massachusetts Department of Housing and Community Development
- Massachusetts Department of Economic Development and Energy
- Joint Committee on Housing of the Massachusetts Legislature
- Massachusetts Water Resources Authority
- Massachusetts Bay Transportation Authority
- MassHighway

Corporate/Institutional

One of the central issues that the UMass Studio sought to address for the Partnership is the lack of housing for employees of biotech and other growing industries that wish to locate in I-495 corridor. Interviews with respondents identified the shortage of affordable housing for entry-level and young professionals as a central impediment to the region's ability to attract growing firms. Furthermore, the research phase of the studio identified corporate support as a key ingredient to successful developments of

Medway Design Recommendations

higher density housing. Listed below are a range of corporate and institutional stakeholders that the Partnership may wish to include in upcoming phases of the project.

Cybox, other major local employers
 Regional hospitals and health care providers
 Regional academic institutions
 Real estate development firms
 Financial institutions
 Hotel and hospitality operators

Table 17: Regulatory Implementation Recommendations

MUNICIPAL STRATEGIES		RESPONSIBILITY	TIMEFRAME*	PRIORITY
1	Designate Working Group	Select Board	Immediate	High
2	Draft Work Plan	Working Group	Short term	High
3	Workshops and briefings for all elected officials and town boards.	Working Group	Short term	High
4	Presentations to Planning Board and/or ZBA meetings/hearings.	Working Group	Short term	Medium
5	General public outreach via newspapers, Town newsletter and website.	Working Group, Planning Board	Ongoing	High
6	Preparation for Town Meeting vote(s).	Working Group, Planning Board	Middle term	High
7	Town Meeting vote	Planning Board, Design Review	Middle term	High
8	Prepare and issue Request for Proposals	Working Group, Select Board	Long term	High

REGIONAL STRATEGIES		RESPONSIBILITY	TIMEFRAME	PRIORITY
1	Arc of Innovation/495 Partnership briefings	Arc of Innovation	Short term	Medium
2	Regional agency coordination and partnership	Arc of Innovation	Immediate	High
3	Outreach to nonprofit housing agencies	Arc of Innovation	Short term	High
STATE-LEVEL STRATEGIES		RESPONSIBILITY	TIMEFRAME	PRIORITY

Density through Design: Volume I

1	Briefings for elected officials of the Arc/495 region	Arc of Innovation	Short term	Medium
2	Testimony or presentation to Legislative Joint Committee on Housing	Arc of Innovation	Short term	High
3	Presentation to Mass. Dept. of Housing and Community Development	Arc of Innovation	Short term	High

CORPORATE / INSTITUTIONAL STRATEGIES		RESPONSIBILITY	TIMEFRAME	PRIORITY
1	Outreach to Cybex, local employers	Project Manager	Immediate	High
2	Briefings and working sessions with Arc of Innovation corporate members	Arc of Innovation	Short term	Medium
3	Coordination with Biotech industry professional association(s), other tech sector firms	Arc of Innovation	Short term	Medium
4	Meeting with Milford Regional Hospital, other regional institutions	Planning Board	Short term	High

**Timeframe: Immediate-6 Months; Short term-1 year; Middle term-2 years; Long term-5 years*

6.4. Recommended Outreach Products and Messages

Implementation will require an array of products to support outreach efforts described above. The following products are recommended:

1. Visualizations
 - Site plans and perspectives to show site buildout allowed under existing zoning (the worst case scenario).
 - Site plans, perspectives, computer generated photo composites of the site proposal as allowed under the recommended regulation revisions. The Town of Medway will be provided with electronic copies of the images in Chapter 4 Site Design.
2. Brochure that can be mailed or handed out at meetings
3. Website (as part of Town website)

- Frequent updates to encourage repeat visits.
 - Content to include news, upcoming meetings, maps, visualizations, other links.
4. Press releases, magazine articles, opinion pieces
 5. PowerPoint show
 6. Workshop agenda

Throughout the development of these products, messages should be clear and consistent. The following recommendations and talking points may be used as a guide for the content of these products.

