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SECTION 3 - COMMUNITY SETTING

A. REGIONAL CONTEXT

Sterling is an agricultural town of 21,000 acres, located in central Worcester County between Leominster and Worcester. It lies prominently on the Lower Worcester Plateau, a regional escarpment that separates the Wachusett Highlands from the Nashua River. Its neighbors are the towns of Princeton and Holden to the west; Boylston and West Boylston to the south, Clinton and Lancaster to the east, and the city of Leominster to the north. The construction of the railroads in the 1800's and Interstate 190 in the late 1970's, afforded ease of access to the urban centers of Clinton, Leominster, Fitchburg, Worcester, and Gardner, making Sterling attractive for industrial development in each era.

Sterling has abundant water resources: the town rests at the confluence of the Quinapoxet and Stillwater Rivers, which feed the Wachusett Reservoir. The DCR-DWSP has sought to protect the Wachusett Watershed which overlays the southwest portion of Sterling by acquiring or securing conservation restrictions on thousands of acres within the Town. The actions of the DCR-DWSP effectively help to protect Sterling's municipal wells, all of which were located within the Wachusett watershed as of 2008. To the north, the Wekepeke Brook flows to the Nashua River as part of the Nashua River Watershed. The northeastern section of the town shares water resource concerns related to the Wekepeke aquifer with the neighboring municipalities of Leominster and Lancaster as well as Clinton, which owns hundreds of acres of Wekepeke watershed lands and inactive reservoirs within Sterling, extending into Leominster near Heywood Reservoir and Sholan Farm.

Forests, farmlands, historic buildings, and open spaces preserve the rural character of the Town. Sterling has a rich agricultural history in dairy production and fruit crops. The many hillsides also offer scenic vistas of the Nashua River Valley and Wachusett Mountain. Old orchards, lovely stone walls, picturesque barns, and scenic waters border many roads. East Lake Waushacum provides recreational opportunities including a Town beach at Sholan Park. On the northern border both Leominster State Forest, managed by the DCR and Sholan Farms provide year-round outdoor activities. In addition, proximity to other recreational resources including the Wachusett Mountain Ski Area (off Route 140 to the north) and evolving connections between the Sterling Rail Trail, the recreation complex at Houghton Middle School and Muddy Pond Road, and Mass Central Rail Trail (to the south) make the Town an attractive place to live.

Sterling and the Montachusett Region experienced significant residential growth in the last few decades. The completion of Interstate 190, an overheated housing market in the Route 128 and Interstate 495 corridors, along with an abundance of relatively inexpensive open land precipitated the accelerated regional residential growth. As in other agricultural towns, a considerable amount of Sterling farmland became available for development due to the decline of dairy farming. Development pressures have affected forested lands and water resources, as well.

B. HISTORY OF THE COMMUNITY

The present day town of Sterling has been inhabited for at least 9,000 years, first by nomadic hunters who followed the game and lived here seasonally; then increasingly by more settled groups who took advantage of its many lakes, ponds, streams and ample natural resources. By the time of European contact in the 1600's, the Nashaway Indians had established large villages throughout the Nashua River Valley area, and lived in clusters about the East and West Waushacum Lakes. They had extensive acreage under cultivation. Early colonial sources indicate that hundreds of acres were farmed.

European settlement of the region began when Nashawhenon, the sachem, or chief, of the native Nashaway Indians sold 80 square miles to Thomas King in 1644 in exchange for establishment of a trading post. Sterling comprises the western part of the land purchase. The surrounding land was called the Nashaway Plantation and later was incorporated as the Town of Lancaster in 1653. Another 112 square miles was added to Lancaster in 1701.

The English colonists made much use of Indian paths in the area. One path, now known as Redemption Rock Trail, (Route 140) served as the main road for the Nipmuc and Wampanoag Indians between Wachusett Mountain and Rhode Island. Along this path, north of Sterling is a rock ledge known as Redemption Rock, where John Hoar re-

deemed Mary Rowlandson from her Indian captors in 1675.¹ Another path winded from Lancaster to the Waushacum Lakes. By the 1660's this path, now known as Chace Hill Road, had become a colonial cart path used by settlers who owned property near West Lake Waushacum. In 1717, the town of Lancaster widened the path and it became the first official road, later linking Lancaster (and Sterling) with points west.² A network of other Indian paths connected Wachusett Mountain to the "Old Connecticut Path" through parts of Sterling and Lancaster, which created linkages to Massachusetts Bay and Springfield.³

The present center is the original religious and political center of the Town of Sterling. In 1741, the town was set off from Lancaster as the second or west precinct parish to provide for the large number of residents who found it difficult to attend Church in Lancaster. Lancaster voted to build a meetinghouse for the new West Parish the following year, in 1742, and founded the center village. After nearly 40 years of petitions, the parishioners voted to separate from the mother town at the annual town meeting, which had rotated to Sterling. The parish voted to incorporate as the town of Sterling in 1781, naming the town after General William Alexander, Lord Stirling, under whom several prominent citizens had served in the Revolutionary War.

The economic development of the center coincided with Sterling's growth as a social and civic center. After incorporation in 1781, commercial properties developed along Main Street, south of the common, at the junction of the Princeton, Worcester, and Leominster Roads. Residential development in the center first clustered on Maple Street, Meetinghouse Hill Road, Princeton Road, and Worcester Road, radiating out from the Common toward local farms and surrounding towns. Small manufacturing shops intermingled with residential buildings and barns along these roads.

In 1799, the town rebuilt the first meetinghouse in its original location, first demolishing the old meetinghouse and re-grading its common land, then draining and filling a portion of marsh located where the 1835 Town Hall and business block is today. The parish built the new church very near the site of the old church of 1800. In 1801, the town built a town hall at the site of the present 1835 town hall. It was the first in Massachusetts that separated church and state (government) meeting places.

Like many Massachusetts towns in the early 1800's, the town center developed rapidly as a small nucleus of light industry powered by small streams. Chairmaking was the most prosperous industry. Hat manufacturers, blacksmith shops, shoemakers, cabinetmakers, scythe-snath makers, taverns, stores and a tannery were also important industries in the town. After the 1840's Sterling center declined as a manufacturing center as insufficient waterpower made it uncompetitive with well-watered mill towns such as nearby Clinton. Yet Sterling retained a niche as a cradle for other industries. The Butterick Pattern Company, a well-known national brand among home sewing circles, is an example of one of many businesses that began in Sterling center and moved to other towns as they grew in size and economic scope.

Another expansion of the center village came with the construction of the railroad in the 1840's. Irish immigrants came to Sterling to build the railroad and Worcester Road south of the Town center. The arrival of the Fitchburg and Sterling line in 1849 opened a new era of activity and prosperity as a freight depot for farm products, an era which lasted through the rest of the century and changed the agricultural focus of the town. The rail service also opened commercial markets in more urban centers. By 1850, three railroad lines, serving Boston, Fitchburg and Worcester and points beyond, made thrice-daily stops for freight and passengers.⁴ The railroads made possible a general New England trend toward specialty market products. By the 1880's, the railroad service spurred the markets for Sterling's dairy and fruit crops in Boston.

The advent of the railroads sparked a twenty-year period of intense real estate speculation by farmers, entrepreneurs and businessmen throughout town. During this time, builders, wealthy manufacturers, and businessmen built homes for speculative sale or as rental properties, a departure from the previous custom of building homes for specific per-

¹ Russell, Howard S, *Indian New England Before the Mayflower*, University Press of New England, 1980, p 203.

² Based on an informal review of old maps and farmstead locations, OSIC suspects that part of the historic Chace Hill Road now lies on Squareshire Road and extends southward through DCR lands across Route 110 to the Wachusett Reservoir and may be a DCR fire road. The alignment holds interest for regional trail connections.

³ Prescott, John, *The Founder of Lancaster, 1603 To 1682*, By Hon. Henry S. Nourse.
<http://www.usgwarchives.net/copyright.htm>

⁴ Karr, Ronald Dale, *The Rail Lines of Southern New England: a Handbook of Railroad History*, Branch Line Press, Pepperell, MA © 1995.

sons. The railroad also enhanced the popularity of the Methodist Association Campgrounds (now referred to as Waushacum Village) near the south shoreline of the West Lake Waushacum. During the late 1800s, the town continued to grow as a summer resort destination with the development of Waushacum Park with activities ranging from a steam ferry to a lakeside dance hall on the West Lake Waushacum.

The new prosperity and a growing population in the largely agricultural community prompted a need to expand the facilities of the town. During that period, regional population growth also led to the construction of the Wachusett Reservoir, which commenced in 1895, and mandated the abandonment of nearly 1,400 acres of Sterling farmland in the vicinity of the reservoir. In the 1870's, Italian workers came to build a section of Worcester Road, the Wachusett Reservoir, and the Fitchburg to Worcester trolley line. Some of the people lived in the rental properties built by the real estate speculators. The town built a high school to accommodate an overcrowded school system. It was used as a high school until 1934 and is now the Electric Light building. Edwin Conant built the Conant Public Library and gave it to the town.

The construction of the regional water system also prompted the abandonment of the excursion boat business and Waushacum Park in 1916, when the West Lake became part of the Wachusett Reservoir system, effectively reducing the vacation business brought into the town's stores and hotels, and lessening the demand for the railway. Although East Lake Waushacum geographically lies within the Wachusett Watershed, the outflow of the East Lake Waushacum was ultimately re-routed eastward and away from the Wachusett watershed, enabling the recreational access to the East Lake that still endures today. The town beach at Sholan Park was established in 1934.

The town of Clinton, in the late 1800s, petitioned the state of Massachusetts for the rights to possess two parcels of land within the Wekepeke Watershed containing a combination of interconnected surface and ground water resources in Lancaster, Leominster, and Sterling to serve as a public water supply. The region includes five reservoir basins, the Wekepeke Brook, and the underlying Wekepeke Aquifer. In 1876, the state legislature enacted a law; Chapter 98 entitled "An Act to Supply the Town of Clinton With Pure Water." By its terms Clinton was authorized to "take and hold the waters of Sandy Pond ... and of any other natural pond, or ponds, brook, or brooks ... to supply itself and its inhabitants with pure water to extinguish fires, generate steam, and for domestic and other uses, and ... establish public fountains and hydrants and to regulate their use."

On February 9, 1882, the state enacted into law Chapter 14, An Act In Addition to the Acts to Supply the Town of Clinton with Pure Water," which authorized Clinton to take the waters of Wekepeke Brook, in the town of Sterling or any reservoir thereon." Clinton purchased some of the land and acquired other parcels by eminent domain. Jonas E. Howe, the town Water Commissioner, devised a distribution system to conduct the water into Clinton. The first parcel encompasses the Upper Lynde, Lower Lynde, and Spring Reservoir basins. The second parcel encompasses the largest reservoir in the system, the Heywood basin. Located between two large hills, the Heywood site is in one of the highest areas in Sterling. Because of the greater elevation of the reservoirs in relation to Clinton, the water supply was gravity fed through pipes to a distribution reservoir at the top of Burditt Hill in Clinton.⁵

Changes in the regional economy in the early 20th century led to a decline in the importance of Sterling as a commercial center; with the expansion of the railroad came the industrial age, westward migration, the attraction of urban environments and employment possibilities, and significant changes in lifestyle. By 1900, the agriculturally dependent cider mill was the only large manufacturing left in the center of the town. The introduction of the automobile and construction of the state roads reduced the farmer's dependence on rail transport and the depots in the center, Pratts Junction and Sterling Junction, facilitating the timely movement of farm goods to urban regions and resulting in economies of scale, shifting the food production needs. All of these conditions contributed to the abandonment of cleared fields on the region's farms, allowing them to reforest.

Despite the 20th century intrusions in the center and its outskirts, Sterling retained the atmosphere of a rural 19th century village that grew outward from a civic center. The town common (still owned by the Unitarian Parish) has always served as a focal point of community activity.

In the last quarter of the 20th century, regional growth pressures began to threaten the 19th century character of the Town. The construction of Interstate 90 in 1978 rekindled the residential and commercial development of Sterling. This major highway slices across the town of Sterling, linking Route 2 a major east-west corridor to the north to Interstate 290 and Worcester to the south. This made the town more desirable to people working in the Worcester

⁵ Town of Clinton, Reports of the Officers and Committees of the Town of Clinton, Years ending 1878 and 1896, Coulter Press, Clinton MA 1879 and 1897.

area as well as the greater Boston area. As the population of Sterling increased, many of the former farmlands that once enclosed the center developed into modern residential subdivisions. In 1997, the town voted to change the dimensional requirements in rural residential zones, shifting from a minimum lot size of 1 acre to 2 acres.⁶

One of the most important factors that helps preserve Sterling's rural character is the active protection of watershed lands for Wachusett Reservoir. During the late 1980's and 1990s, the state embarked on an extensive program of land acquisition along major waterways and associated uplands as a way to protect reservoir water quality.⁷

In 2003, the legislature approved the merger between the MDC and the Department of Environmental Management (DEM) to form the Department of Conservation and Recreation (DCR) in an effort to cut down on duplication of services and improve park management. The new department consists of the Division of State Parks and Recreation (the former DEM), the Division of Urban Parks and Recreation, and the Division of Water Supply Protection (DWSP, the former MDC).

With increased funding, DCR-DWSP has again, since 2005, made a concerted effort to acquire parcels in fee or through conservation restrictions to both ensure water quality and avoid the need to build an expensive filtration facility. (The DCR-DWSP water supply is the largest in the country that does not require filtration.) At the end of FY 2009, DCR-DWSP has acquired 4,579.4 acres in town, bringing the total protected watershed acreage in Sterling to 5,148. This means that just over 25 percent of the town's acreage area is under the care and control of the DCR-DWSP. Various recreational opportunities are possible on these lands, but there are strict limitations on some parts of these lands, particularly those on the reservoir or immediately upstream of the reservoir (i.e.—no dogs, horses, boating, swimming or wading). Other DCR-DWSP lands and waters allow for limited boating (no gas power,) fishing, hunting, hiking, and biking.

The Town of Clinton had used the Wekepeke Watershed and Heywood Reservoir as its primary water source since the 1880's, and officially decommissioned it as a town water source in 1962 when demand exceeded the capacity. Due to high maintenance costs and the availability of the Wachusett Reservoir as a water source for the town, Clinton has held the land in an undeveloped state, essentially closed to the public, but it has supported recreational activity.

Due to the geography of Sterling, the vast majority of the protected land is in the western and southern part of the town, as DCR-DWSP efforts focused solely on Wachusett watershed lands. In the northeastern and eastern regions of the town located in the North Nashua drainage, there is a relative dearth of permanently protected open space. These areas are most likely to be subject to higher development pressures over time.

Development pressure continues to threaten the prehistoric evidence and the colonial and early industrial history of the town. While the lack of town sewage capacity in Sterling inhibited industrial, commercial and residential development, the overheated housing market of the greater Boston area in the 1990's and early 2000's forced an ever-expanding ring of development at the perimeter of the commuter range for Boston and the Interstate 495 corridor. At the time of this writing (2009), a major national economic downturn that began in 2008 has slowed development in town, with few new building permits issued. This could be an opportunity for the town to take time to look at and plan for future land development scenarios.

C. PROGRESS ON 2002 ACTION PLAN

Following submittal of the 2002 Open Space and Recreation Plan (OSRP) to the state in September of 2002, the *ad hoc* Open Space and Recreation Committee posted the plan on the Town's website. At the 2003 Annual Town Meeting, the *ad hoc* committee⁸ then requested the Town to create a permanent implementation committee, comprised of all of the members⁹ of the *ad hoc* committee, with Robert Spencer¹⁰ as Chair (2004 through 2007). In 2004, the Town of Sterling contracted with MRPC to produce the EO 418 Community Development Plan, which incorporated the 2002 OSRP. At that time, OSIC coordinated with MRPC on these planning efforts. MRPC developed an analysis of land use priorities and conflicting demands as part of the planning effort. MRPC also developed

⁶ Special Town Meeting February 19, 1997, Article #1.

⁷ The former Metropolitan District Commission (MDC)

⁸ chaired by Maryanne MacLeod

⁹ Robert Spencer (OSIC Chair), Brian Cline (Vice Chair), Marion Larson (Secretary), Maryanne MacLeod (Treasurer), Robert Protano (Planning Board Chair), and Sue Valentine (Conservation Commission member)

¹⁰ (the Selectmen's delegate to the Montachusett Regional Planning Commission (MRPC))

a GIS data set that included a trails layer, which could serve as a foundation for mapping to include in a trails guide for Sterling trails. At a public forum, MRPC explained the four elements of the Community Development Plan (CDP) and the residents in attendance broke into focus groups to outline priorities for each element, which MRPC staff sketch mapped into the GIS in a live demonstration of the GIS software. The 2004 CDP addresses housing needs, open space and natural resources protection, economic development and transportation; attempts to reconcile where these four elements could conflict in future development; and illustrates the community's visions for recommended land management strategies in an Action Plan map. The resultant CDP Action Plan Map made recommendations pertaining to appropriate siting of affordable housing.

In 2000, the DEP had determined that 74 individual septic systems at the Sterling Camp Meeting Association violated Title 5 regulations and posed a health hazard, and unless a solution was introduced, the area would not be allowed to sustain residents. Both the 2002 OSRP and the EO 418 CDP had discussed the problems facing the Camp Meeting Association inhabitants, and the ad hoc OSRP committee had planned to explore alternatives for water quality management and mitigation at critical areas like East Lake Waushacum through facilitating communication, planning, and coordination with related organizations and authorities, and investigating funding opportunities for infrastructure improvements.¹¹

Upon the Select Board's adoption of the EO 418 Community Development Plan, the Town hired John Ryan of Breezeway Consulting of Boston to write a Community Development Block Grant application to fund a housing rehabilitation, public facilities, and septic management program for the Camp Meeting Association area. Ultimately, MRPC succeeded in procuring a Rural Housing Development loan program in 2007, which enabled the Town to leverage additional funding sources. Following dissolution of the Camp Meeting Association in 2006, the Planning Board approved the Sterling Campgrounds, now known as the Waushacum Village Homeowners Association ("Wauschacum Village"), as a 75-lot ANR and plans for a new septic system for its residents were filed with the Department of Environmental Protection.