- ☐ Use the term ‘Traditional Neighborhood Density’, rather than ‘high density.’ (See Studio Report “Community Factors Driving Opposition to Density” of March 8, 2007).
- ☐ Address residents’ concerns, such as school costs. Reference the Community Opposition to Density research report for responses to typical concerns and tips on mitigating those issues.
- ☐ Focus on the benefits of the plan:
 - This project is necessary to make the most efficient use of a planned sewer extension, which is essential for retaining Cybex, Medway’s largest employer, and inviting new industrial tenants.
 - Efforts were made to preserve the existing industrial parcels.
 - The plan provides publicly accessible open space.
 - Smaller, more affordable housing will make it easier for retirees and 18-35 year-olds to stay in town.
 - Mixed-use development will help to balance Medway’s tax base. Inform residents who are concerned with changes to the look of Route 109 of the importance of visibility to the success of those businesses.
 - At a regional scale, environmental priorities include preserving critical resources such as farmland and large continuous blocks of forest. This can only be achieved by reducing development pressure on those areas. Traditional neighborhood design is an important part of that regional strategy.
- ☐ Highlight the consequences of inaction:
 - Important community members such as firefighters, nurses, utility workers and others might find themselves needing to move out of town to find housing that they can afford.
 - Without this project, Medway will continue to be short of meeting its 10 percent affordable housing goal, and therefore vulnerable to a 40B development that is not subject to zoning.

6.5. Utilizing the Request for Proposal (RFP) as an Opportunity

As the project design and vision develops, stakeholders will express interests that they would like to see incorporated into the site. Officials should maximize the opportunity to influence the process and products of development as identified by stakeholders by specifying these items in the Request for Proposal:

- Maintenance of community open space should be borne by the developer and the condo or homeowner association.
- The developer should be required to provide the Town with visualization products that can be used to gain public support.
- Require impact fees and/or specific infrastructure upgrades to address the impacts of the new development.
- Amenities such as parks and playgrounds, public drinking fountains and benches should be required.
- De-emphasizing the view of parking lots from the street is desirable, however, it necessitates adequate signage.
- Providing a safe environment with appropriate landscaping and lighting plans is essential.

6.6. A Vision for the Future

Massachusetts is facing a pressing land use problem. A startling report issued by the Mass Audubon in 2003, titled: *Losing Ground: At What Cost?* draws attention to the loss of land in the entire state. In particular, loss of agricultural land to development is distributed throughout the I-495 region and the Connecticut River valley. Between 1985 and 1999 the state continued to lose 40 acres per day to “visible” development (as interpreted from aerial photography). Nine out of ten acres were used for residential development, while 65 percent of this land was used for low-density, large-lot housing. Statewide since 1970, average residential building lot sizes have increased 47 percent (Mass Audubon 2003).

In the next fifty years, communities in Massachusetts will face demands that engender the increased urbanization of suburbs and the increased suburbanization of rural areas. As land becomes scarcer, developing at low densities will be increasingly impractical. Building at greater densities is the best strategy for accommodating people while reducing development pressure on farms and forests. Besides the intrinsic value of natural areas, the ecosystem services that they provide are simply too valuable to squander. Additionally, Towns that attempt to maintain their community character by enforcing primarily large, single-family homes will likely face deficit financing, as Medway is experiencing. Failure to build a

variety of housing types will exclude the groups of people that give communities a diversity of interests, experiences, and human and labor capital.

The Oak Grove Village site proposal, market analysis and regulatory recommendations offer several important lessons:

- Mixed-use development has the potential to balance the tax base in towns that have a high proportion of residential uses.
- Mixed-use developments with built-in flexibility for different uses may be more successful in the face of market fluctuations.
- Mixed-use developments are consistent with state Smart Growth and sustainability goals.
- Higher density housing decreases excessive land consumption.
- Work force housing ensures that people of all income levels are afforded decent housing.

The State of Massachusetts has taken innovative actions in attempts to achieve smarter land use and address the economic and social issues resulting from the high cost of living in the state. Nevertheless, programs such as 40R and 40S need increased funding to encourage towns to seek participation when prime sites become available for development. The Arc of Innovation may be able to play a crucial role in encouraging the state to look for sources of money to provide funding for these programs so that towns can maximize their potential benefit. The Arc of Innovation may also encourage the State to reevaluate requirements for 40R eligibility to make sure that they are not too inflexible to address all of the types of sites that would be appropriate for a Smart Growth District. For instance, the minimum density requirement may need to be revised to include a range of appropriate densities depending on a rural, suburban or urban context.