In July of 2007, the Waushacum Village Association learned they would receive CDBG funding for the septic system improvements. Funding for the \$2.2 million dollar project came through a \$1,560,000 loan and a \$670,000 grant from the U.S. Department of Agriculture Rural Development Program, as well as an \$884,409 Community Development Block Grant from the federal government awarded by the Massachusetts Department of Housing and Community Development. In November 2007, the Town Meeting authorized transfer of another \$200,000 from Water Enterprise Retained Earnings "to pay for water repairs and reconstruction in conjunction with receipt of a CDBG grant of \$885,000 for septic improvements at Waushacum Village." Furthermore, in 2001 the state secured \$217,000 for a CR on open lands of the Association with a focus on watershed protection. Additional financing for the septic system will derive from monthly payments from each household to repay the loan over 40 years and from the sale of the existing house lots to the residents for a minimal fee.

The proposed system, which includes a collection system, new sewers, a pumping station, a leach field, and a pre-treatment system, will serve 75 homes and a flow of about 15,000 gallons of water a day. Installation of the system will also aid in providing more housing for the disabled, low-to-moderate income residents, and senior citizens. The success of the project may serve as a useful model for similar projects in other areas.

Concurrently with development of the 2002 OSRP, the Recreation Committee appointed an *ad hoc* Recreation Site Selection & Development Committee to evaluate all parcels over a 15-acre minimum for their development potential for a soccer field. According to a past member, the *ad hoc* committee selected a portion of the Town Forest not owned by the Conservation Commission (West of Holden Road in West Sterling) for the project. After evaluating the possible change in land use, the DCR-DWSP negotiated purchase of a CR on the Town Forest land of interest and recommended that the *ad hoc* committee look toward an evolving multi-disciplinary project focused on the long-term use of lands including the Sterling Airport. According to the past member, discussions suggested that the CR funds from DCR-DWSP would go to the *ad hoc*'s initiatives related to active recreation fields. Since that time, interest in siting a new soccer field seems to have waned in public support, the *ad hoc* apparently dissolved, and the problem seems temporarily mitigated through better scheduling of the existing recreation fields. After voters extended the town's right to purchase three Chapter 61A parcels (125-6,10 and 116-1) to the Trust for Public Land, the lands, including approximately 75 acres and significant frontage adjacent to the active Sterling Airport lands, were ultimately transferred to the DCR-DWSP in 2007 with no known future rights to access. The Airport site remains open, but remains subject to frontage constraints coupled with development pressures.

¹¹ Goal C, Objective 2, Action 3, of Action Plan, Town of Sterling 2002 Open Space and Recreation Plan.

The first goal of the 2002 OSRP, to identify and seek to preserve significant open space, cultural, and recreational resources, set the marching orders for one of its most important projects, conserving the Rittenhouse farm for the protection of the East Lake Waushacum Watershed.¹² In 2003, the Conservation Commission established an *ad hoc* Rittenhouse Committee to pursue Town purchase of the 47-acre Rittenhouse property for conservation and passive recreation. The Trust for Public Land (TPL), the Sterling Conservation Commission, the East Lake Waushacum Association (ELWA), and OSIC members all gave professional support to the *ad hoc* Rittenhouse Committee. In 2004, the *ad hoc* committee orchestrated the purchase of the Rittenhouse property (now referred to as “Waushacum Overlook”) at the February 2004 Special Town Meeting, through a creative combination of funds, including approximately \$100K in donation, which helped to justify \$250K in Self Help funds awarded to the Sterling Conservation Commission. With the enduring support of TPL, the Town negotiated a CR for the 13-acre historic apple orchard, and a lease with a local farm to keep the orchard in production. Volunteers worked with TPL and local developer Ralph Meunier to procure a future driveway easement at the Tara Lane entrance to Waushacum Overlook. TPL also worked to clarify town rights associated with easements to both Tara Lane and Adam Taylor Road, both of which abutters still question.

With the support of the *ad hoc* Committee and formal guidance of the Conservation Commission, a graduate student from the University of Massachusetts prepared a master plan for Waushacum Overlook for development of parking areas, interpretive trails, and an overlook patio with benches. The plan considered both hiking and horseback trails. Members of the *ad hoc* committee supported Eagle Scout Candidate Matt Seaver’s efforts to improve access and trail development of the Rittenhouse property for Waushacum Overlook, formally managed by the Conservation Commission. Other efforts included sign-mounting, tree planting and ongoing planning for the site.

With the support of the Conservation Commission, ELWA, and OSIC, *ad hoc* members have supported efforts to improve access and trail development on the Rittenhouse property, including installation of trail signage and benches, and attendance at the official commemoration of the site held at the Tara Lane trailhead. Members of OSIC contributed to a DCR Trails grant application by the Conservation Commission that proposed to connect the Waushacum Overlook trails to adjacent DCR lands and other Conservation lands near East Lake Waushacum and Sholan Park (Town beach area).

As a first step in developing a set of ranking criteria for land protection, OSIC also developed a standardized Land Inventory Form as a tool for organizing details and creating profiles of selected individual open space parcels. OSIC has investigated the Assessor’s records pertaining to the lands enrolled in the Chapter 61, 61A and 61B tax abatement programs and has found the current assessor’s database cumbersome and difficult to query reproducibly, with a high confidence level in the queried information. The root cause of these challenges relates to multiple (or mixed) uses and classifications for single parcels.

The Conservation Commission also completed an inventory of forests on its land holdings to support forestry planning. Steve Hoffman of the Massachusetts Association Conservation Commissions has certified vernal pools for the Conservation Commission. OSIC members have had informal personal discussions with several landowners concerning their protection interests and the like at the OSIC exhibit at the Town Fair and other venues. OSIC also organized several site walks of properties of interest as Open Space.

In 2003, 2004, and 2005, OSIC members participated in the Mass Central Rail Trail (MCRT) coalition, worked with Wachusett Greenways to identify rail trail linkages and participated in Wachusett Greenway’s Sterling Rail Trail opening. In 2004, 2005, and 2006, OSIC also worked with the West Boylston Open Space Advisory Committee to organize neighboring town open space committees. In January 2005, the West Boylston Sterling committees co-hosted a Regional Open Space Alliance Meeting, inviting representatives from West Boylston, Sterling, Boylston, Clinton, Holden, Princeton, and Worcester, as well as a host of regional land protection focused organizations, at which the group established the Massachusetts Municipal Open Space Alliance (MiMOSA) to coordinate on projects of regional importance.

Together, the two committees co-sponsored and organized the Sterling Fair land conservation exhibit (The Lands and Waters We Love), with about 20 organizations exhibiting at the fair for three years. At the most recent exhibit, the two planning groups offered handouts for landowners regarding state/federal programs ranging from USDA to forest stewardship, which enabled OSIC to collect relevant public feedback. OSIC did not participate in the land conservation exhibit at the Sterling Fair in 2007, due to resource constraints and a shift in committee focus to efforts

¹² Goal A, Objectives 2 and 3, of Action Plan, Town of Sterling 2002 Open Space and Recreation Plan.

to revise the 2002 OSRP. In support of the public outreach component of the OSRP revision process, OSIC conducted a pilot test of the 2007 Open Space and Recreation Survey at the 2007 Sterling Fair. Sterling exhibited at the grand opening of the DCR Stillwater Interpretive Farm during the 100th anniversary celebration of the Wachusett Reservoir and Tower Hill Botanical Gardens. The Town developed a farmer's market and established an Agricultural Commission, which meets the first Monday of each month at 7:30pm, in the Butterick Municipal Building.

In 2005, the Board of Selectmen established an ADA review committee and appointed members to it, though at present, these positions are vacant and the committee has not met for some time. The Board of Selectmen also appointed an Affordable Housing sub-committee to draft a housing plan, and a Chapter 40B review committee to review 40B development projects to encourage consistency with Town goals and objectives. That same year, the Sterling Affordable Housing Committee contracted Karen Sunnarborg, Housing and Planning Consultant, to produce The Sterling Affordable Housing Plan. The plan listed a few town-owned properties and recommended several approaches to utilizing privately owned properties.

In 2005, OSIC evaluated the attributes of the Community Preservation Act. OSIC sought to create sources of funding for meeting Town preservation objectives by initiating a campaign to educate other Town boards and committees about the Community Preservation Act. With its local passage, the CPA would serve as a dedicated source of locally controlled state-matching funds for affordable housing, historic preservation, and open space and recreation initiatives. OSIC planned to have the CPA on the Town ballot vote in 2006.

In 2006, OSIC initiated an educational effort within the Town Hall and throughout the Town, and sought support from the Board of Selectmen for an *ad hoc* committee representing the OSIC, Conservation Commission, the Historic Commission, Affordable Housing Committee, the Recreation Commission, and the Planning Board to draft ballot question language and lead campaign efforts. The *ad hoc* committee placed a ballot question on the spring ballot election by petition to see if voters would support a 1.9% CPA levy to leverage matching funds for numerous community objectives. Despite extensive educational efforts through the press and open forums, Sterling voters rejected the ballot question at the Spring Ballot Election.

In keeping with its objective to encourage appropriate growth management controls, OSIC supported the town in considering several Protective and General Bylaw changes. These included a conservation bylaw, a stormwater management bylaw, an earth removal bylaw, a Wind Energy Bylaw. The 2002 OSRP had discussed the intent of the Conservation Commission to pursue a change to the Protective Bylaw to include a new Conservation Bylaw to enhance the protections established by the Wetlands Protection Act, the Rivers Protection Act, the Watershed Protection Act, and the Clean Water Act. Goal A, Objective 1, Action 5 of the 2002 OSRP stated: "Support the Conservation Commission's proposal to the Town for a Conservation General Bylaw as it supports this plan." The Conservation Commission attempted to implement a Conservation Bylaw in 2003, but voters turned it down at Town Meeting due to concerns with the language of the bylaw. The Conservation Commission intends to revisit adoption of a Conservation Bylaw, and OSIC has included a similar action item in its 2009 OSRP.

At the encouragement of Ed Himlan et al Massachusetts Watershed Coalition, the Conservation Commission, the Planning Board, and the DCR, voters at the 2009 Town Meeting approved passage of a stormwater bylaw to manage stormwater runoff, promote groundwater recharge, and prevent water pollution from new development and redevelopment. Administered by the Conservation Commission, the bylaw established regulations for land development activities, stormwater management standards and design criteria, and maintenance provisions for stormwater management facilities. It placed limits on the amount of allowable stormwater runoff from new development, encouraged the use of "low-impact development practices," and set procedures for the Town's review of stormwater management plans and for the Town's inspection of approved stormwater treatment practices. The bylaw also reinforced the provisions of the Town of Sterling Flood Plain District, the Stillwater River Protection District, the Aquifer, and Water Resource Protection District.

In response to public pressure for protection of the water table from perceived threats arising from gravel operations, OSIC had included an action to adopt regulations to require all gravel operations in Sterling's aquifers to leave a buffer filtration layer of at least eight feet of gravel above the water table to prevent groundwater pollution from subsequent land uses. Since that time, the town developed and passed its Earth Removal Bylaw, which created the Earth Removal Board.

At the encouragement of the Sterling Municipal Light Department and the Planning Board, voters at the 2009 Annual Town Meeting approved an amendment to the Protective Bylaw governing Wind Energy Conversion Systems

(WECS). The bylaw establishes the Sterling Planning Board as the Special Permit Granting Authority (SPGA) for WECSs, and provides criteria for the development and use of wind power as an alternative energy source. Provisions include a limit of one tower per lot or on contiguous lots held in common ownership, a maximum height of 100 feet (130 feet as part of the special permit process), and specifications for acceptable design. The bylaw also governs siting restrictions, noise regulations, control of adverse impacts and electromagnetic interference, site security, compliance with Massachusetts State Building Codes, FAA Regulations, and National Electrical Code, and abandonment.

Commencing in 2005, the Sterling Play Area Recreation (Sub) Committee (SPARC) of the Recreation Department worked diligently to transform an unused open space located at Muddy Pond and Griffin Road to a promising community space with a vibrant pond known as the Sterling Greenery Community Park. The site features a waterfall installed in the pond, which improved the quality of the water for the pond inhabitants and beautified the area; as well as a walking path, walkway pavers, plantings, some play equipment, and fencing. SPARC commenced Phase II of SGC Park in 2008, and constructed a pergola shade structure, installed a swing set, and continued placement of walkway pavers. Members of SPARC commenced fundraising efforts to install additional play structures for both 2-5 year olds and 5-12 year olds; picnic tables and benches; signs and other park accessories.

In August 2006, Planning Board Chair and OSIC member Robert Protano, hosted an informal gathering of the Planning Board and OSIC in an effort to foster inter-board communication. OSIC also attended All Boards Meetings in April and November of 2007.

In 2008, OSIC monitored and supported local volunteers interested in creating unique recreational spaces for residents, including a skate park concept discussed at the 2008 Community Forum, and a dog park concept introduced by OSIC member Sue Valentine who identified an anonymous donation for the initiative. Personal communication with at least one adult resident at the Open Space and Recreation Plan Public Forum revealed potential support for a BMX bicycle park, as well.

Throughout the past six years, OSIC participated on the Wachusett Working Landscapes Partnership (WWLP), a function of the Massachusetts Watershed Coalition, comprised of municipal volunteers and officials and open space and community planning professionals, serving the 10 plus towns surrounding Wachusett Mountain, as it sought strategies to protect green linkages around the mountain. OSIC also monitored the activities of the Mass Central Rail Trail (MCRT) Coalition and sought opportunities to connect significant attractions, unique parcels of land, regional trails, and open space resources, supporting the development of a continuous 100 plus-mile rail trail between Northampton and Boston. Since part of the original MCRT rail bed lies under the Wachusett Reservoir, lands within Sterling may serve as a critical bypass. OSIC also supported MRPC's Trail Inventory project, which sought to inventory current trails and assessed the potential for future trail connections.

In support of the goal to extend the Sterling spur trail northward from Town center up to Chocksett Road, OSIC reviewed a proposal to rezone 55.53+/- acres of land from rural residential and farming to industrial. OSIC assessed the preliminary industrial site plan, impacts to the Zone II (aquifer recharge) and stream habitat impact, abutters, and rural character; and pedestrian concerns related to the Route 12 corridor. Volunteers worked to influence donation of land abutting Oak Hill Cemetery as part of the 2007 rezoning agreement. Ultimately, OSIC voted unanimously in favor of the rezoning contingent upon the landowner's agreement to:

1. Set forth a "no touch" buffer zone between the rezoned land and abutters,
2. Donate a portion of land abutting Oak Hill Cemetery to the Town of Sterling, and
3. Define and donate an easement to Wachusett Greenways, setting the stage for a northerly extension of the rail trail to Chocksett Road.

OSIC presented results of the assessment at the 2007 Annual Town Meeting immediately prior to the vote on Article 6, and the article passed. The landowners agreed to extend an easement through the rezoned lands, setting the foundation for extending the trail. In late 2007, OSIC participated in site assessment activities related to the Wachusett Greenways easement. The agreements negotiated for the rezoning of the land resulted in the gift of a small parcel along the rail trail extension next to Oak Hill cemetery and the historic rail bed to the Town of Sterling.¹³

¹³ Worcester South District Registry of Deeds Book 43556 Page 194.

In 2007, the Sterling Land Trust closed on a CR with Spanknebel that protects property abutting Twin Oak along Route 12. Protection of the Wekepeke Brook, which flows directly through this property, may be a good secondary reason for the town to reconsider Twin Oak as a potential site for the Senior Center. Volunteers informally communicated considerations pertaining to pedestrian safety related to MassHighway's proposed Route 12-Chocksett Road rotary to representatives of Wachusett Greenways, MassHighway, and the Board of Selectmen.

OSIC members conducted regional trail planning with Dick O'Brien, Jim French, and Ed Yaglou of Wachusett Greenways, meeting on the same day as events held at TTOR in Leominster. Trail planners investigated potential short-term destinations for the trail and regional connection possibilities. Planning efforts focused on ways to build connectivity, creating trail connections linking Sholan Farm to Sterling Town Center with no specific "trail type" identified. Recognizing the possibility of extending the rail trail to the police station, the group explored a connection from the police station to Sholan Farm, considering several options including roads, private lands, active roads, historic town roads, and AT&T transcontinental cable easements (previously cut on routine basis), among other options.

Developer Simpson granted an easement across a strip of land on the east side of "Stump Pond" near the police station (behind the state DPW on Chocksett Rd.) and contiguous to existing town Conservation land Wekepeke tributaries flow thru this pond, which reportedly has both trout and bird habitat. This site, bounded by Simpson land to the east, railroad to the north, capped town dump to the west, Industrial Way (U-shaped industrial road off Chocksett Road) to the south, may serve as a possible key destination for the rail trail extension. The Conservation Commission continues work with Simpson (developer) in an effort to create park-like access to the east shores of "Stump Pond." Per Bob Protano, the abutting Simpson-owned industrial site was under consideration for a non-profit operation involving the physically and/or mentally challenged workforce. The park site seems complementary if pond access is safe and existing habitat is not lost (there is an extensive bird habitat and possibly cold water fish in the Wekepeke feeder stream fed pond). The site is a tentative destination for rail trail extension and if longstanding commitments are upheld, could eventually be the subject of a future PARK grant application.

Since 2007, OSIC has monitored the status of a proposed conservation restriction (CR) on Town of Clinton owned Wekepeke Watershed lands surrounding Heywood Reservoir, Fitch Reservoir, Lower and Upper Lynde's Reservoir, and Spring Reservoir. In 2007, the Town of Clinton issued a request for proposals to explore the potential of tapping its water reserves. The Nestle Water North America and the Town of Clinton cooperatively initiated testing the Clinton-owned land as a potential commercial source of sub-surface spring water, heightening community concerns about the status of the CR land protection. Townspeople had overwhelmingly expressed their concern for the preservation of the Wekepeke lands by sending over 700 letters to the Sterling Select Board and State legislators and obtaining nearly 1,000 signatures on a petition to preserve this land. Although Nestle staff stated that they support the CR at a Conservation Commission meeting, visible progress on CR negotiations was still limited by the end of 2007.

Due in part to intense opposition from Sterling residents, the Town of Clinton rejected the Nestle's initial bid on that town's request for proposals. The delayed status of the CR inspired OSIC members to issue a letter to Division of Fisheries and Wildlife (DFW) urging for progress with the CR negotiations. Chapter 289 of the Acts of 2004 of the Massachusetts Legislature summarized the intention to create the CR, clearly stating, "The Town of Clinton retains the rights to use water in the Wekepeke watershed lands as a potential water supply for the town." On June 24 2008, the Department of Fish and Game accepted the conservation restriction granted to DFW by the Town of Clinton,¹⁴ for acreage surrounding the reservoir effectively reducing concerns for the protection of the Heywood Reservoir, though the CR does not affect the right of the Town of Clinton to tap its water supply. The MassWildlife CR only partially resolves OSIC concerns surrounding the issues associated with the Town of Clinton lands.