The Arc of Innovation may also be able to promote solutions to Massachusetts' land use problems by vocally supporting state level zoning reform legislation. The proposed Massachusetts Community Planning Act II (CPA II) reforms in the areas of plan/regulatory consistency, grandfathering, approval not required plans (ANRs), the two-thirds Town Meeting zoning vote, affordable housing, and impact fees (APA Massachusetts Chapter 2005). Many of the proposed changes in the CPA II will better facilitate sustainable, workforce housing throughout the State.

Statewide problems are manifested at the local level. To resolve these issues, towns require the support provided by entities such as regional planning agencies and the Arc of Innovation. Many towns in the state lack the resources to be able to address growth issues, and collaboration with these entities would ensure long-term growth management. In every region of the State there are at least a few organizations that can offer land use expertise. Smarter land use cannot be achieved overnight; nonetheless, it is

achievable through determination and a consensus that smarter decisions today will yield better outcomes in the future.

7. REFERENCES

- 495/MetroWest Corridor Partnership. (2007)“Arc Update.” (Jan/Feb 2007) <www.arc-of-innovation.org/ARC_Update_January_February_07.pdf> accessed_11-Feb-2007.
- 495/MetroWest Corridor Partnership. (2007) Website. <www.arc-of-innovation.org/index.html> accessed 11-Feb-2007.
- American Farmland Trust. (2002)Fact Sheet: Cost of Community Service Studies. Washington DC. <www.farmlandinfo.org/documents/27757/FS_COCS_11-02.pdf>.
- American Planning Association. (2004)A Planner’s Dictionary. Ed. Michael Davidson and Faye Dolnick. Chicago.
- Barnett, Jonathan. (2004) Codifying New Urbanism. American Planning Association. Chicago.
- Bluestone, Barry and Bonnie Heudorfer. (2006) The Greater Boston Housing Report Card 2005-2006: An Assessment of Progress on Housing in the Greater Boston Area. Northeastern University: The Center for Urban and Regional Planning (CURP). www.curp.neu.edu/pdfs/HRC%202005-2006.pdf.
- Bluestone, Barry, Rusell B. Stearns, and Andre B. Streans. (2006) Sustaining the Mass Economy: Housing Cost, Population Dynamics, and Employment. Northeastern University Center for Urban & Regional Policy. <www.curp.neu.edu/pdfs/Rev1.Draft%20Report1.052006.pdf> accessed 2-Feb-2007.
- Bobrowski, Mark. (2002) Handbook of Massachusetts Land Use and Planning Law. Second Edition. Aspen Law & Business. Boston.
- Breunig, Kevin. (2003) Losing Ground: At What Cost? Mass Audubon. Downloaded from www.massaudubon.org/losingground April 27, 2007.

- Burchell, Robert W. (2007) Sprawl Costs: Economic Impacts of Unchecked Development. Washington, D.C.: Island Press. <www.loc.gov/catdir/toc/ecip054/2004029253.html> accessed 12-April-2007.
- Bureau of Labor Statistics. (2007) Metropolitan Area Occupational Employment Wage Estimates, Framingham NECTA Division. <www.bls.gov/oes/current/oes_73104.htm> accessed 13-March-2007.
- Center for Policy Research. (2006) Residential Demographic Multipliers- Estimate of Occupant New Housing. New Brunswick, New Jersey: Rutgers University. <www.dataplace.org/pdfs/MASSACHUSETTS%20multipliers.pdf> accessed 1-April-2007.
- Center for Urban Regional Policy (2005). Chapter 40R School Cost and Proposed Smart Growth School Cost Insurance Supplement. Boston, MA: Northeastern University. <www.curp.neu.edu/pdfs/SchoolsHousingFINALrev.pdf>.
- Churchman, Arza. (1999) "Disentangling the Concept of Density." *Journal of Planning Literature* 13:4.
- Citizens Housing and Planning Association. (2006) "Fact Sheet on Chapter 40B: The State's Affordable Housing Zoning Law." <www.mhp.net/uploads/resources/chapter_40b_qa.pdf> accessed 12-April-2007.
- Department of Housing and Community Development (2002). "Town of Medway, Community Profile." <www.mass.gov/dhcd/iprofile/177.pdf> accessed 20-Feb-2007.
- Department of Workforce Development. "Labor and Workforce Development: Employment and Wages (ES-202)." <lmi2.detma.org/lmi/lmi_es_a.asp> accessed 1-April-2007.
- ForeclosureMass.com. "Medway, MA (Norfolk County)." <www.foreclosuresmass.com/about/town_medway.html> accessed 1-April-2007.
- Garber, Glenn. (2007) UMass Landscape Architecture and Regional Planning faculty. Remarks to UMass Studio class. 18-April-2007.