In 2008, OSIC continued interaction with the MRPC, WWLP, Mass Central Rail Trail (MCRT) Coalition to gain a better appreciation for regional issues and resources available to the Town of Sterling. OSIC also initiated contact with a new open and recreation committee forming within the Town of Lancaster, but de-prioritized participation with MiMOSA due to its resource constraints, although regional interaction still occurs with other Towns. West Boylston's Open Space Advisory Committee hosted a joint meeting in West Boylston.

¹⁴ Chapter 289 of the Acts of 2004--An Act Authorizing the Division of Fisheries and Wildlife to Take or Acquire Conservation Restrictions in and to Lands of the Town of Clinton includes reference to the Clinton-owned "Wekepeke Watershed Lands" within Sterling and Leominster. <http://www.mass.gov/legis/laws/seslaw04/sl040289.htm>

In 2007 and 2008, OSIC interacted with other groups and individuals, held multiple meetings with other Town boards, and attended the April and November All Boards Meeting. OSIC then shifted its focus in 2007 to revising the 2002 OSRP. In support of the public outreach component, OSIC coordinated an update of the Open Space and Recreation Survey and launched the 2007 Open Space and Recreation Survey in late September and distributed it to Sterling households in both hard copy and electronic form, with a requested deadline of October 31, 2007. Hard copies of the survey and drop-off boxes were available at various Town center locations. OSIC published the survey in the October 20, 2007 issue of the Sterling Meetinghouse News, and on the official Town of Sterling website in PDF format. OSIC initiated efforts to compile the survey results in late 2007 along with plans to present the results at a 2008 Open Space and Recreation Community Forum.

In 2008, OSIC continued its efforts to update the OSRP, although constraints on budget and volunteer time delayed its completion. OSIC's FY 2008 annual budget was constrained to \$250 and all efforts to identify alternative sources of financial support for the OSRP update had failed through the end of FY 2007. OSIC had attempted a submission of the update in 2007, but delayed its completion, based in part on input from the DCS division of EOEa and due in part to budgetary constraints and the fact that the Town of Sterling was not submitting any Self-Help or other grant applications. OSIC continued to work on the update, but faced difficulties and constraints on volunteer time. The Board of Selectmen authorized the OSIC to use the Town's 2007 and 2008 annual allocations of eight hours of free MRPC GIS support to help with the OSRP mapping requirements. OSIC combined its pool of 16 hours of MRPC GIS support with \$185 in FY2008 funds and many hours of volunteer data preparation to generate four draft digital (GIS) maps: Open Space Inventory, Geologic Features, Zoning and Zoning Overlay Districts, and Water Resources.

In FY 2009, the Town increased the OSIC budget to \$2,675, based in part on the need for funds to complete the OSRP update, as well as to support ongoing OSIC initiatives. OSIC committed up to \$500 to MRPC for additional mapping efforts related to the OSRP plan.

OSIC committed \$300 to the American Farmland Trust in support of its Cost of Community Services Study. This important study, funded from contributions from the Sterling Land Trust, Conservation Commission, and a Town Meeting vote, concluded that commercial, industrial, farm and open land help keep down Sterling's tax rates. Residential land uses created a deficit of \$1.5 million; the other three categories generated surpluses: \$927,222 from commercial, \$705,662 from industrial, and \$530,501 from farm and open land.¹⁵

For each \$1 of revenue received from residential properties in fiscal year 2008, Sterling spent \$1.09 providing services to those lands. For each \$1 from commercial land, the town spent 24 cents; for each \$1 from industrial land, the town spent 29 cents; and for each \$1 received from farm and open land, the town spent 34 cents providing services. While residential land use contributes the largest amount of revenue, its net fiscal impact is negative. In contrast, land kept in active farming had positive net fiscal impact of \$19,740,475. This was calculated based on the direct agricultural revenue anticipated, the economic ripple effect of local spending from farm revenues (using an economic multiplier of 1.6), and the fiscal impact to the town's annual operating budget (opportunity cost) that would result if the town's open space were converted to residential development. It is important to consider that industrial commercial land use fosters increased demand for residential housing, while farm and open space generally does not.¹⁶

Although it was an important objective in the 2002 OSRP, to date, OSIC has not taken action on instituting a formal sign-off procedure in decisions regarding land transfers, Chapter 61 program releases, tax takings, conservation restrictions, etc. to ensure a multi-disciplinary, site-specific assessment by multiple town entities within the allotted period. Committees used to receive notification of 61A releases from Selectman who also asked for committee opinions on land purchases, but they report now that have not received these notifications in a long time.

OSIC intends to develop its land priority matrix as it implements the action plan of the 2009 OSRP update. There is interest in lands potentially available through release from Chapter 61 programs. As a first priority OSIC will research what it means to be prepared to exercise municipal Right of First Refusal on appropriate parcels and lay the groundwork for such.

Concurrently, OSIC will develop and maintain an up to date list of properties enrolled in the Chapter 61, 61A and 61B tax abatement programs and investigate their appropriateness for meeting OSIC priorities. OSIC also plans to

¹⁵ The American Farmland Trust, *The Economic and Fiscal Contribution Of Farm And Open Land In Sterling, Massachusetts*, 2009.

¹⁶ Per informal conversation between Jim French and Amanda Amory, email September 24, 2009.

assess the recommendations of the Affordable Housing Plan for compatibility with its goals and priorities as it implements the 2009 OSRP action plan.

At the 2009 Annual Town Meeting, residents voted to transfer Mudgett Orchard parcel(s) from the Board of Selectmen to the Conservation Commission following the BOS's recent consideration of the sale of the small parcel. The Conservation Commission also owns the Hall parcel next to the Sholan Park (town beach). The Conservation Commission has proposed connecting these parcels and Waushacum Overlook with a trail system and intends to seek funding through an application for a DCR recreational trails grant.

Access to DCR-DWSP lands for recreation purposes is a topic of great concern for many Sterling residents, and repeatedly appears in the Open Space and Recreation public opinion surveys. In 2003, DCR-DWSP published a new public access plan with an expiration date of 2013. There is a need to strike a balance between the passive recreation needs of Sterling's residents and the protection strategies for the state's public water supplies. OSIC will continue to work with DCR-DWSP, reviewing the public access plan and developing public education venues to provide a forum for discussing this perennial issue.

If regional trail connectivity planning continues, land trusts from Sterling, Leominster, and Lancaster will likely lead the effort. The group identified two potential parcel donations along the Wekepeke (and possible regional trail path), but timing, grantee and other details are not clear. A 33-acre parcel listed for a few years for \$425K (excluding house across the street)¹⁷ could potentially serve as a linkage possibility. If bylaws would allow and the Town likes the site, it seems that there may be creative, low cost ways to protect what looks like good farmland in perpetuity.

Since OSIC does not hold land on behalf of the town, the committee is in a unique position to offer objective assessment of the best approach for a given landowner's preferences, parcel characteristics, etc. Town ownership in fee may not always be the best approach to accomplishing protection strategies or recreational objectives. OSIC can offer assistance through discussions with landowners, referrals to other entities, distribution of brochures, or links to key resources on the Town website. OSIC intends to enhance its presence on the Town website as it implements the 2009 OSRP.

¹⁷ http://www.mlshomefinder.com/listing_detail.php?id=45248450

D. POPULATION CHARACTERISTICS

From 1970 to 2000, the regional population grew significantly, increasing by 23,596 or 27 percent, yet from 1990 to 2000, the growth rate slowed considerably, increasing by just 9,140, or 9.0 percent. Communities near Sterling also showed considerable growth in population (as listed in Table 3-1; see Lancaster and Leominster). Leominster showed the greatest growth in the region, increasing from 34,508 to 38,145 between 1980 and 1990, a difference of 3,637 or 10.5 percent; and to 41,303 in 2000, a difference of 3,158 people, or 8.3 percent. The population of Sterling increased from 5,440 to 6,481 between 1980 and 1990, a difference of 1,041 or 19 percent; and to 7,257 in 2000, a difference of 774, or 12 percent. Note that the growth rate for Sterling from 1990 to 2000 was considerably greater than that of the region. Shirley and Westminster were the most similar in size to Sterling in 1980. In the two decades that followed, the population of Shirley increased by 24 percent from 5,124 to 6,373, and that of Westminster by 44 percent from 5,139 to 7,395.

Proximity to I-190 and I-495, availability of land for development, and an over-heated housing market in the greater Boston region (until recently) make these residentially attractive communities. Many towns grew from agrarian roots in dairy and orchard farming. As these uses declined in the last three decades, much of the land became available for building. Also, the location of these towns on the perimeter of the Boston commuter shed made housing in these towns more affordable than in communities further east.

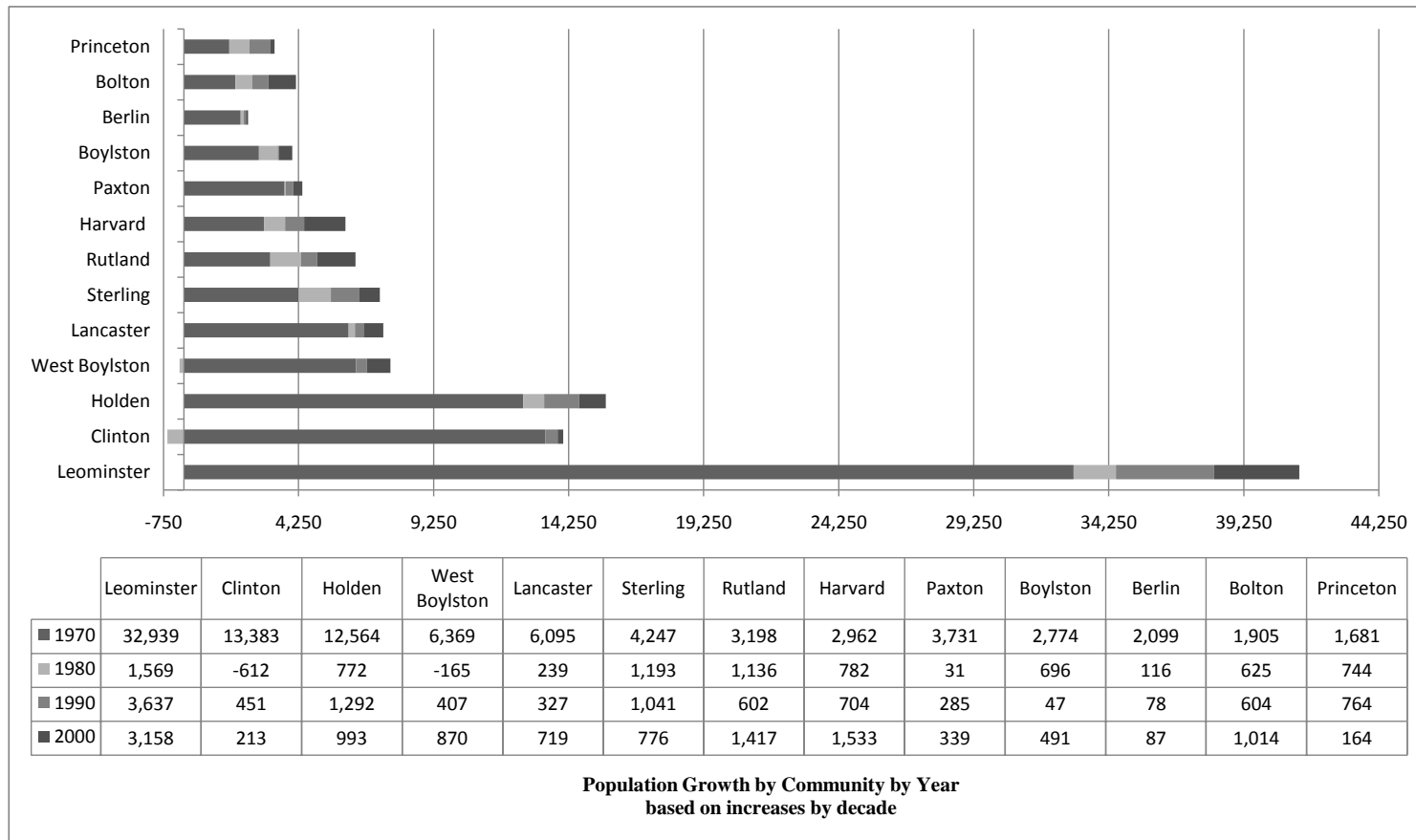
The rapid growth in the rural areas of the region occurred in a pattern of sprawl, consuming open space and agricultural lands, spoiling scenic vistas, affecting air and water quality, and exacerbating traffic problems. The sprawl pattern resulted in a separation of land uses into residential, commercial, and industrial classes, fragmenting communities and necessitating auto-oriented transportation systems. The rapid growth outpaced our ability as a region to comprehend its impacts. The beauty and charm of the quaint New England villages that grew from their proximity to churches by horse drawn carriage, in many cases could not be duplicated today because of the nature of our current planning laws, strategies and zoning practices. Many communities saw significant shifts in land use from agricultural, forestry, and other open space uses to residential, industrial, and commercial uses. The communities experiencing the most significant impacts of growth and development were coping with maintenance programs for roads, bridges, and utilities that had difficulty in keeping pace with population growth.

Table 3-1: Population in Sterling and Surrounding Communities from 1970 to 2000

	1970	1980	1990	2000	Change from 1990 to 2000	% Change 1990- 2000	Change from 1970 to 2000	% Change 1970- 2000
Leominster	32,939	34,508	38,145	41,303	3,158	8%	8,364	25%
Clinton	13,383	12,771	13,222	13,435	213	2%	52	0%
Holden	12564	13336	14628	15621	993	7%	3,057	24%
West Boylston	6369	6204	6611	7481	870	13%	1,112	17%
Lancaster	6,095	6,334	6,661	7,380	719	11%	1,285	21%
Sterling	4,247	5,440	6,481	7,257	776	12%	3,010	71%
Rutland	3198	4334	4936	6353	1,417	29%	3,155	99%
Paxton	3,731	3,762	4,047	4,386	339	8%	655	18%
Boylston	2774	3470	3517	4008	491	14%	1,234	44%
Princeton	1681	2425	3189	3353	164	5%	1,672	99%
Total	86,981	92,584	101,437	110,577	9,140	9%	23,596	27%

Source: US Census 1970, 1980, 1990, 2000

Figure 3-1: Population in Sterling and Surrounding Communities from 1960 to 2000



Source: US Census 1970, 1980, 1990, 2000

Figure 3-1 illustrates the proportional growth in populations of Sterling and surrounding communities by graphing the increases over the 1970 populations for each decade. Note that both West Boylston and Clinton declined in population from 1979 to 1980. Populations in Harvard and Lancaster are excluding the De-vens military populations.

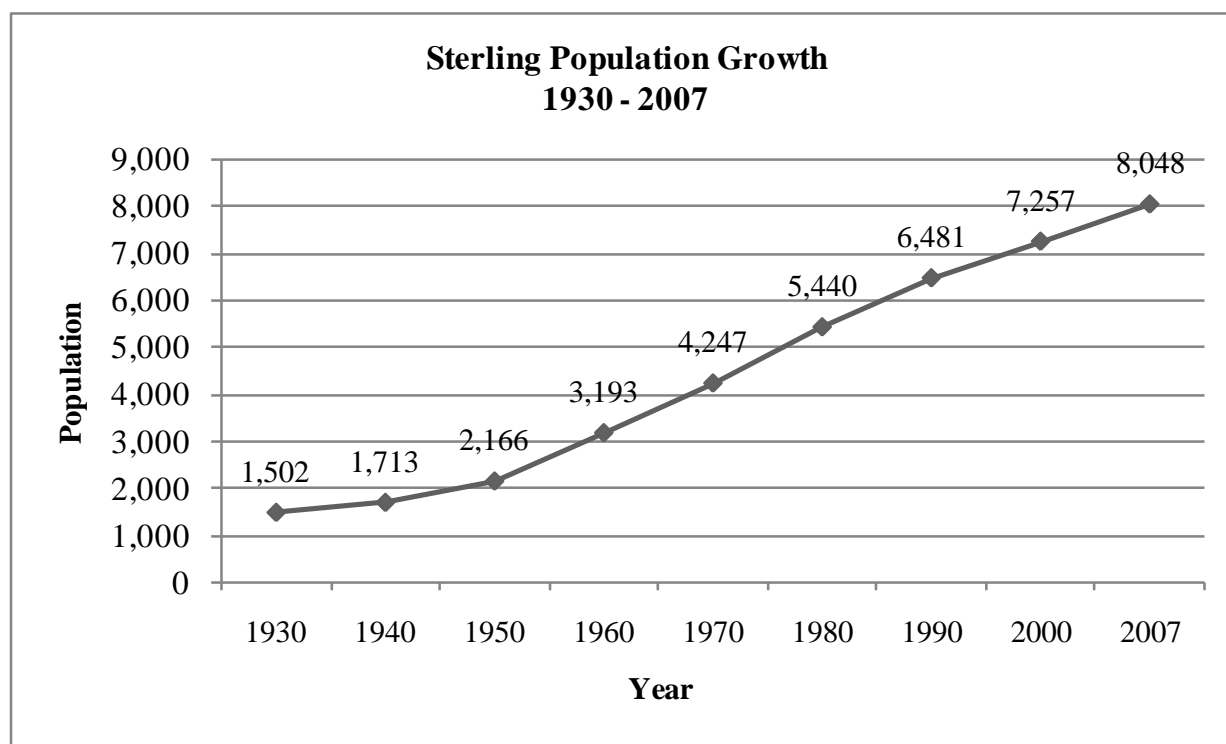
While the population of Sterling increased 71 percent between 1970 and 2000, the 47.4 percent growth during the 1950's was by far the most significant period of growth (see Table 3-2, which summarizes 70 years of Sterling population data). The growth rate increased rapidly between 1950 and 1960, from 2,166 to 3,193, at an average annual growth rate of five percent.¹⁸ After 1980, the rate of growth began to level off, as shown in both Table 3-2 and Figure 3-1. Between 1960 and 1980, the population growth slowed to an average annual rate of three percent, from 3,193 to 5,440. Between 1980 and 1990, the population grew by 1,041 to 6,481, at an average annual growth rate of nearly two percent, and by 2000 the population grew to 7,257, at an average annual growth rate of just over one percent.

Table 3-2: Historic Population Trends in Sterling (Census data)

Year	1930	1940	1950	1960	1970	1980	1990	2000	2007
Population	1,502	1,713	2,166	3,193	4,247	5,440	6,481	7,257	8,048
Increase	--	211	453	1,027	1,054	1,193	1,041	776	791
Percent	--	14%	26.4%	47.4%	33%	28.1%	19.1%	11.9%	11%

Source: US Census, 1930-2000, Table from the Town of Sterling's 2004 Community Development Plan (EO418), compiled by MRPC.

Figure 3-2: Sterling Population Growth Curve



Source: US Census, Plot from the Town of Sterling's 2004 Community Development Plan (EO418), compiled by MRPC.

¹⁸ Average annual rate of growth is the rate of growth in population over a decade divided by the number of years in the decade. It illustrates the rate of change in the growth rate over time.

Since 2000, the population has grown to 8,048, a increase of 791 residents and an annual average rate of growth of about 1.6 percent(see Table 3-3), a much slower pace than that of the post World War II era, and considerably slower than the rates in the 1980's and 1990's.¹⁹ It is noteworthy that this significantly exceeds the population projections for Sterling in 2010 and 2020 shown in Table 3-5. These most recent figures reflect significant changes in the housing economy, diminishing availability of buildable land and the inevitability of future buildout. Population density in 1983, based on a town census, was 183 persons per square mile. By the 1990 census, density had grown to 207 persons per square mile. As of 2007, population density was 245 persons per square mile, representing an estimated 33.8 percent increase in population density since 1983.²⁰

Table 3-3: Recent Population Trends in Sterling (Town data)

Year	2001	2002	2003	2004	2005	2006	2007
Population	7,425	7,559	7,858	7,935	8,005	8,020	8,048
Increase	--	134	299	77	70	15	28
Percent	--	1.8%	4.0%	1.0%	0.9%	0.2%	0.3%

Source: Office of The Town Clerk, Sterling MA, Q4-2007.

From 2003 through 2007 the overall school enrollment has been almost stable.²¹ From 2003 through 2009 the total enrollment in the school district has fluctuated slightly, differing by a maximum of 40 students up or down across the years. These fluctuations are apparent at grade level as well, as students move from one grade level to the next across the years (See Table 3-4 and Figure 3-2). The enrollment data revealed a slight downward trend in elementary school students, and a more pronounced downward trend in middle school students in the 2003 to 2007 timeframe. Generally, students enrolled in the Houghton Elementary School account for 39 to 40 percent of the total enrollment each year. Enrollment at Chocksett Middle school has dropped from 37 percent in 2003 and 2004, to an average of 32 to 33 percent since then. Enrollment at the Wachusett Regional High school increased by 32 percent, from representing roughly 23 percent of total Sterling enrollment in 2003 and 2004 to 28 to 30 percent in subsequent years. This may reflect an increase in the older school age population, or an age-cohort that is larger than others matriculating through the school system. It may also reflect greater retention in the high school system. Factors such as school choice, enrollment in regional technical schools, and dropout rates all affect enrollment rates and vary year to year.

The relatively stable number of schoolchildren at a time when the town's population continues to grow may indicate smaller families, an increase in the number of families without children, and families whose children have grown and moved away. These trends are expected to continue, and the Town should prepare immediately for the needs of an increasingly middle aged and elderly population.

Table 3-4: Sterling Foundation Enrollment in Wachusett Regional School District Sterling

Fiscal/School Year	2003	2004	2005	2006	2007	2008	2009
Houghton Elementary (k-4)	522	512	519	495	503	511	519
Chocksett Middle (5-8)	481	466	417	426	425	426	416
Wachusett Regional High School (9-12)	284	290	371	394	357	371	376
Total Enrollment	1,287	1,268	1,307	1,315	1,285	1,308	1,311

Source: Massachusetts Department of Education Enrollment by District/School/Grade

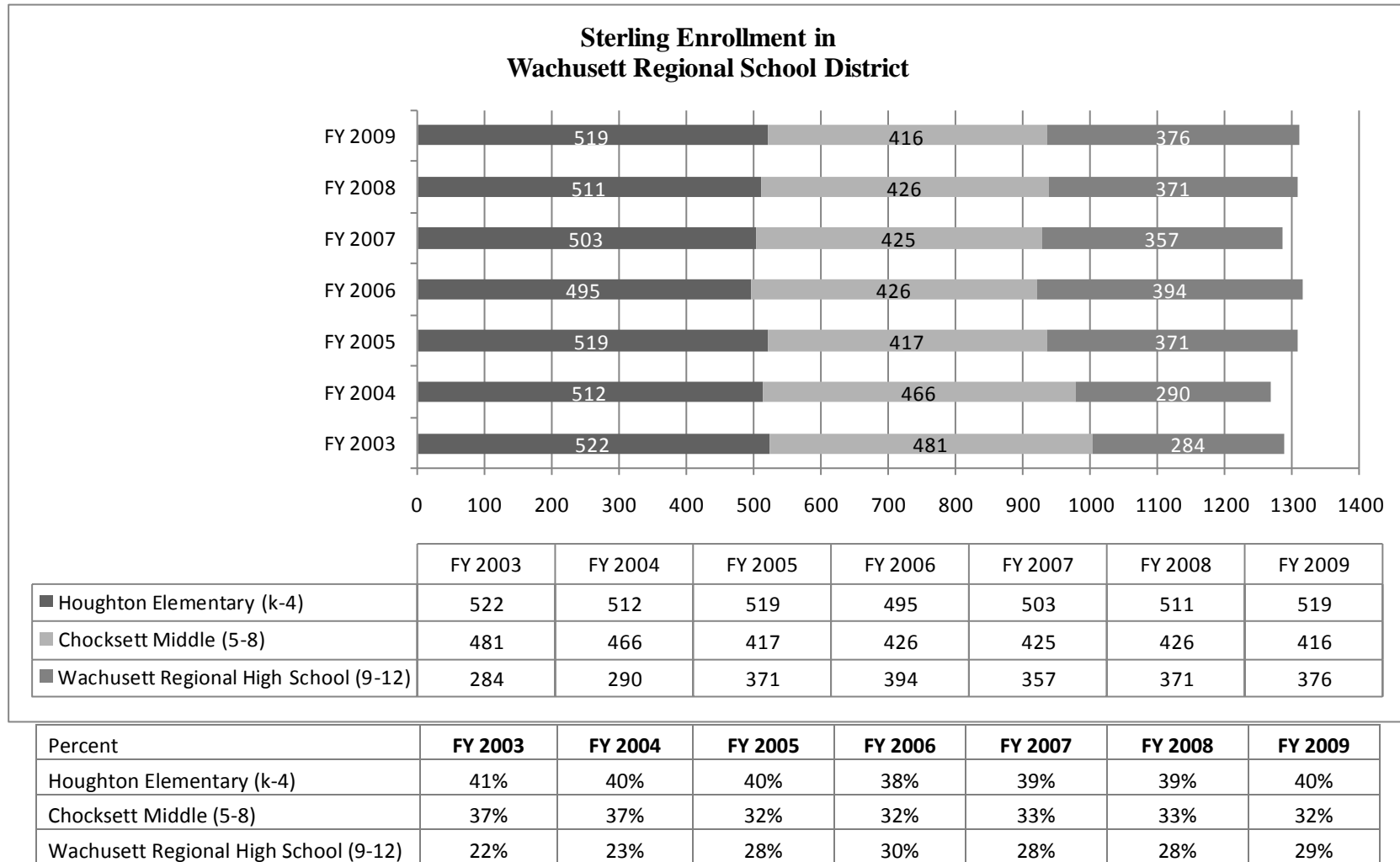
Source: Wachusett Regional School District Chapter 70 Regional District Summaries, FY 2005 - FY 2009

¹⁹ as determined from data reported by the Town Clerk

²⁰ 2007 data based on verbal communication with Town Clerk, Town of Sterling, Q4-2007.

²¹ Personal communication with the Office of the Superintendent of Schools, Wachusett Regional School District, Q4-2007.

Figure 3-3 Sterling Foundation Enrollment in Wachusett Regional School District



In the 2002 OSRP, the Sterling Youth Sports Committee (SYSC) identified a need for an athletic complex serve the student population. The SYSC represents eight sports organizations that were competing for game and practice time on the existing fields. At that time, teams used the fields at Griffin and Muddy Pond Roads seven days per week, all day and into the evening, serving a population of well over 1,200 youths. Over-use in the fall forced reseeding each spring. Sterling Youth Soccer and Pop Warner Football were the two largest organizations during the fall season, serving 550 and 400 participants respectively. In addition, Sterling Softball and Sterling Babe Ruth, serving 125 and 75 participants respectively, had to share their ball fields with the Soccer League, although not designed for soccer use. Mountain Club Soccer, which plays in the spring, could not use the playing fields due to overuse in the fall. They sought any field they could find to practice, and many teams sought fields out of town.

SYSC had determined that they needed a site of approximately 15 acres to develop a soccer field to relieve the pressure on the existing fields and satisfy growth in the existing organizations. They anticipated that the site would allow for the establishment of new recreational activities, (such as a skateboard park, a deck hockey and ice hockey rink, walking paths, additional softball fields, and a playground). It would also allow the Sterling Babe Ruth to install an outfield fence, and permit the softball and little league organizations to use their fields in the fall season.

Since 2002, the Recreation Department has improved its scheduling of existing recreation facilities and tightened its use policies, which seems to have alleviated the need for a new soccer field identified in the previous plan (2002). Groups still tend to reserve fields and not use them. Such practice may relate to low usage fees (so groups simply block out time “just in case” they need a field. The Town revised its maintenance practices to make the Chocksett Athletic fields more durable, though increased use of fertilizer may have precipitated recent algal blooms at the small pond near the fields. Management practices employed at the fields should address environmental concerns for the pond, and could include creating flow diversion barriers for areas where fertilizer is used. The Agricultural Commission may have suggestions for improving the soils for growing better turf.

There could potentially be a future need for soccer fields. Critical evaluation of school enrollment data and sports enrollment statistics, as well as regional availability of sports programming, will enable the Recreation Department to assess future need. In the current economy, many schools are now charging fees for participation in athletics, including the Wachusett Regional School District. Regionally, non-school leagues are available at Devens and the town of Lancaster. With the release of the 2010 census, the Town will need to analyze potential shifts in demographic and enrollment patterns at the school district, and the athletic and recreation programs.

The 2007 public opinion survey identified a remaining need for community playgrounds, a skateboard park, and a park for exercising and socializing dogs. In January of 2005, a group of enthusiastic Sterling residents formed the Sterling Play Area and Recreation (sub) Committee (SPARC) to work as a sub-committee with the Recreation Department to design and raise funds for the development of an outdoor community park. The group investigated available properties, canvassed families to determine their physical needs, and set about designing a versatile family oriented, handicap-accessible community playground, incorporating interesting play structures, a fenced play area, open space, age appropriate swings, space for groups and picnics, walking paths, sitting areas, a pavilion and natural elements (trees, shrubs, flowers, and plants). The Sterling Greenery Community Park is easily accessible from Muddy Pond Road and Griffin Road athletic field, and is open to the public daily from dawn to dusk.²² It is also a short walk to DCR’s Muddy Pond and Stillwater River Canoe Launch.

The Massachusetts Institute for Social and Economic Research (MISER) of the University of Massachusetts at Amherst projected population growth trends to continue.²³ MISER used a cohort-component projection model using historical population estimates from the US Census Bureau and its own intercensal population estimates. The projections factor in vital statistics of births and deaths from the Massachusetts Department of Public Health (DPH), international immigration data from Immigration and Naturalization Services (INS), and domestic migration data provided by both the Internal Revenue Service (IRS) and the U.S. Census Bureau. The projections are strictly demographic projections. The methodology does not use economic variables or land use suitability data. Thus the model is a trends-extended estimate without modifying constraints, and it takes a relatively conservative approach.

The age distribution data from the US Census for 1980, 1990, and 2000, coupled with the MISER population projections for 2010 and 2020, illustrate an aging trend that reflects the general demographics of the baby boom generation, the subsequent dearth of babies (known as Generation X), and the boomlet that represents the children of the “Baby Boomers”. (See Table 3-5)

²² For a complete description of the project and process, see Section 4

²³ See www.umass.edu/miser/ for more information. The most recent MISER data available is dated 12/10/2003.

In general, the 1980 age distribution showed the greatest percentages of the population were between the ages of 15 and 24, representing those who were born from 1955 to 1964. The oldest were born in the 1890's; they represented only a fraction of a percent of the population. By 1990, the largest age groups had shifted to those between the ages of 25 and 34 and their numbers represented a still greater share of the total population. This is in part because older generations had either left town or were no longer living, and in part because young families were moving to the town. By 2000, the age groups with the greatest percentage of the population had shifted to those between the ages of 35 and 44, still representing those born from 1950 to 1964.

Twenty years behind this "Baby Boom" wave is a second wave of increased population: those born between the years of 1981 and 1996. As they reach adulthood, they account for an increasing share of the population, potentially indicating young adults seeking affordable homes in the region as well as those remaining in their parents' homes because of the lack of affordable homes in the region. For each decade, the population projections all show low numbers relative to other age brackets, most likely due to college age residents leaving for school.

The historical and projected shifts in the population distribution indicate a population that, while growing, is also aging in place, and/or a town that is desirable to older adults (See Figure 3-4 and Table 3-5 depict). Figure 3-4 maps the age distribution numbers and projected estimates as points on a population distribution curve for each decade. From a town planning perspective, these data point to the need for the Town of Sterling to begin immediate planning and programming to meet the needs of this growing middle-aged and elderly population. Surveys for proposed elderly services should include today's middle-aged residents whom this analysis suggests will be the consumers of such services for at least the next 20 years. Plans for increased programs and services must also address this longitudinal issue and consider the interest and service needs of both today's elders and the emerging groups.

These curves show a bulge in the age cohorts that shifts to the right with each passing decade, finally leveling off after age 80 for all decades. Note how the age distribution peaks shift to the right with each passing decade. Note the significant trough that follows this bulge, and the subsequent lesser bulge that represents the "children of the baby boom" of child rearing age. Note also that the tail end of the baby boom generation are now passing out of child bearing age, after deferring having families until after they had established careers. The shift of the age distribution curve describes a population that is aging in place, or perhaps to a town that is affordable only to those who have significantly higher incomes, and greater equity investments.

Table 3-5: Population Projections by Age Group for the Town of Sterling

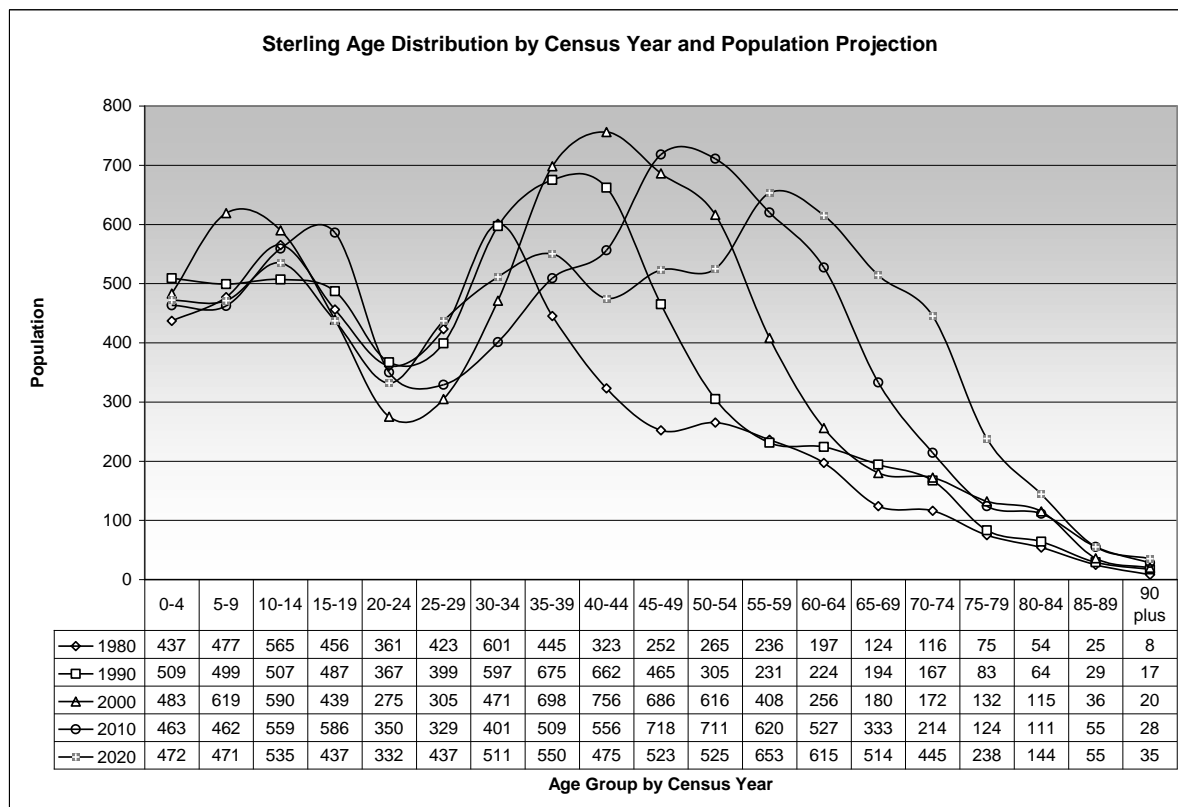
Age Group	Census 1980	Census 1990	Census 2000	MISER Baseline Mid-Level Projections		2000-2010 Forecast Change %	2000-2020 Forecast Change %
				2010	2020	2000 to 2010	2000 to 2020
0-4	437	511	483	463	472	-4%	-2
5-9	477	496	619	462	471	-25%	-24
10-14	565	507	590	559	535	-5%	-9
15-19	456	493	439	586	437	33%	0
0-19	1,935	2,007	2,131	2,070	1915	-3%	-10
20-24	361	356	275	350	332	27%	21
25-29	423	405	332	329	437	-1%	32
30-34	601	592	444	401	511	-10%	15
35-39	445	677	659	509	550	-23%	-16
40-44	323	674	795	556	475	-30%	-40
20-44	2,153	2,704	2,505	2,145	2,305	-14%	-8
45-49	252	458	791	718	523	-9%	-34
50-54	265	307	511	711	525	39%	-3
55-59	236	220	408	620	653	52%	60
60-64	197	223	256	527	615	106%	140
45-64	950	1,208	1,966	2,576	2316	31%	18
65-69	N/A	205	187	333	514	78%	175
70-74	N/A	157	165	214	445	30%	175
75-79	N/A	86	162	124	238	-23%	47
80-84	N/A	64	85	111	144	31%	69
85+	N/A	50	56	83	90	48%	61
65+	402	562	655	865	1431	32%	118
Total	5,440	6,481	7,257	7,656	7,967	5.5%	10

Sources: Massachusetts Institute for Social and Economic Research (MISER), 12/10/2003
Profiles of General Demographic Characteristics 2000, May 2001, 2000 Census of Population and Housing, Massachusetts.