- Ginnie Mae Foundation. Homeownership and Guide Calculators. <www.ginniemae.gov/2_prequal/intro_questions.asp?Section=YPTH> accessed 13-March-2007.
- Goodman, Michael D. and James Palma. (2004) *Winners and Losers in the Massachusetts Housing Market: Recent Changes in Demand, Supply and Affordability*. Boston: Citizens Housing and Planning Association. <www.chapa.org/pdf/WinnersandLosers.pdf> accessed 20-Feb-2007.
- Hill, Daniel C. (2005) "Municipalities Becoming More Savvy on Chapter 40B Issues," Banker and Tradesman Online. (January 10, 2005). <www.andersonkreiger.com/pdf_articles/Chapter_40B> accessed 12 April 2007.
- Hoag, Grace. (2007) Medway Historical Commission. Interview with Jayne Bernhard. 28-Feb-2007.
- Hoffman, Bill. (2007) "Visual History of Medway." Medway Town Library Website. <medwaylib.org/History.htm> accessed 25-Feb-2007.
- Joint Center for Housing Studies. (2006) The State of the Nation's Housing 2006. Cambridge, MA. <www.jchs.harvard.edu/publications/markets/son2006/son2006.pdf>.
- Kehde, Karl. (2002) "Smarter Land Use: How to Enhance Proposed Projects to Get Better Neighborhoods, Less Sprawl, and Fewer Lawsuits." LUFNET, Northampton, MA.
- Massachusetts Bay Transportation Authority. (2007) Forge Park/Route 495 Station. <www.mbta.com/schedules_and_maps/rail/lines/stations/?stopId=67> accessed 8-March-2007.
- Massachusetts Department of Housing and Community Development. (2005) "Chapter 40B Subsidized Housing Inventory." <www.mass.gov/dhcd/components/SCP/shiinv.htm> accessed 28-April-2007.
- Massachusetts Department of Workforce Development. "Labor and Workforce Development: Employment and Wages (ES-202)." <lmi2.detma.org/lmi/lmi_es_a.asp> accessed 1-April-2007.
- Massachusetts Environmental Protection Act. "About MEPA." <www.mass.gov/envir/mepa/secondlevelpages/aboutmepa.htm> accessed 17-April-2007.

Massachusetts Geographic Information System. <www.mass.gov/mgis/massgis.htm> accessed 24-April-2007.

Massachusetts Historical Commission. "Review and Compliance." <www.sec.state.ma.us/mhc/mhcrevcom/revcomidx.htm> accessed 17 April 2007.

Massachusetts Institute for Social and Economic Research (2004). "MISER Population Projections." <www.umass.edu/miser/population/miserproj.html> accessed 1-April-2007.

Massachusetts Smart Growth Alliance. <www.ma-smartgrowth.org> accessed 15-Feb-2007.

McCall-Vernaglia, Betty. (2007) "Market Conditions Summary for Medway, Massachusetts." Realty Times. <realtytimes.com/rtmcrlc/Massachusetts~Medway> accessed 1-April-2007.

Medway Public Schools. "FY 2008 Working Draft Budget." Medway, MA. <www.medwayschools.org/cgiscript/csNews/news_upload/Medway_20Schools_2edb.fy2008_budget.pdf> accessed 1-April-2007.