Note that the actual growth rate both in percentages and actual numbers reported by the Sterling Town Clerk surpassed the MISER 2010 predictions by the year 2003 (see above); since the MISER projection figures are the best available, they are used to illustrate the trend. Overall, the conservative MISER projection anticipated a growth rate of 5.5 percent by 2010, or an additional 399 residents. As of 2007, the actual growth rate was 11 percent, and an additional 791 residents, or nearly double the projection. MISER anticipated decreases by 2010 for all age cohorts between 0 and 19 and for adults between 25 and 49, and increases in young adults aged 20-24 and adults over 50; and predicted that growth was most likely for empty nesters between 50 and 70 years of age. At the time of this writing, age distribution data for 2007 was unavailable; it would be useful to explore this distribution to see what the demographic housing, open space, and recreation needs are for the Town.

Figure 3-4 illustrates an increasing elderly population that alludes to greater needs for older residents. Some will need housing tailored to accommodating disabilities that come with the aging process; others will simply need smaller homes that are easier to manage.

Figure 3-4: Sterling Age Distribution by Census Year and Population Projection²⁴



The demographic data show significant growth in the population of elderly residents as the baby boom generation reaches retirement, and the MISER projections extend the trend. Between 1990 and 2010, the population of individuals over the age of 60 is expected to increase by 481 to a total of 1,392, a 53 percent increase. By 2020, the anticipated growth in this population will increase by another 654 individuals to a total of 2,046, or another 47 percent. These statistics imply that Sterling will need to consider the recreation needs and community needs of a much older population. OSIC supports the interest in Town for development of a senior center in a centrally located area that provides for community needs and supports intergenerational activities, with handicap access to outdoor environments.

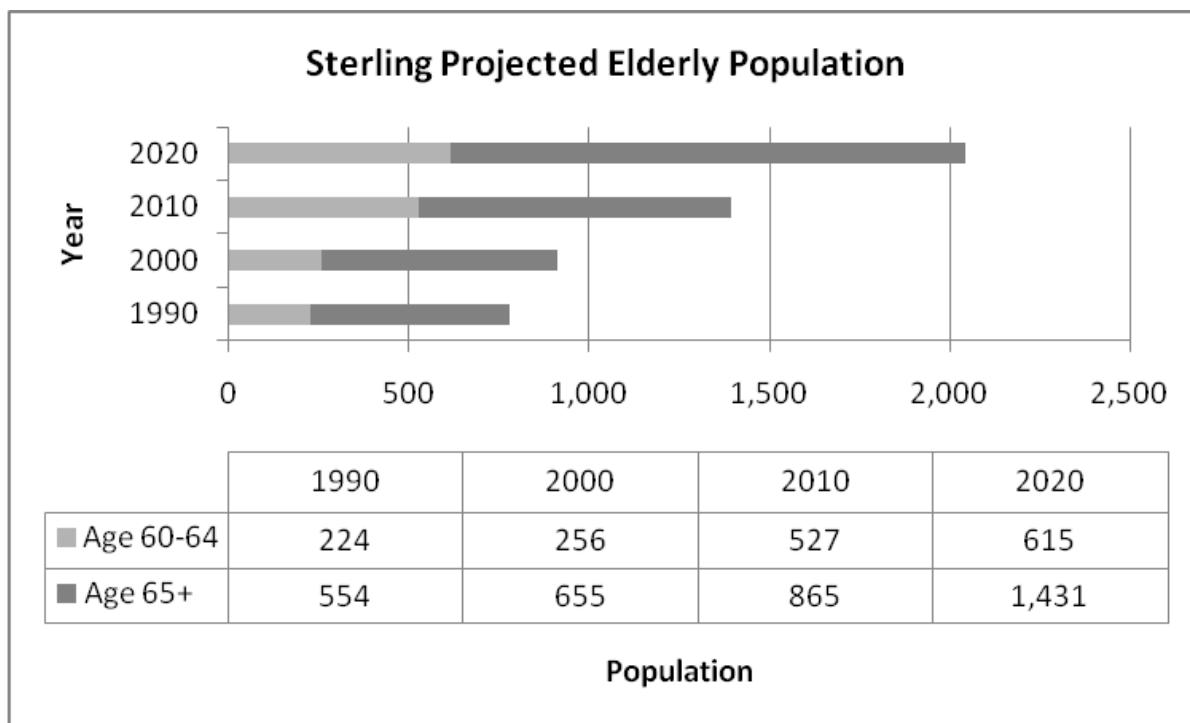
Table 3-6: Sterling Projected Elderly Population

	1990	2000	2010	2020	Change 1990-2000	Change 2000-2010	Change 2000-2020
Age 60-64	224	256	527	615	14.3%	105.9%	140.2%
Age 65+	554	655	865	1,431	18.2%	32.1%	118.5%
	778	911	1392	2046	17%	53%	47%

Source: The Research Unit, Executive Office of Elder Affairs,
based on MISER 12/2002 projections.

²⁴ Plot from the Town of Sterling's 2004 Community Development Plan (EO418), compiled by MRPC.

Figure 3-5: Sterling Projected Elderly Population



Source: The Research Unit, Executive Office of Elder Affairs, based on MISER 12/2002 projections.

The 1990 census reported that Sterling had a *median household income* of \$49,345 and a *median home value* of \$171,400. In 2000, Sterling the *median household income* had risen to \$67,188. As of 2007, the medium household income had risen to \$86,996, a change of nearly 30 percent. Sterling reported a housing stock of 2,573 houses, an occupancy rate of 97.6 percent and a vacancy rate of just 2.4 percent. In contrast, the *median home value* for Sterling in 2000 was \$195,600, and the median income was equivalent to 34 percent of the median home value. By 2007, the median household income had risen to \$86,996, an increase of 29.5 percent, whereas the median home value had increased to \$394,081, an increase of 101.5 percent, and the median income became equivalent to 22 percent of the median home value, as shown in Table 3-6 and Figure 3-5.

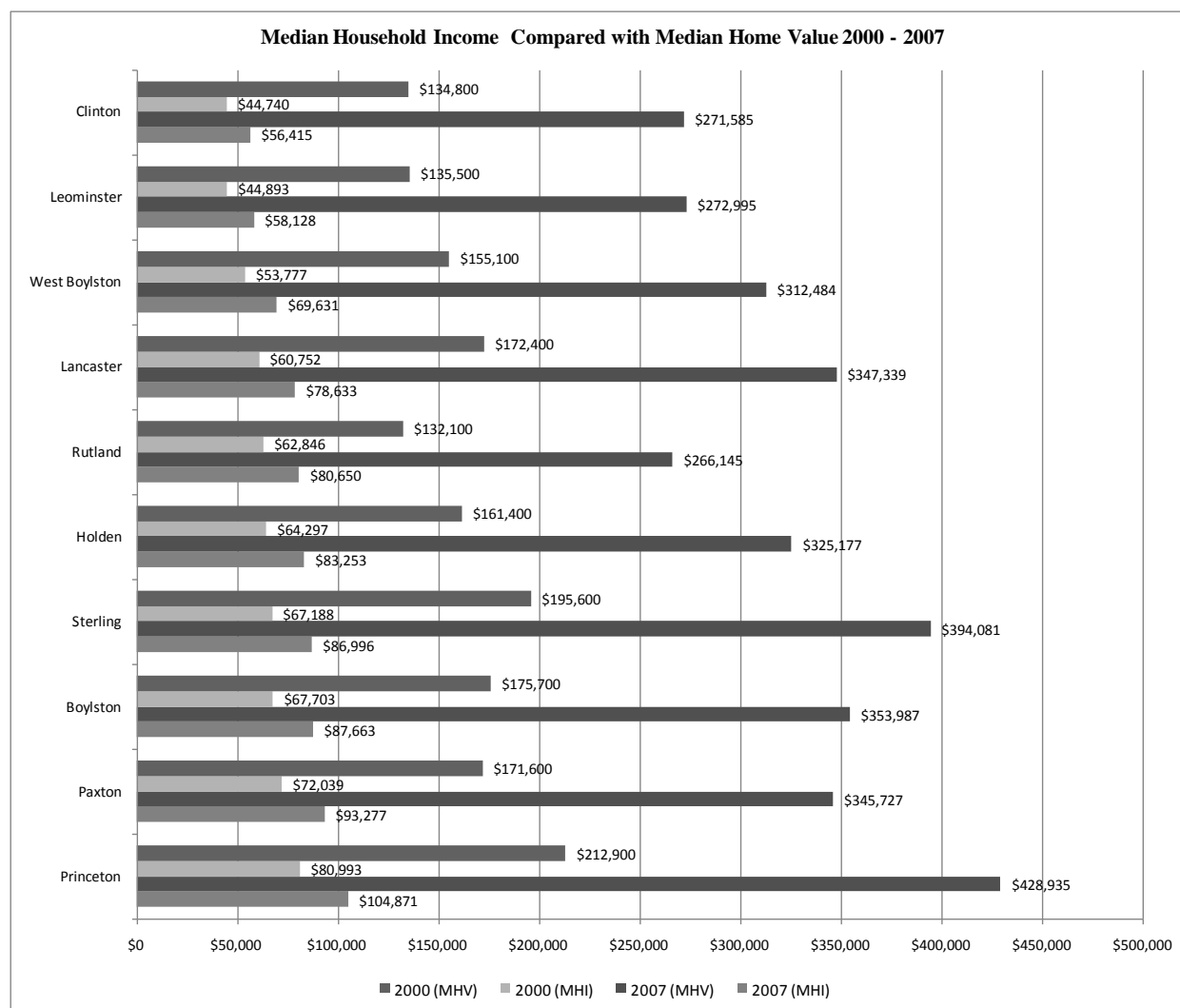
Similar trends occurred in the neighboring communities and in the communities of the Wachusett Regional School District. Note that while the median household income increases seem significant, they appear to be small, incremental changes when contrasted with the spending power that was lost due to the very significant increases in median home value. This illustrates the widening need for the creation of affordable housing,

Table 3-6: Median Household Income and Median Home Value Trends and Comparisons

Community	Median Household Income			Median Home Value			Income/Home Ratio	
	2000 (MHI)	2007 (MHI)	Percent Change	2000 (MHV)	2007 (MHV)	Percent Change	2000	2007
Princeton	\$80,993	\$104,871	29.48%	\$212,900	\$428,935	101.5%	38%	24%
Paxton	\$72,039	\$93,277	29.48%	\$171,600	\$345,727	101.5%	42%	27%
Boylston	\$67,703	\$87,663	29.48%	\$175,700	\$353,987	101.5%	39%	25%
Sterling	\$67,188	\$86,996	29.48%	\$195,600	\$394,081	101.5%	34%	22%
Holden	\$64,297	\$83,253	29.48%	\$161,400	\$325,177	101.5%	40%	26%
Rutland	\$62,846	\$80,650	28.33%	\$132,100	\$266,145	101.5%	48%	30%
Lancaster	\$60,752	\$78,633	29.43%	\$172,400	\$347,339	101.5%	35%	23%
West Boylston	\$53,777	\$69,631	29.48%	\$155,100	\$312,484	101.5%	35%	22%
Leominster	\$44,893	\$58,128	29.48%	\$135,500	\$272,995	101.5%	33%	21%
Clinton	\$44,740	\$56,415	26.10%	\$134,800	\$271,585	101.5%	33%	21%

Source: US Census data as compiled by City-Data.com <http://www.city-data.com/city/Massachusetts.html>

Figure 3-6: Comparisons of changes in Median Household Income and Median Home Values 2000 to 2007



Prices and sales of both new and existing homes in Worcester County declined in 2006 and 2007. The effect of the recent downturn on housing prices in general, and specifically in Sterling, is unknown as of 2008. On June 23, 2008, the Massachusetts Realtors Association reported the mean selling price for a single-family home in Massachusetts fell in May 2008 by 9.2 percent to \$322,500 down from \$355,000 in May 2007. The same report also noted that the volume of sales had dropped 10.1 percent over that of May 2007.²⁵

Still these statistics indicate that *affordable housing* for low- to moderate-income families remains increasingly out of reach. In 2000, low-income for a family of four in Sterling was \$46,700 per year, and a very low income was \$29,200; a poverty level income was \$17,500 or less. By contrast, the Department of Housing and Community Development (DHCD) has determined that the affordable purchase price for a house for a middle-income family would be about \$285,600, based upon an income of \$87,600 per year. Affordable housing eligibility is based upon an income of 80 percent of the median household income. Affordable rent for a similar family would be about \$1,460 per month. On an annual income of \$46,700, a family could realistically only afford to spend \$98,000 for a home, with \$23,500 down payment, and a monthly payment of \$700.^{26 27} Typical low-income families would include young single mothers and elderly on a fixed retirement income that is not keeping pace with inflation. Typical moderate-income families would be those who work for towns, school systems, or public services, or in low-tech manufacturing jobs or retail services.

2. Environmental Justice Populations

Of the Commonwealth's 351 cities and towns, 108 have an Environmental Justice (EJ) population, 20 municipalities meet all four of the EJ population criteria. Sterling does not meet any state defining criteria of Environmental Justice communities (based on the 2000 U.S. Census Block Data). Neighboring communities Clinton, Lancaster, Leominster, and West Boylston do meet some of the criteria. Princeton and Holden do not.²⁸ (see EJ_Central map in Appendix A)

1. Households earn 65% or less of the statewide household median income; or
2. 25% or more of the residents are minority; or
3. 25% or more of the residents are foreign-born; or
4. 25% or more of the residents are lacking English language proficiency

From 1990 to 2000, there was a 9 percent increase in population in the Sterling greater region, and a 28 percent increase in the number of individuals below the poverty level (from 5,084 to 6,502, a difference of 1,418, as shown in Table 3-7). This translates to a 0.9 percent increase in *poverty rates* (the percent of population impoverished). The *poverty rates* declined in Boylston, Clinton, Lancaster, Sterling, and West Boylston, but increased in Holden, Leominster, Paxton, Princeton, and Rutland. The rates in Sterling decreased from 4.6 percent of the population in 1990 to 2.9 percent in 2000 and the estimated number of impoverished people decreased by 86 (or 10.9 percent). Both the region and the Town were significantly below the State averages of 8.6 percent in 1990 and 9.3 percent in 2000. However, even with a decline in poverty rates, housing prices may still deter those with moderate to low income from buying or renting in Sterling. This indicates an ongoing need for the development of more affordable housing units in Sterling, particularly those suitable for an aging population.

In line with national trends, the regional population is becoming more diverse in its racial and ethnic makeup. Minority racial and ethnic groups continue to be one of the fastest growing population segments in the region. As noted in Table 3-8, the minority population increased by 103 residents, a 271 percent increase, between 1990 and 2000. Still, the minority population of the town is slightly less than 2 percent of total population. Three more communities also saw large growth rates in their minority populations, Princeton (148 percent), Boylston (100 percent), and Rutland (111 percent). As with Sterling, these growth rates still yielded small percentages of the overall populations in each community. Proportionally, the communities with the highest numbers of minority residents are Lancaster (15.5 percent), Leominster (12.9 percent) and Clinton (11.8 percent), which surround Sterling on three sides. Over half of the region's minority residents reside in Leominster (See Figure 3-7).

²⁵ <http://www.marealtor.com/content/> as of 6/23/2008

²⁶ Department of Housing and Community Development Revised Fiscal Year 2002 Income Limits for HUD Programs.

²⁷ Fleet Mortgage Calculator, <http://mortgagecenter.fleet.com/> [no longer an active website as of 6/15/08]

²⁸ http://www.mass.gov/mgis/ej_cities-towns.pdf

Table 3-7: Regional Poverty Rates

Community	Population		Poverty Level			
	1990	2000	1990 Number Below	1990 Percent below	2000 Number Below	2000 Percent below
Boylston	3,517	4,008	130	3.70%	111	2.77%
Clinton	13,222	13,435	980	7.41%	949	7.06%
Holden	14,628	15,621	271	1.85%	479	3.07%
Lancaster	6,661	7,380	306	4.59%	237	3.21%
Leominster	38,145	41,303	2,713	7.11%	3,889	9.42%
Paxton	4,047	4,386	10	0.25%	74	1.69%
Princeton	3,189	3,353	59	1.85%	148	4.41%
Rutland	4,936	6,353	121	2.45%	206	3.24%
Sterling	6,481	7,257	299	4.61%	213	2.94%
West Boylston	6,611	7,481	195	2.95%	196	2.62%
Region Total	101,437	110,577	5,084	5.0%	6,502	5.9%

Source: US Census, 1990 and 2000

Source: Executive Office of Labor and Workforce Development (EOLWD) June 2008, www.mass.gov/eolwd

Figure 3-6: Regional Poverty Numbers by Census Year

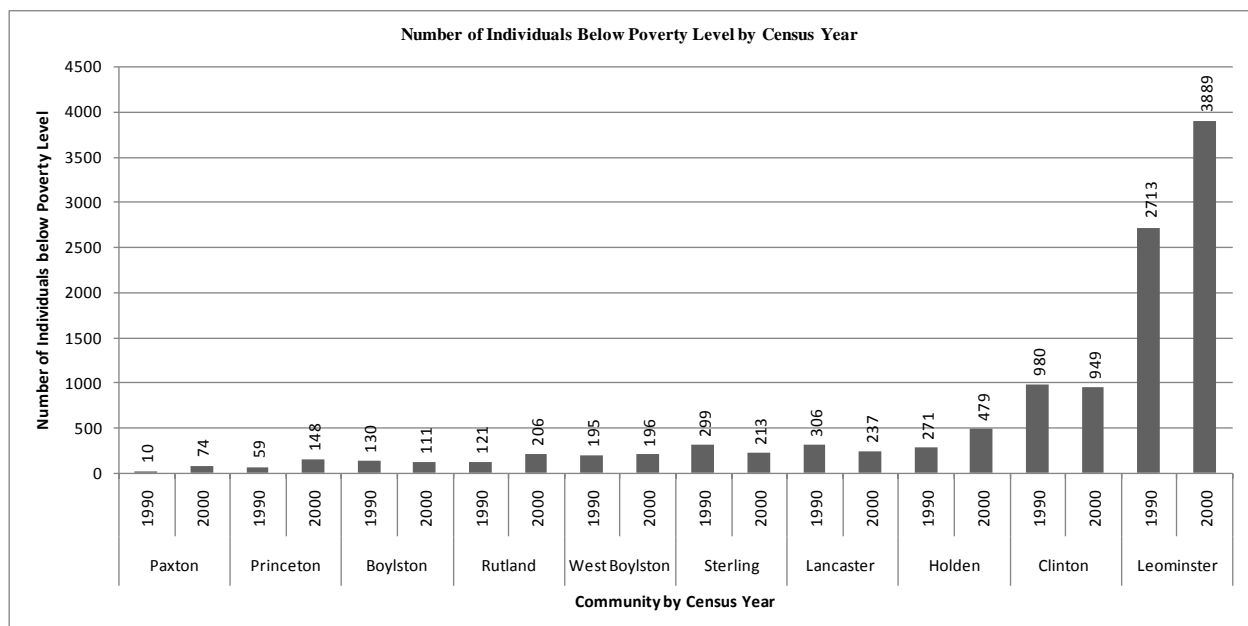
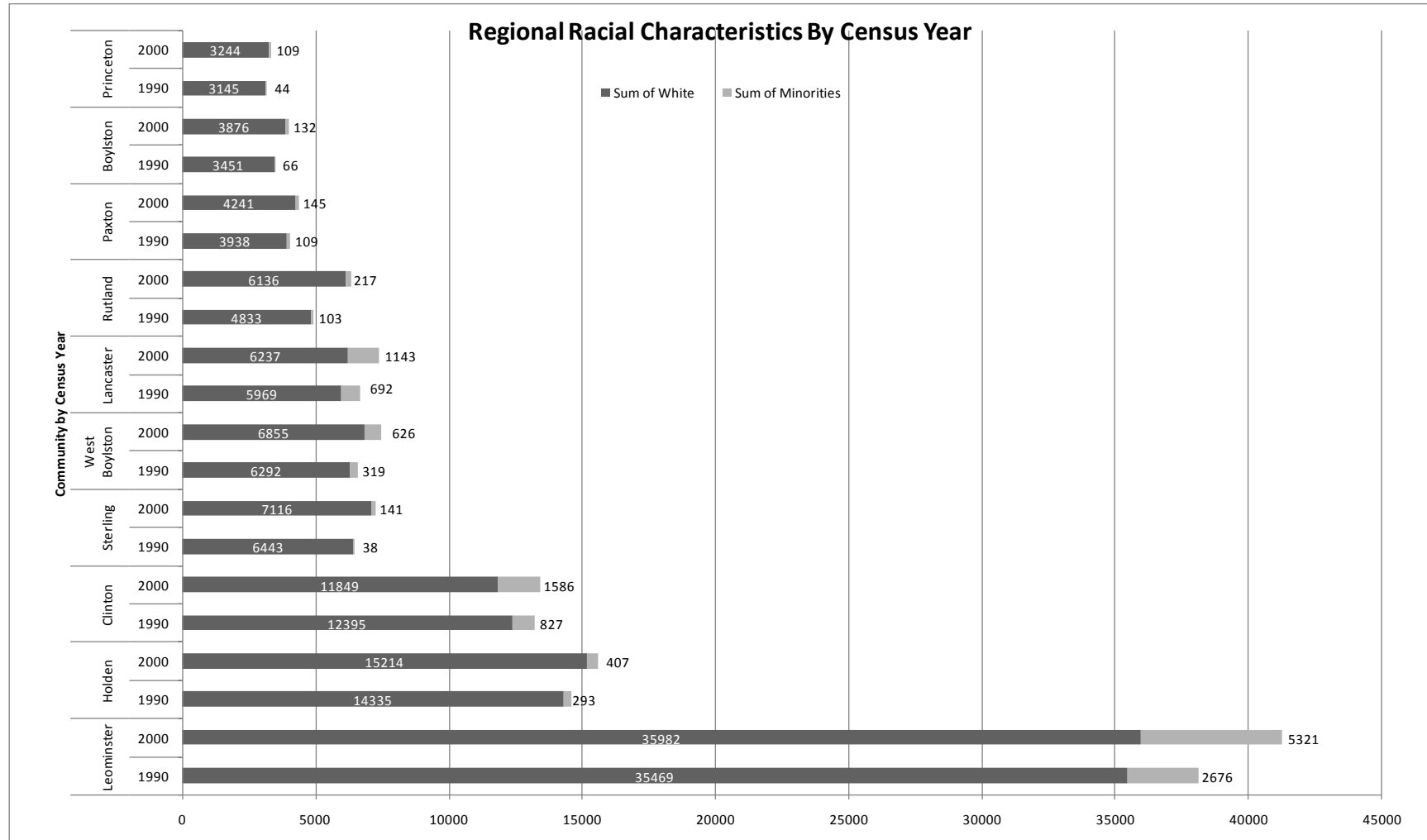


Figure 3-7: Regional Racial Characteristics by Census Year 1990 and 2000



Sources: US Decennial Census, 1990 and 2000, Massachusetts Department of Public Health

Table 3-8: Regional Racial Characteristics 1990 and 2000

Community	1990				2000			
	Total	White	Minorities	Percent	Total	White	Minorities	Percent
Sterling	6,481	6,443	38	0.6%	7,257	7,116	141	1.9%
Holden	14,628	14,335	293	2.0%	15,621	15,214	407	2.6%
Boylston	3,517	3,451	66	1.9%	4,008	3,876	132	3.3%
Paxton	4,047	3,938	109	2.7%	4,386	4,241	145	3.3%
Princeton	3,189	3,145	44	1.4%	3,353	3,244	109	3.3%
Rutland	4,936	4,833	103	2.1%	6,353	6,136	217	3.4%
West Boylston	6,611	6,292	319	4.8%	7,481	6,855	626	8.4%
Clinton	13,222	12,395	827	6.3%	13,435	11,849	1,586	11.8%
Leominster	38,145	35,469	2,676	7.0%	41,303	35,982	5,321	12.9%
Lancaster	66,61	5,969	692	10.4%	7,380	6,237	1,143	15.5%
Total	101,437	96,270	5,167	5.1%	110,577	100,750	9,827	8.9%

Sources: US Decennial Census, 1990 and 2000, Massachusetts Department of Public Health

The 2000 Census indicates the number of males and females is evenly divided in the Sterling population. It also indicates that the level of educational attainment is increasing. In 1990, 25.9 percent of town residents held high school diplomas, 19.3 percent bachelor's degrees, and 10.6 percent graduate or professional certificates. In 2000, these percentages were 20.6 percent high school, 23.6 percent bachelors, and 12.2 percent graduate or professional certificates, an increase of 10.89 percent in this ten year period.

Increasingly the Town is becoming a bedroom community. According to the 1990 census, over 87 percent of Sterling commuters drove alone to work. About 472 Sterling residents worked in Sterling. The balance of workers, 2,667 residents, commuted to other towns or cities for their employment. The top five work destinations were Worcester, West Boylston, Clinton, Marlborough, Leominster, and Lancaster, which are all within an average travel time of 24 minutes. About 446 residents commuted south for their employment, another 424 drove east, and only 208 commuted to distant towns within the MRPC region. As of this writing OSIC did not have the journey to work information for the 2000 census.

In 1990, a total of 3,139 residents were employed, roughly 48 percent of the population. In 2000, Sterling had a working age population of 5,262, roughly 73 percent of the total population. Of these people, a total of 3,725 are considered to be part of the *labor force*, an increase of 19 percent, or 586 employed residents, over the 1990 work force. As shown in Table 3-9, the Sterling labor force grew by 256 individuals between 2000 and 2007, an increase of just over 6 percent. For the period between 2001 and 2007, the Sterling Town Clerk reported a total population growth rate of 8.4 percent. Thus, more than 28.5 percent of the population increase is not of working age.

Table 3-9: Town of Sterling Annual Labor Force and Unemployment Rates 2000 thru 2007

(2005 Population 7,770)

Year	Labor Force	Employed	Unemployed	Unemployment Rate
2000	4,210	4,123	87	2.1
2001	4,294	4,167	127	3
2002	4,399	4,186	213	4.8
2003	4,438	4,215	223	5
2004	4,433	4,231	202	4.6
2005	4,417	4,223	194	4.4
2006	4,479	4,292	187	4.2
2007	4,466	4,288	178	4

Table 3-10: Town of Sterling Labor Force and Unemployment Rates First Quarter 2008 by month

Month	Year	Labor Force	Employed	Unemployed	Unemployment Rate
4	2008	4,397	4,273	124	2.8
3	2008	4,442	4,278	164	3.7
2	2008	4,449	4,263	186	4.2
1	2008	4,486	4,280	206	4.6

The Commercial and industrial zoning districts in the town are comparatively small and are located in water protection districts which control the permitted uses and require industry practices that are sensitive to protection of public drinking water supplies. While sewerage and water are concerns for business and industrial development, Table 3-11 indicates slow but steady growth in employment within Sterling. Thus, employment in Sterling increased by 370 positions, or 17 percent, between 2001 and 2006. However, after a period of gradual growth between 2001 and 2004, the number of businesses declined, with 2 fewer concerns in 2006 than in 2003. In 2000, the majority of industries in Sterling were small operations with less than 10 employees, as shown in Table 3-11, which lists the number and classification of major employers in Sterling. As of 2006, the average business in Sterling still had less than 11 employees.

Table 3-11: Town of Sterling Businesses and Employment 2001 thru 2006

Years	Number of Businesses	Number of Employees	Average Employment Per Business
2001	197	2,163	11.0
2002	202	2,194	10.9
2003	234	2,210	9.4
2004	240	2,302	9.6
2005	240	2,503	10.4
2006	232	2,533	10.9

Executive Office Of Labor and Workforce Development (EOLWD) June 2008. www.mass.gov/eolwd

Table 3-12: Number of Employers by Industry Classification and Employment Size Class, 2000

Industry Code Description	Total places	Employment-size class					
		'1-4'	'5-9'	'10-19'	'20-49'	'50-99'	'100-249'
Forestry, fishing, hunting, and agriculture	3	1	1	1			
Utilities	1	1					
Construction	32	23	6	3			
Manufacturing	20	2	4	2	8	2	2
Wholesale trade	12	8	1	2		1	
Retail trade	16	10	3	1	2		
Transportation & warehousing	5	1	2	2			
Information	3	3					
Finance & insurance	7	4	2	1			
Real estate & rental & leasing	8	7		1			
Professional, scientific & technical services	12	11		1			
Administration, support, waste management, remediation services	7	5	1	1			
Health care and social assistance	11	3	4	2	2		
Arts, entertainment & recreation	4	1		3			
Accommodation & food services	14	9	1	3		1	
Other services (except public administration)	11	6	2	3			
Unclassified establishments	4	4					
Total	170	99	27	26	12	4	2

Source: U.S. Census Bureau

Table 3-12: Major Employers in Sterling, 2000

Business Name	Employees	Description
Admore Inc	30	Advertising & point of purchase displays
Advanced Digital Motion	14	Design and Manufacture of automated machinery
Albright Technologies	1	Custom prototype & injection molds, plastic molding
Chocksett Inn	21	Inn and restaurant
Cycles Inc	74	Injection molding: plastic medical parts
Don-Jo Manufacturing Inc	47	Lock accessories
Essex Thermo Corp	4	Multi-fuel boilers
Ewell Herman R Inc		(trucking)
Fiber optic Components Inc	35	Fiber optic Light Guides
Glidden Computer Publishing	1	Typesetting and Desktop Publishing
Heat Technology, Inc.	25	Research and Development: computer system cooling products
Hendrickson Advertising, Inc.	4	Textile Screen-printing, decals & posters
Horace Mann Educational Assoc.	50	Nonresidential rehabilitation center for mentally challenged adults
Hudson D M Inc		(trucking)
Ideal Industries Inc	138	Power connectors, injection molds & molded medical equipment
Image Diagnostics, Inc.	17	Manufacture monitor suspension systems & radiological tables
J D Industries Inc	48	Automation machinery; plastic injection molding & assembly
Webster Veterinary Supply	80	Distributors of veterinary supplies
Kyle Equipment Co. Inc	5	Manufactures hydro-fracturing machinery & water well drilling equipment
Laddawn, Inc	87	Wholesales poly bags
Lawrence Sigler Machine Co	10	Plastic abrasive tumbling media
Lee Plastics Inc	40	Custom plastic injection molding
Loan Associates		(trucking)
Morse Manufacturing Inc	40	Truck mounting equipment
New England Mold Sterling	35	Steel molds for the plastic industry
Northeast Poly Bag Co	125	Manufactures polyethylene bags
Stromberg Tool & Machine Co	20	Machine Shop: precision machining tool & die
Wachusett Precast, Inc	4	Precast concrete
Wireway Huskey Corp	32	Woven wire enclosures
Total Employment	987	

Source: Harris Infosource

In 2000, industries with the highest number and concentration of employees in the surrounding region included Educational, health and social services (14,648); Manufacturing (both durable and non-durable goods (12,542); and Professional services and Waste Management (5,117), as shown in Table 3-11. In 1990, industries with the highest number and concentration of employees in the region included Finance, Insurance, and Real Estate (13,549), Educational, health and social services (9,894) and Retail Trades (7,287). Some of the differences may be due to reclassification error between the 1990 classification structure and that in place in 2000.

Table 3-11: Employment by Employment Sector 1990 and 2000 for the Sterling region.

<i>Community</i>	<i>Year</i>	<i>Agr., forestry, fishing, hunting, and mining</i>	<i>Arts, entertainment, recreation, hotels and food</i>	<i>Construction</i>	<i>Educational, health and social services</i>	<i>Finance, insurance, real estate, and rental and leasing</i>	<i>Information</i>	<i>Manufacturing</i>	<i>Other services (except public administration)</i>	<i>Professional services and waste management</i>	<i>Public administration</i>	<i>Retail trade</i>	<i>Transportation and warehousing, and utilities</i>	<i>Wholesale trade</i>	<i>Total</i>
Boylston	1990	35	15	85	349	408	73	136	97	167	63	230	30	153	1,841
	2000	22	380	316	2,376	780	255	1,239	212	656	317	790	327	270	7,940
		-13	365	231	2,027	372	182	1,103	115	489	254	560	297	117	6,099
Clinton	1990	86	62	515	985	2,345	120	290	371	437	292	712	184	496	6,895
	2000	22	390	349	1,328	404	251	1,723	325	600	316	722	237	204	6,871
		-64	328	-166	343	-1,941	131	1,433	-46	163	24	10	53	-292	-24
Holden	1990	122	33	324	1,868	1,260	135	780	415	541	244	1,167	155	501	7,545
	2000	22	380	316	2,376	780	255	1,239	212	656	317	790	327	270	7,940
		-100	347	-8	508	-480	120	459	-203	115	73	-377	172	-231	395
Lancaster	1990	77	71	172	925	754	50	101	208	251	111	399	65	209	3,393
	2000	5	177	250	795	153	81	674	97	358	84	265	91	117	3,147
		-72	106	78	-130	-601	31	573	-111	107	-27	-134	26	-92	-246
Leominster	1990	130	157	948	2,995	6,065	258	1,061	1,027	975	836	2,948	605	1,528	19,533
	2000	91	1,205	1,045	4,082	999	641	5,148	848	1,540	1,010	2,287	619	706	20,221
		-39	1,048	97	1,087	-5,066	383	4,087	-179	565	174	-661	14	-822	688
Paxton	1990	46	17	81	443	373	18	257	153	156	55	440	50	60	2,149
	2000	17	176	118	740	175	19	306	53	157	72	245	80	65	2,223
		-29	159	37	297	-198	1	49	-100	1	17	-195	30	5	74
Princeton	1990	55	26	148	418	349	16	93	60	84	106	294	58	98	1,805
	2000	14	140	78	470	207	61	322	34	186	75	110	78	39	1,814
		-41	114	-70	52	-142	45	229	-26	102	-31	-184	20	-59	9
Rutland	1990	87	28	181	671	458	79	180	89	179	121	372	144	79	2,668
	2000	42	170	165	839	207	65	641	153	294	164	334	223	103	3,400
		-45	142	-16	168	-251	-14	461	64	115	43	-38	79	24	732
Sterling	1990	34	35	225	589	880	88	281	122	221	57	342	116	306	3,296
	2000	29	185	271	820	211	137	838	295	412	160	370	124	146	3,998
		-5	150	46	231	-669	49	557	173	191	103	28	8	-160	702
West Boylston	1990	51	17	167	651	657	66	256	194	298	81	383	58	140	3,019
	2000	14	187	175	822	307	68	412	156	258	132	380	98	90	3,099
		-37	170	8	171	-350	2	156	-38	-40	51	-3	40	-50	80
Region Total	1990	723	461	2,846	9,894	13,549	903	3,435	2,736	3,309	1,966	7,287	1,465	3,570	52,144
	2000	278	3,390	3,083	14,648	4,223	1,833	12,542	2,385	5,117	2,647	6,293	2,204	2,010	60,653
		-445	2,929	237	4,754	-9,326	930	9,107	-351	1,808	681	-994	739	-1,560	8,509

Source: US Census: Industry – Employed Persons 16 and Over 1990 and 2000. Other Services: business & repair, personal. Professional Services: scientific, management, administrative

E. GROWTH AND DEVELOPMENT PATTERNS

1. Patterns and Trends

The town began as an outpost of the Nashaway Plantation (Lancaster). Proximity to the Waushacum lakes and the presence of Indian paths facilitated the growth of Sterling as a farming community. Although thriving small enterprises produced hats, clocks, pottery, cider, chairs and other wooden items; agriculture, chiefly dairy and fruit crops, formed the town's economic base. Development of the Railroads in the mid-1800s dramatically enhanced the agricultural success of the town, providing convenient, rapid access to regional markets in Central and Eastern Massachusetts. Construction of the Wachusett Reservoir led to a shift in the development of the town as the state acquired thousands of acres of farmland for the development of the public water supply system. Later, regional economic decline in the first half of the 19th century preserved the rural character of the town.