Metropolitan Area Planning Council. (2006) "Mixed Use Zoning: A Citizens' Guide Supplement." <www.mapc.org/whats_new/Regional_Record/May2006/Mixed_Use_Toolkit/Mixed_Use_Citizens_Guide.pdf> accessed 20-April-2007.

Metropolitan Area Planning Council. (2006) Mixed Use Zoning: A Planners Guide. <www.mapc.org/whats_new/Regional_Record/May2006/Mixed_Use_Toolkit/Mixed_Use_Planners_Toolkit.pdf> accessed 12-April-2007.

Metropolitan Area Planning Council. (2006) Our Changing Economy: MetroFuture Projections Brief #2. Boston. <www.mapc.org/data_gis/data_center/2006_Projections/Changing_Economy.pdf> accessed 1-April-2007.

MIT Center for Real Estate. (2006) "Housing Affordability Initiative-Land use Research Findings." <web.mit.edu/cre/research/hai/land-use.html> accessed 1-March-2007.

MSL Online. (2007) "Real Estate & MLS Listings: Medway, Massachusetts." <www.mlsonline.com/user/user_territory.php?location=3461> accessed 1-April-2007.

Rick, Diamond. (1995) "Energy Savings Rise High in Multifamily Buildings." Home Energy Magazine Online. September/October 1995. <www.homeenergy.org/archive/hem.dis.anl.gov/eehem/95/950908.html> accessed 5-Oct-2006.

Massachusetts Institute for Social and Economic Research (2006). "MISER Population Projections." <www.umass.edu/miser/population/miserproj.html> accessed 1-April-2007.

Town Of Medway. (2005) "Buildout Permits per Year." <www.townofmedway.org> accessed 17-March-2005.

Town of Milford. (2002) "Milford Massachusetts Community Profile." <www.milford.ma.us/profile.htm> accessed 12-April-2007.

University of Massachusetts Landscape Architecture and Regional Planning Studio Mid-Semester Reports, "Density Through Design", 8-March-2007.

U.S. Census Bureau. (2000) "Census 2000 (Summary Profile 3)." <www.census.gov/Press-Release/www/2002/sumfile3.html> accessed 29-April-2007.

U.S. Census Bureau. 2000 Census. "Means of Transportation to Work." <www.census.gov> accessed 8-March-2007.

Warren Group. (2007) Town Statistics: Median Sales Price per Calendar Year, Medway, MA. <rers.thewarrengroup.com/townstats/search.asp> accessed 13-March-2007.

Warren Group. (2007) Town Statistics: Median Sales Price per Calendar Year, Medway, MA. <rers.thewarrengroup.com/townstats/search.asp> accessed 13-March 2007.

Wright, William. (2007) Medway Industrial Development Committee. Phone interview with Jayne Bernhard. 28-February-2007.

Municipal Documents Referenced

Town of Bellingham, Zoning Bylaw and Map, October 2006.

Town of Franklin, Zoning Bylaw and Map, January 2005.

Town of Holliston, Zoning Bylaw and Map, May 2006.

Town of Hopkinton, Zoning Bylaw and Map, May 2005.

Town of Medway Massachusetts, Master Plan, May 1999.

Town of Medway, Zoning and Subdivision Bylaws and Map, February 2006.

Town of Milford, Zoning Bylaw, October 2004.

Appendix A

Stakeholder Interviews

Interviews were conducted with more than a dozen Medway officials, the Partnership's Studio Review Committee members, real estate experts and other professionals (See research report on Community Opposition to Density for list of interviewees and interview summaries). These key informants suggested that a successful workforce housing program should address the following primary concerns:

- ☐ Higher taxes for increased municipal services;
- ☐ School costs from new pupils and the potential/perceived costs to local schools;
- ☐ Lack of municipal authority to charge school-related impact fees;
- ☐ Lack of confidence that Chapter 40R and 40S will provide assistance;
- ☐ Fast rate of residential growth;
- ☐ Traffic and parking;
- ☐ Strong desire to maintain local control of aesthetics and existing zoning bylaws;
- ☐ General opposition to any project with a density greater than 1 du/ac;
- ☐ Poor quality design and/or construction of existing denser housing developments;
- ☐ Additional costs for water and/or sewer hook ups;
- ☐ Resistance to mixed use zones from residents and commercial landlords;
- ☐ Lack of understanding of "traditional" housing densities; and
- ☐ Lack of predictability in the permitting process.

Meetings, Presentations and Feedback

Studio team members met several times with stakeholders to receive feedback on preliminary design and regulatory approaches. On April 4, 2007, the studio team presented two design concepts to the Partnership's Design Review Committee, which offered the following feedback:

- ☐ Preference for maximizing industrial uses and reducing commercial office space;
- ☐ Eliminate or reduce single-family detached homes in favor of townhouse-style apartments and multiplexes
- ☐ Consider impact of Milford retail and industrial zones nearby;
- ☐ Gear future retail toward the future residents of the new development, employees of Cybex and potential new nearby industrial tenants; and
- ☐ Design and regulatory scheme should accommodate such possible future retail/commercial tenants as dry cleaners, day care, gym, small grocery store and restaurants.

On April 11, 2007, the studio team presented revised design concepts to officials and residents of Medway, Studio Review Committee members and several residential developers. This group provided the following feedback:

- The success of hotel or commercial establishments depends on visibility from the highway and roadway (Route I-495 and Route 109);
- Housing affordability could be improved by designing higher density apartment buildings of 24-48 units each (rather than townhouses), building smaller units, building close to infrastructure and avoiding boulder outcrops on the site;
- Pre-fabricated construction may reduce costs and still yield desired quality; and
- Retail sites of 20,000-30,000 square feet may be more marketable and attract larger stores and restaurants than “mom n’ pop” establishments.

Studio members presented final designs and regulatory recommendations to UMass Landscape Architecture and Regional Planning faculty on May 9 and to the Arc of Innovation Design Review Committee on May 11 and received the following comments:

- The residential scheme is well-designed and has an appropriate density for the site;
- The mixed-use gateway along Route 109 is a good strategy for achieving the fiscal balance sought by the town;
- The hotel/conference center concept should be developed further;
- Parcel ownership will need to be considered going forward;
- In addition to the two overlay districts considered, the regulatory recommendations might have also benefited from examining a new base district in greater detail: and
- The visualizations prepared for the site proposal will be valuable to the forthcoming public involvement process.

Appendix B

Table 18: Housing types, units and lot sizes for Boston Metro and subregions

Location	Type	Units	Median Lot Size/ Land per Unit
Boston Metro Area	Single Family	30,387	0.91 acres
	Multi-family	14,362	0.13 acres
	Apartments	5,047	0.06 acres
	Condominiums	9,315	0.19 acres
Inside Route 128	Single Family	2,707	0.28 acres
	Multi-family	5,157	0.05 acres
	Apartments	2,323	0.03 acres
	Condominiums	2,834	0.06 acres
Outside Route 128	Single Family	27,680	0.92 acres
	Multi-family	9,205	0.21 acres
	Apartments	2,724	0.11 acres
	Condominiums	6,481	0.29 acres

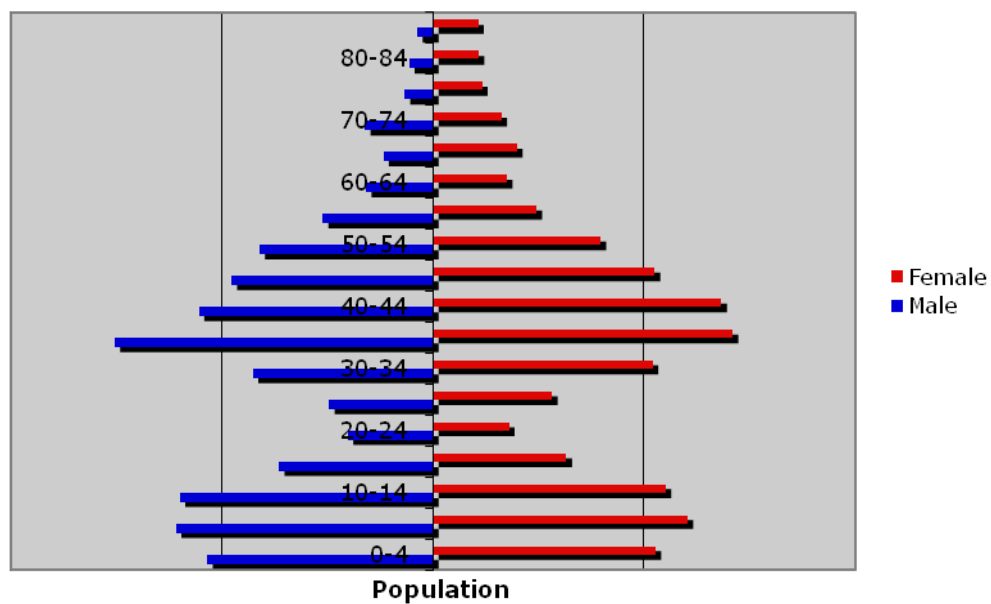
Source: MIT Center for Real Estate, 2006