For many years, people have expressed concern over attaining public access to the MDC (now DCR-DWSP) properties, for hunting, fishing and other forms of passive recreation. The DCR owns Major tracts of land, and it seems to many residents that public access is not permitted. Some portions of the DCR properties are open to the public for passive recreation such as fishing, hiking, or bird watching, however, the DCR restricts some activities to protect against pollution of the Stillwater River and Wachusett Reservoir watersheds. The DCR provides for public access as described in its Public Access Plan.²⁹ Public access to and recreational use of drinking water supply lands and surface water supplies can serve as potential routes for the introduction of disease causing agents, so purveyors of drinking water must exercise caution when considering policies for recreation on water supply lands.

Since 1950, Sterling has shifted away from farming, as significant amounts of forest and farmland have been converted to residential market rate subdivisions. Post war economic success and the baby boom resulted in tremendous population growth. Yet in atmosphere, Sterling remains rural, with most residences clustered in village centers or interspersed across broad stretches of open land. The watershed protection efforts of the DCR have confined the development of the town to the northeast quadrant of the town. Almost two-thirds of Sterling's land is still in forest or farms.

Agriculture is still a significant land use in Sterling. The town has a higher proportion of its land dedicated to farming than is generally the case in Worcester County. Sterling's farms are prosperous; the town has more high-rated members of the Farm Bureau than any other town in the county. Orchards are the primary source of agricultural income in Sterling, but the agricultural base is quite diversified, and includes dairies, nurseries, a goat farm, and several tree farms.

But the development trends of the past fifty years have threatened the farms and forests that are not owned or protected by the DCR. The general trend has been to convert large tracts of land into large subdivisions. From 1980 to 2000, the trend has been to build larger and larger homes on each buildable lot, prompting one Sterling resident to coin the term "McMansion," to describe the source of frustration with the development practices of builders. Over 87 percent of the town is zoned for Rural Single-Family Residential uses. This district does not specifically provide for development of recreation resources. Prior to 1997, the town had a one-acre minimum lot size. In an effort to control growth, the town voted in a zoning change requiring a minimum of two acres per lot. This prompted many landowners to sell their land to developers or to file subdivision plans themselves while a five-year grandfathering of the prior dimensional requirements remained in effect.

Except for package treatment plants at Waushacum Village and the nursing home on Dana Hill in Performance Zone 1, the town does not have sewer infrastructure, and thus requires zoning that ensures the septic wastes can be properly disposed of through septic systems. Also, large tracts of land protect the Wachusett Reservoir watershed. The two-acre zoning and the DCR controlled properties are effective limits on some of the growth potential, but, two-acre zoning with large frontage requirements can promote a sprawl pattern of development.

Town zoning established a Light Industrial district that encompasses about five percent of the total land area. Conversations with the Planning Board during the development of the EOEA Buildout Analysis revealed that anticipated new industries are most likely to be a mix of the following uses:

²⁹ <http://www.mass.gov/dcr/waterSupply/watershed/wachaccess.htm>

- | | |
|---|---|
| ▪ Motor Vehicle Repair or Body Shop | ▪ Greenhouse |
| ▪ Rail or Motor Freight Terminal, bus storage yard | ▪ Wholesale, warehouse, or distribution facility |
| ▪ Bus or Railroad Station | ▪ Restaurant |
| ▪ Storage of coke, coal, sand, or other materials whether indoors or not | ▪ Earth removal |
| ▪ Open lot storage of building materials, contractor's equipment, and similar materials | ▪ Manufacturing, assembly, processing, packaging, or other industrial operation |

For many of these uses the town will need to take care that the industries do not adversely affect the Wekepeke aquifer, since the Industrial Zone is fully enveloped in the Water Resource Protection Overlay District.

2. Land Use Changes from 1985 to 1999

Sterling has a total land area of 20,230 acres, with roughly 800 acres of water. At present, the DCR owns or controls 5,561 acres or 26 percent of the land area, for the purpose of water protection for waters flowing to the Wachusett Reservoir. As of 1999, over 56 percent of Sterling was still forested. Agricultural uses such as cropland, pasture and orchards accounted for over fourteen percent of the land area, while residential uses accounted for fifteen percent at 3,035 acres. In contrast, in 1985, forestland accounted for nearly 60 percent of the land area, agricultural uses accounted for 16 percent, and residential uses accounted for just eleven percent. Water accounted for four percent of the area in both 1985 and 1999. Table 3-7 lists the 1999 land uses and the changes since 1999. Table 3-8 documents the pattern of land use shifts over the 15-year period.

From 1985 to 1999, a total of 2,010 acres of land has shifted in use. Since 1985, the most significant change was a loss of 897 acres of forestland to a variety of uses, the largest of which was 368 acres converted to residential lots of one acre or more. Another 147 acres of forest was converted to residential uses on lots of less than one-half acre. The development of a golf course converted another 112 acres of forestland. At the same time, over 300 acres reverted to forestland from other uses, including: Cropland, Open Land, Pasture, Mining, Urban Open, Transport, Industrial, and Waste Disposal.

Another major change was the development of 809 acres of land for residential uses, 584 acres for residential lots greater than one-half acre and 225 acres for residential lots less than one-half acre. None of this development was for multifamily residential use.

A total of 264 acres of cropland shifted to a variety of new uses including: 154 acres for residential uses, 20 acres for participant recreation, and 9 acres for a new orchard. A total of 14 acres reverted to Forest and 58 acres are considered abandoned cropland or Open Land. Changes in open land were diverse. A total of 244 acres shifted out of Open land, while another 341 acres reverted to Open Land. Among the changes were reforestation of abandoned lands, development of residential properties, some clear-cutting, abandonment of croplands, orchards, and pasture, and completion of sand and gravel excavation.

A total of 193 acres of pastureland shifted to other uses while only fourteen acres was regained for the forest or Open Land. Most of the pastureland that changed became classified as Open Land, at 131 acres. Thirty-one acres were developed for residential use, 13 acres reforested, twelve acres were converted to either cropland or orchards, and 5 acres were developed for participation recreation.

Table 3-12: Summary of Sterling Land Use Changes from 1985 to 1999

LU Code	Land Use	Acres 1985	Acres 1999	% of Total Land Area 1999	Change in acres From '85 to '99	% Change
1	Cropland	2,013.9	1,827.5	9%	-186.4	-9%
2	Pasture	525.2	349.9	2%	-175.3	-33%
3	Forest	11,929.9	11,339.5	56%	-590.3	-5%
4	Wetland	200.6	202.4	1%	1.9	1%
5	Mining	206.7	133.0	1%	-73.7	-36%
6	Open Land	468.9	562.2	3%	93.4	20%
7	Participant Recreation	58.7	84.8	0%	26.1	44%
9	Water Based Recreation	3.9	3.9	0%	0.0	0%
10	Residential Multi-family	3.9	36.2	0%	32.3	828%
11	Residential < 1/4 Ac	46.3	46.3	0%	0.0	0%
12	Residential 1/4 to 1/2 Ac	608.0	832.1	4%	224.0	37%
13	Residential > 1/2 Ac	1,546.6	2,120.4	10%	573.8	37%
15	Commercial	51.8	73.2	0%	21.4	41%
16	Industrial	77.4	151.6	1%	74.2	96%
17	Urban Open	81.7	51.1	0%	-30.6	-37%
18	Transport	469.2	416.9	2%	-52.3	-11%
19	Waste Disposal	44.3	94.0	0%	49.7	112%
20	Water	808.3	808.3	4%	0.0	0%
24	Powerlines	262.4	262.4	1%	0.0	0%
26	Golf	0.0	111.6	1%	111.6	100%
31	Urban Public	52.3	53.2	0%	0.9	2%
34	Cemeteries	28.5	29.7	0%	1.2	4%
35	Orchard	731.1	632.1	4%	-99.0	-14%
36	Nursery	11.2	8.4	0%	-2.8	-25%
	Total Acres	20,230.7	20,230.7	100%		

Sources: MassGIS Land Use Coverages for 1985 and 1999 based on MacConnell land use surveys for 1985, and 1999 and updated through the EOEA buildout project.

Table 3-13: Land Use Shifts in Sterling from 1985 to 1999

From\To	Residential > 1/2 Ac	Open Land	Forest	Residential 1/4 to 1/2 Ac	Golf	Industrial	Cropland	Waste Disposal	Urban Open	Residential Multi-family	Mining	Participant Recreation	Orchard	Commercial	Pasture	Water	Nursery	Wetland	Cemeteries	Total Change
Forest	368	84		147	112	21	23	55	12	27	25		5	8	8				1	897
Cropland	94	58	14	56					9	5		20	9							264
Open Land	44		171	12		1	5		2		2			1	6					244
Pasture	28	131	13	3			3					5	9							193
Mining		22	9			47			21			2								101
Orchard	35	10					46		4											95
Urban Open	4	21	18			25								10						78
Transport			50													2				52
Industrial	11	6	15																	32
Waste Disposal		3	27			2														32
Residential > 1/2 Ac				7										2			2			11
Nursery		5																		5
Water	1																	2		3
Residential 1/4 to 1/2 Ac														1						1
Participant Recreation																1				1
Total Change	584	341	317	225	112	97	77	55	47	32	28	27	23	21	14	3	2	2	1	2,010

Sources: Sources: MassGIS Land Use Coverages for 1985 and 1999 based on MacConnell land use surveys for 1985 and 1999 and updated through the EOEa buildout project.

Growth in industrial, commercial, and residential land uses are inevitable, given the increased accessibility to metropolitan areas provided by I-190. Industrial and commercial development has taken place mainly in the Pratt's Junction area, where the land is so zoned, near the interchange of I-190 and Route 12. This trend is expected to continue, and to lead to a related growth in residential use in other areas of town. Since this industrial zone lies largely in the Wekepeke Aquifer, great care must be taken in the siting and material handling practices of industries. If possible, industries that use or produce hazardous substances should be especially well designed, monitored frequently, and carefully regulated. If such a program is not possible, these types of industries should not be permitted to locate on valuable groundwater resources.

Between 1990 and 2000, the Planning Board approved a total of 689 new residential construction permits (an average of 86 units per year), and another 243 as shown in Table 3-14. In the same decade, the Planning Board approved a total of 34 new subdivisions. Since 2000, the Planning Board approved another 11 subdivisions as summarized in Table 3-15. The permits were a mix of both Approval Not Required (ANR) units and subdivision developments. In February 1997, Sterling changed its residential zoning from one-acre minimum lot size to two-acre lot size for a single family home to accommodate adequate septic systems. The zoning change spurred a development boom as many property owners, seeking to take advantage of the five-year period of grandfathered one-acre lot sizes, filed subdivision plans. Of the 450 new residential construction permits issued for these subdivisions (an average of 46 units per year), approximately 307 housing units have been built.

Table 3-14: New Building Permits Issued

Year	1990	1991	1992	1993	1994	1995	1996	1997*	1998	1999	2000	Total
Permits Issued		24	96	80	70	130	62	96	131	N/A	N/A	689
Buildout Analysis	17	24	42	46	44	50	52	73	65	54	41	508

Source: Sterling Planning Board.

*Change in zoning law, N/A=these figures were unavailable at the time of printing.

Year	2001	2002	2003	2004	2005	2006	2007	2008	Total
Permits Issued	45	42	38	29	45	23	13	8	243

Table 3-15: Subdivisions Approved or Built Since 1990

Subdivision Name	Street Name	Total Units	Date Approved	Units Built by 2002	Units Built by 2009	Diff.	Road Accepted
Chad Lane	Chad Lane	5	7/13/2005	0	0	5	No
Goulding Estates	Nathan Tyler Lane	5	1/9/2008	0	0	5	No
Greenview(Fairview)	Sandy Ridge Road	39	6/14/2000	35	36	3	5/14/2007
Juniper Brook	Brookside Lane	9	2/10/1993	9			5/18/1996
Larson Estates	Avery Lane	11	2/5/1998	11			5/12/2003
Laurelwood	Pamela Lane	10	6/26/1995	10			5/11/1998
Lesley Lane	Lesley Lane	11	11/15/2000	6	11		5/14/2007
Mountain View Estates	Finis Lane	2	9/10/2008	0	0	2	No
(In Sterling)							
North Row Estates	Kathleen Lane	4	6/9/2004	3		1	No
Pheasant Hill	Pheasant Hill Lane	6	6/9/2004	4		2	No
Pine Woods	Pine Woods Lane	8	2/5/1998	5	7	1	5/14/2007
Pinecrest Estates II	Village Lane	6	3/31/2004	5		1	5/14/2007
Primrose Lane	Primrose Lane	3	5/12/2006	0	0	3	No
Redemption Road Estates	Jennifer Lane	2	10/17/1989	1	2		No
Redstone Estates	Ashton Lane	12	5/13/1992	12			5/23/1994
Redstone Woods	Matthew Lane	12	1/28/1998	11		1	5/16/2005
Ridgewood	Ridgewood Lane	12	8/30/1989	11		1	5/15/2006
Rolling Ridge Acres	Blueberry Lane	12	1/17/1996	12			12/11/2000
Runaway Brook	Runaway Brook Rd, Fern Lane (In Sterling)	20	12/17/2003	0	0	20	No
Snug Acres Estates	Calvins Lane	10	2/21/1996	10			11/13/2001
Stonecrest Lane	Stonecrest Lane	5	5/10/2008	0	0	5	No
Strawberry Patch	Abbey Lane	1	7/6/1990	1			No
Stuart Farms Estates	Stuart Road	12	5/27/1998	7	12	0	5/16/2005
Tara Heights	Tara Lane	7	7/15/1992	5		2	4/18/1996
Thomas Lane	Thomas Lane	6	1/12/2005	2	4	0	No
Trebor Lane	Trebor Lane	3	10/12/2005	0		3	11/17/2008
Tucker Hill Estates	Karen Drive Extension	5	5/6/1992	5			5/23/1994
Tucker Hill Estates	Heather Lane	9	5/6/1992	9			5/23/1994
Village Green	Olde Parish Lane	12	10/30/1996	12			5/17/1999
Windy Hill	Sky Farm Lane	12	2/28/1990	12			5/18/1996
Total		271		198	72	55	

Source: Sterling Planning Board/Buildout Analysis

(Numbers may need to be revised, could be a few instances of double counting between 2002 and 2009 columns)

3. Infrastructure

a). Transportation System

The principal highways serving the town are Interstate I-190 and State Routes 12, 62 and 140. The construction of I-190 in the early 1980's reduced driving time to either Worcester or Leominster to less than 20 minutes and provided Sterling with much improved access to job markets and shopping. It also provided much needed access to Route 2, a major east/west highway and the primary link to the greater Boston area, and to Interstate 290, which passes through Worcester and connects to the Turnpike and Interstate 395 serving Connecticut. Since its opening, traffic on I-190 increased steadily, and the highway provided much needed relief in the traffic volumes on Route 12. I-190 is classified as a Principal Arterial, and as of 1998, the highway carried an average daily traffic volume of 34,668 vehicles.

Route 12 is Main Street through the center of Sterling, Leominster Road north of the center, and Worcester Road south of the Center. Interstate 190 intersects Route 12 in Sterling at Exit 6 about 1.5 miles north of the town center, providing ready access to the town from the north. Sterling's industrial zone is located north of the center on Route 12, near the I-190 interchange, making it very attractive for development. Route 12 is classified as a Principal Arterial/Minor Arterial, and carried an average daily traffic volume of 7,867 vehicles as of 1998.

Both Exits 5 and 6 on I-190 provide access to the town from the south. Route 140 intersects I-190 at Exit 5 and provides easy access to Wachusett Mountain, a regional recreation center 10 miles northwest of Sterling. The land located in the vicinity of Exit 5 is zoned Rural Residential/Agriculture. Most of that land is currently open space with ANR residential development. A Performance Zone Overlay District provides for commercial uses near the interchange that must meet strict water quality standards for Site Plan Approval. Recently, several new business ventures were developed in this zone, including a new retail nursery/greenhouse and a self-storage company. A new nursing home is currently under construction on Dana Hill Road. Growth pressure due to proximity to the interchange could result in significant changes in land use in that area over the next few years.

Route 140, also known as Redemption Rock Trail, was once an old Indian trail that served as the main road for the Nipmuc and Wampanoag Indians between Rhode Island and New Hampshire. It takes the traveler to Wachusett Mountain, passing the Redemption Rock, in Princeton, where Mary Rowlandson was redeemed from her Indian captors after months of captivity in 1675. In Sterling, the State route follows the course of the Stillwater River. The road is noted for its role in the historical economy of the Town. A village of thirty residences sprang from the cottage pottery industry made possible by the clay found in the nearby Stillwater River. Today the road is classified as a Principal Minor Arterial.

Route 62, known as both Clinton Road and Princeton Road, is another state road that had origin as an Indian path. The road links Princeton and Princeton, passing through the center of Town as Main Street, the Junction of Routes 62 and 12. In its past, the Princeton Road portion of Route 62 was the cradle of small cottage chair-making and hat-making shops. Clinton Road today still retains the expansive farmlands that define the rural character of Sterling. This road is classified as a Minor Arterial/Major Collector

Route 110 at the southern edge of Sterling links the towns of Harvard, Lancaster, Clinton and West Boylston, skirting the Wachusett Reservoir. The road intersects Route 12 in West Boylston, slightly east of Oakdale.

At several town meetings, voters designated many of the roads in Sterling as Scenic Roads. The Historic Commission wrote the scenic roads bylaw. The Planning Board has accepted all of these scenic roads and they are the enforcing agency.

1996 – Flanagan Hill Road, Pratt's Junction Road, North Row Road, Upper North Row Road, and Justice Hill Road,

1997 – Albright Road, Chace Hill Road, Heywood Road, Meetinghouse Hill Road, Rowley Hill Road, Swett Hill Road, Williams Street,

1998 – Beaman Road, Bean Road, Bird Street, Boutelle Road, Bridge Street, Burpee Road, Campground Road, Chamberlain Road, Charles Paten Drive, Clemence Avenue, Crowley Road, Dana Hill Road, Elliott Road, Fairbanks Road, Ford Road, Gates Road, Gates Terrace, Goulding Road, Greenland Road, Hardscrabble Road, Hastings Road, Hawkins Lane, Holden Road, Houghton Road, Jewett Road, John Dee Road, Johnson Road, Justice Hill Cutoff, Kendall Hill Road, Kilburn Road, Laurelwood Road, Legate Hill Road,

Maple Street, Mellen Hollow Road, Mortimer Road, Muddy Pond Road, Newell Hill Road, North Oakdale Cutoff, Old Princeton Road, Osgood Road, Palmer Road, Pine Street, Redstone Hill Road, Redstone Place, Reed Road, Roper Road, Rugg Road, School Street, South Nelson Road, Squareshire Road, Stuart Road, Taft Road, Tuttle Road, Twine Road, Waushacum Avenue, Westland Farm Road, Wilder Lane, Wilder Road, Wiles Road.