Table 19: Employment Analysis for Boston Metro

Average Monthly Employment	All Industries	Retail Trade	Leisure and Hospitality	Manufacturing	Increasing Rate for all Industries from Previous Year
2001	2730	261	286	520	--
2002	2699	303	286	482	-1.1%
2003	2649	279	311	443	-1.9%
2004	2704	294	331	440	2.1%
2005	3088	446	375	508	14.2%
2006 (predicted)	3322	465	368	537	7.6%

Source: The Department of Workforce Development, Massachusetts, 2006

Figure 27: Town of Medway age cohort pyramid



Source: US Census 2000

Medway Design Recommendations

Figure 28: Zoning & Land Use Comparison

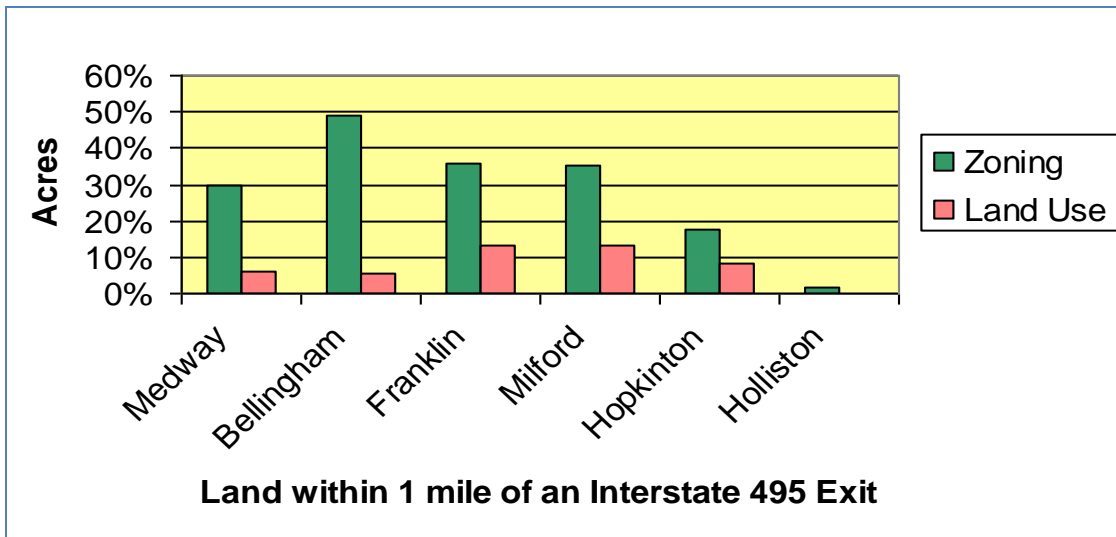
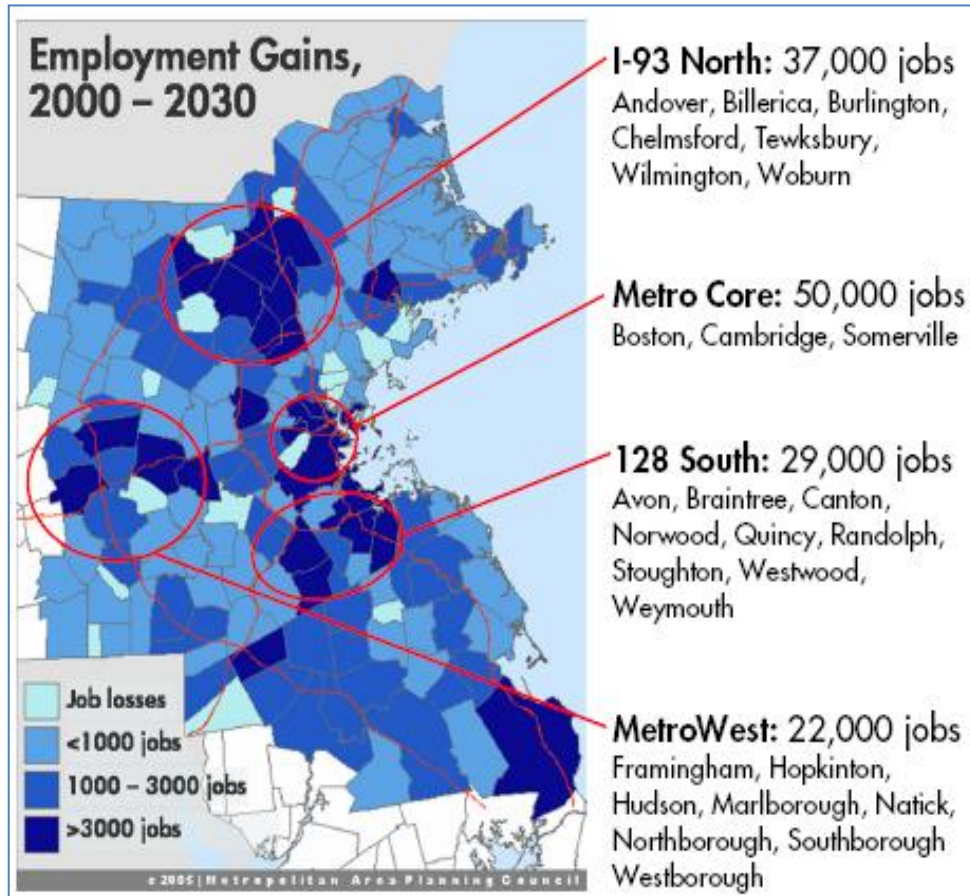


Table 20: Industrial and commercial zoning analysis-Medway and neighboring municipalities

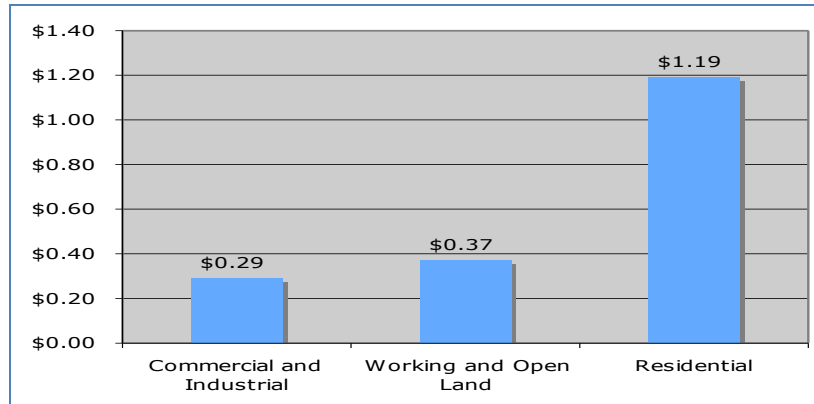
Industrial & Commercial Zoning and Land Use Comparison				
Land within 1 mile of an Interstate 495 exit, in acres				
Town	Land zoned	%	Land used	%
Medway	162.79	29.92%	31.62	5.81%
Bellingham	983.01	49.14%	111.44	5.57%
Franklin	1,433.65	35.83%	522.41	13.06%
Milford	1,110.46	35.30%	419.15	13.32%
Hopkinton	354.35	17.71%	170.36	8.52%
Holliston	3.52	1.53%	0.00	0.00%

Figure 29: Metro Boston employment forecast employment gains 2000 to 2030



Source: MAPC

Figure 30: Cost Per Dollar of Revenue to Provide Public Service



Source: American Farmland Trust, 2006