At the height of the railroad era, Sterling had three railroads, The Fitchburg and Worcester Railroad, the Worcester and Nashua Railroad, and The Agricultural Branch. The railroads played a major role in the agrarian economy of Sterling bolstering its dairy and fruit crop markets and spurring a cider mill industry. They also sparked real estate speculation and enhanced the popularity of the Methodist Association Campgrounds near Sterling Junction. For a time the railroad made Sterling a summer resort destination by providing access to the Waushacum Lakes.

The Fitchburg and Worcester Railroad, constructed between 1848 and 1850, connecting Fitchburg to stations in Leominster, Pratts Junction and Sterling Junction. Passenger service between Fitchburg and Sterling Junction was available from 1850 until 1925. Today, Conrail operates the surviving segment of the rail line, serving local roundtrip freight once a day, Monday through Friday between Framingham and Leominster, through Pratts Junction. The remaining right of way south of Pratts Junction is abandoned, and the segment between the cider mill and West Lake Waushacum (owned by the DCR) now forms the proposed Sterling Rail Trail. The Conservation Commission owns a parcel of land just west of another abandoned segment that runs north from the Town center to Pratts Junction.

The Worcester and Nashua Service connected Worcester, Oakdale, Sterling Junction Clinton, and Ayer to Nashua, NH. The service operated from 1848 to 1934, though service to Ayer was available until 1960. In the 1920's, the Boston and Maine company rebuilt the line between Ayer and Worcester to handle the heaviest trains. Passenger service to Ayer ended in 1953. Guilford acquired the line in the 1980's and renovated it to serve through freight trains between Maine and Worcester, where they interchange with Conrail.

The Agricultural Branch built between 1849 and 1855 and operated by Boston and Worcester Rail Road, connected Framingham, Marlboro, Northborough, Clinton, Pratts Junction and Fitchburg. In 1866, the line was extended from Northborough to Pratts Junction, where it intersected the Fitchburg and Worcester service. Passenger service was available between Marlboro and Pratts Junction until 1931. Conrail has operated freight service since 1976.

Biking is popular with many Sterling residents and Rubel features the Town on its *Central Massachusetts Bicycle and Road Map*, for several roads recommended for bicycling. Howard Stone, in "Short Bike Rides in Greater Boston and Central Massachusetts," listed a 14-mile bike route through West Boylston and Sterling. The ride begins at the picnic area at the junction of Routes 12 and 140 near the Wachusett Reservoir, in Oakdale. The bike route starts north on Route 140, and bears right on Waushacum Street in the village of Oakdale. At the intersection of Dana Hill Road and Muddy Pond Road, the tour bears right again on Muddy Pond Road and proceeds up Jewett Road. Along this stretch there is a view of Wachusett Mountain. At the end of Jewett Road, it follows Route 62 east to the junction of Route 12 (Main Street, Sterling). The trail follows Main Street through the busy town center to Clinton Road, where it bears right and proceeds uphill on Redstone Hill Road to its crest. The reward for this steep climb is a "Long lazy downhill through farms and Orchards with views of distant hills" across Nashua Valley.

At this point, the rider can choose the short loop that continues through Sterling or take a long loop through Lancaster. The Sterling bike route turns right on Route 62 and continues to Chace Hill Road, where the rider will turn right. The bike route continues on Chace Hill Road to a fork where the rider will bear left on Squareshire Road. From there, the tour continues to Route 110 and bears right to the intersection of Route 12. A little to the east of this point on Route 110 the rider has a sweeping view of Wachusett Reservoir. The bike tour continues on Route 12 to end at the picnic area where the ride began.

Bicycling enthusiasts in town are strong advocates for trail planning both for the Mass Central Rail Trail and for a proposal to create a Sterling Rail Trail that would create a link between the Mass Central Rail Trail and the center of town following the abandoned right of way of the old Fitchburg and Worcester Railroad.

b). Water Supply

Present Water Supply:

All of Sterling's land area lies within the Nashua River Watershed drainage. As of 2008, 100 percent of the municipal water supply for the Town of Sterling derives from the "Wachusett Watershed" which flows into the Wachusett Reservoir and ultimately into the Nashua River (unless consumed en route). Since the municipal wellheads lie within the Wachusett Watershed, they are protected by the relatively strict regulations of the Watershed Protection Act (WsPA) established and administered by the DCR-DWSP to protect public water supplies, including the Wachusett Reservoir.³⁰³¹ As of 2008, the Wachusett Reservoir supplied drinking water to 47 communities, 2.2 million people, and 5,500 industrial users in the metropolitan Boston area.³²

The Town of Sterling does not currently utilize reservoirs or any other surface water resources and relies on ground water sources from the Wachusett Watershed for Municipal water. The "West Sterling" wellfield, located off Route 140 near the intersection of Burpee Road, has a potential yield of an estimated 2 million gallons per day (GPD). The pump station has been equipped with an ultraviolet water treatment system since 2002. The West Sterling wellfield presently includes three wells (Wells #03G, #04G, and #05G) and provides most of the water for the municipal system.

Source Name	DEP Source ID	Source Type	Location of Source
Well #3	2282000-03G	Groundwater	Redemption Rock Trail
Well #4	2282000-04G	Groundwater	Redemption Rock Trail
Well #5	2282000-05G	Groundwater	Redemption Rock Trail

As of January 2008, the Town reactivated additional capacity in a second wellfield just north of West Waushacum Lake through three newly drilled well sites in the general vicinity of the inactive Well #2. The "pump station" is located at 109 Worcester Road near the intersection of Route 12 and Greenland Road.

Source Name	DEP Source ID	Source Type	Location of Source
Well #2A	2282000-???	Groundwater	109 Worcester Road
Well #2B	2282000-???	Groundwater	109 Worcester Road
Well #2C	2282000-???	Groundwater	109 Worcester Road

According to the 2007 Annual Drinking Water Report,³³ the updated facility creates redundancy to the municipal water supply system in case of an emergency. It includes a "state of the art ultraviolet treatment and chemical feed system to maintain pH levels for corrosion control and maintaining low levels for lead and copper." Sterling monitors the municipal water supply system using an integrated computer-controlled system. Both remote and local control of the wells is possible. Past salt contamination of this well field (Well #1 in particular) has been attributed to treated sand storage at the nearby Department of Public Works facility on Route 12.³⁴ Fortunately, recent reports suggest that the three new wells have shown no indications of salt contamination (sodium or other) to date.³⁵

³⁰ More information about the Watershed Protection Act (WsPA) can be found at <http://www.mass.gov/dcr/waterSupply/watershed/wsapa.htm> as of 6/19/2008.

³¹ formerly known as the Metropolitan District Commission (MDC).

³² <http://www.mass.gov/dcr/waterSupply/watershed/shed.htm>

³³ 2007 Annual Drinking Water Quality Report for the Town of Sterling Water Department (DEP PWSID # 2282000) attained via 7/11/2008 fax from Sterling DPW.

³⁴ 2002 interview of Lou Manring, Sterling DPW, by Brian Cline.

³⁵ 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

The approximate wellfield locations are marked with a flag on the **Water Resources Map**. The Water Resources Map includes a graphical representation of the WsPA and WPA regulations. The RPA regulations are not shown for map readability purposes, but the RPA affords shoreline more broad-reaching protection to water bodies including rivers, streams, lakes, and swamps.³⁶

According to the DPW section of the 2007 Town of Sterling Annual Report, total water sales for the year exceeded \$752,500 with \$24,250 in collections for hydrant rentals. The Sterling DPW website summarizes the municipal water usage as follows:³⁷

Town water is supplied from three wells in West Sterling and a single well on Route 12 near West Waushacum Lake. When all wells are on line, they have the capacity to pump approximately 1500 gallons per minute into the distribution system. Sterling pumps an average of 610,000 gallons of water per day, which equates to approximately 222 million gallons per year. In the summer, sometimes as much as 1.5 million gallons of water a day are pumped. The increase is primarily due to lawn watering.

There are roughly 68 miles of water mains and over 450 water hydrants in the distribution system. At present, there are 2217 water service connections including 2125 residential connections, which serve approximately 80% of the population. The remaining town residents use private wells.

Water pressure and storage is supplied by water tanks each with an overflow level of 736 feet. A tank on Osgood Rd is approx. 800,000 gallons and is a wire wrapped pre-stressed concrete tank. A second tank on Kendall Hill is a 250,000-gallon steel tank. The new third tank on Tuttle Rd. is an underground poured-in-place concrete tank and has a capacity of 1.3 million gallons.

Over the past decade, peak consumption rates have tested the limits for water storage, so the Town of Sterling has actively worked to increase system well and storage capacity and installed a 1.3 million gallon storage tank near Tuttle Road. This more than doubled the combined storage capacity of the existing tanks on Osgood Road (800,000 gallons) and on Kendall Hill (250,000 gallons). Due to the elevations of the storage tanks, extension of water service to elevations above 655 feet would require an expensive, secondary pumping system to maintain a DEP-recommended water pressure of 35 psi to serve these locations safely and effectively.³⁸ Therefore, large areas of the Town, chiefly in the northern and western sections of Town currently rely on private wells. As of 2008, the Sterling DPW was considering the possible benefits of expanding the municipal water supply infrastructure to these higher elevations.³⁹

Future Water Supply:

In 2006, the Town of Sterling updated its Waterworks Facilities Master Plan.⁴⁰ The document serves as an important guide for the Sterling DPW since it contains information regarding the current municipal system as well as projections regarding future needs. The Sterling DPW is also planning to update its Source Water Protection Plan with the support of Massachusetts Rural Watershed Association^{41 42}. Although Sterling's current municipal water supply derives 100 percent of sourced from aquifers within the Wachusett Watershed, the greater Nashua River Watershed may be a suitable source for future municipal water supply within the Town borders.

Wachusett Watershed:

In 2002, the Town of Sterling was in the process of assessing an alternative well field location within the Stillwater Aquifer of the Wachusett Watershed, specifically considering potential well locations along Muddy Pond Road di-

³⁶ This mapping decision was made in part based on personal communication with representatives of Massachusetts Watershed Coalition (www.mwc.org), MassWildlife (www.masswildlife.org), and the Nashua River Watershed Association (www.nashuariverwatershed.org).

³⁷ Information taken verbatim from Sterling DPW Website <http://www.sterlingdpw.com/Water.htm>
As of 6/17/2008, last modified July 12, 2007 according to the website.

³⁸ Waterworks Facilities Master Plan, Town of Sterling, Compiled by Fay, Spofford & Thorndike, February, 2006. Dennis P. Boucher, Registered Civil Engineer.

³⁹ Per 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁴⁰ Waterworks Facilities Master Plan, Town of Sterling, Compiled by Fay, Spofford & Thorndike, February, 2006. Dennis P. Boucher, Registered Civil Engineer.

⁴¹ Per 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁴² See <http://www.massrwa.org>

rectly across from Muddy Pond and just east of the Stillwater River. No testing efforts in the vicinity of Muddy Pond Road were noted in the 2004 to 2008 timeframe.⁴³

Nashua River Watershed:

The Wekepeke Aquifer underlies the Wekepeke sub-basin of the Nashua River Watershed and consists of a broad band of gravelly deposits along Wekepeke Brook extending from the Heywood Road vicinity eastward toward the Pratt's Junction Road area and ultimately northward along I-190 into Leominster and Lancaster near Jungle Road.

The Town of Clinton owns over 500 acres of land and reservoirs in the vicinity of the Wekepeke Aquifer. The primary surface waters owned by the Town of Clinton include the Heywood Reservoir (which extends into Leominster), Fitch Basin, Upper & Lower Lynde Reservoir, and Spring Reservoir. These lands, referred to as the "Wekepeke Watershed Lands," are denoted as "Town of Clinton" on the Open Space Inventory Map as well as the Water Resources Map. The Town of Clinton has not used this municipal water resource since the mid-1960's and Clinton draws its current water supply from the Wachusett Reservoir. The Heywood Reservoir lies less than 200 yards away from Leominster's Fall Brook Reservoir, which constitutes part of Leominster's municipal water supply. The City of Leominster's past efforts to negotiate surface water rights to the Heywood Reservoir with the Town of Clinton have failed to-date.

Judicious management of the Wekepeke Watershed Lands is also important to Leominster and Lancaster since the Wekepeke Brook and aquifer extends northerly along I-190 near Jungle Road. The City of Leominster maintains a well field near the south end of Jungle Road near the intersection of Interstate 190 and Route 117, as shown on the Water Resource Map. As of 2002, Leominster only utilized this groundwater source to serve demands during peak season. The Town of Lancaster has reportedly performed exploratory drilling for a potential well field in the Wekepeke Aquifer. The Town of Sterling performed exploratory drilling along the Wekepeke Aquifer in the past, but deprioritized this option in the past due in part to projected costs of land acquisition and utilities infrastructure associated with the envisioned well field.⁴⁴ However, the Town has not ruled out the Wekepeke as a potential future municipal water resource.

As discussed previously, Nestle's Waters North America had conducted well tests near the Lynde Reservoir (east of Heywood Road) in 2007 and submitted a formal bid to the Town of Clinton in 2008, which met with intense opposition from Sterling residents, and led the Town of Clinton to reject the bid. In 2009, MassWildlife succeeded in securing permanent protection of the Wekepeke Watershed Lands through a conservation restriction.

Based on findings in a 2002 Hydrologic Analysis (inflow/outflow) by Camp Dresser & McKee (CDM), under contract with the Executive Office of Environmental Affairs (EOEA) for the Massachusetts Watershed Initiative Nashua Team, the Wekepeke sub-watershed at that time was under a medium level of stress.⁴⁵ By definition, this means that the net outflow from the sub-watershed equals or exceeds the estimated lowest consecutive 7-day stream flow that is likely to occur in a ten-year period in a particular river segment (the "7Q10"). The calculated 7Q10 Virgin flow (undeveloped or pre-development) is 0.125 MGD (million gallons per day) and the existing 7Q10 is -0.712. The negative value indicates that a groundwater recharge scenario is predicted. That is, the Wekepeke Brook would actually draw water from the aquifer to maintain its flow during a 7Q10 drought event. *The data indicates that the unique coldwater brook habitat of the Wekepeke Brook is at risk during drought events.*⁴⁶ Although MassWildlife monitors this coldwater habitat, the coldwater fisheries and habitat do not have protected status. The calculated average August virgin flow of the Wekepeke Brook is 5.254 MGD and the existing average August flow is 4.416 MGD—a deficit of about 15%. The calculated 2020 average August virgin flow remains the same at 5.254 MGD and the 2020 average August flow is 4.211 MGD—a deficit of about 20%. The 2020 projections are only based on census statistics and do not include the potential impact of increased industrial development in the region of the aquifer or municipal consumption aquifer's limited water supply⁴⁷.

⁴³ 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁴⁴ Based on input from Lou Manring, Sterling DPW, 2002.

⁴⁵ Study data initially attained in 2002 from JoAnne Carr, past Nashua Basin Team Leader at EOEA MA Watershed Initiative via phone and email communication. Final report entitled "Hydrologic Assessment of the Nashua River Watershed," engineering study, June 2002, Camp Dresser & McKee.

⁴⁶ "Hydrologic Assessment of the Nashua River Watershed", Camp Dresser and McKee, 2002.

⁴⁷ Ibid, 2002

As of 2008, the Sterling DPW was considering future water resources located east of Chace Hill Road within the Nashua River Watershed.⁴⁸

Water supply contamination risks:

According to the 2002 Source Water Assessment and Protection (SWAP) Report for the Sterling Water Department,⁴⁹ the susceptibility of all wells named in the report was classified as “high.” Although this does not imply poor water quality, it does indicate that the named water sources had a high “potential to become contaminated due to land uses and activities within its recharge area”. The same report indicated that the Town of Sterling does not “own or control the entire Zone I” area within the Town. As the Water Resource Map shows, the Zone I for the Worcester Road well field extends across State Route 12 near the Greenland Road intersection.

According to the Sterling DPW website,⁵⁰ Sterling DPW tests the Town’s drinking water for over 140 different contaminants taking over 200 water samples annually. The well water is treated with potassium hydroxide to raise the pH from a typical range of 5.8 to 6.2 (slightly acidic source) upward to a target of 8.2 which is less corrosive to both service lines and household plumbing. The potassium hydroxide treatment also reduces concentrations of lead and copper in the drinking water supply.⁵¹

An ultraviolet water disinfection system went on line at the West Sterling wellfield in 2002 and the Worcester Road wellfield in 2008. This disinfection system minimizes the level of bacteria, parasites, and other pathogens by impeding their ability to reproduce. The decision to install the ultraviolet system was partly in response to pathogen problems attributed to beaver activity near the well field. According to an article related to the incident,⁵² “Sterling’s wells showed low levels of E. Coli and other coli form bacteria. The water department’s first action was to immediately begin emergency chlorination of the water system and issue a boil alert to town residents.” This was the first recorded use of chlorine in Sterling’s municipal water system. As of 2008, the DPW has not added chlorine to the municipal water supply since the installation of the first ultraviolet system.⁵³

The location of Sterling’s light industrial zone relative to the Wekepeke Aquifer, poses potential risks to private and municipal users of the water source and potentially to the Wekepeke Brook. The Zone II aquifer protection area shown on the Zoning & Zoning Overlay Districts maps graphically shows this environmental and water supply risk. The Town’s landfill, which the Town closed and subsequently capped with DEP approval in the early 1990s,⁵⁴ is also located within the Zone II area. As of 2002, a monitoring program was in place to detect the leakage of toxic materials and no known problems were reported.⁵⁵ During 2007, Sterling expanded its light industrial zone to include additional lands along the east side of Route 12, south of Chocksett Road. Much of this land also lies within Zone II water protection areas intended to protect Leominster well field near Jungle Road.

Although it has not been a problem with the municipal water supply, arsenic has been detected in private well water of some Sterling residents.⁵⁶ Potential sources of this element include natural deposits that are accessible in bedrock wells and contamination from orchard chemicals, treated lumber, and manufacturing processes. In New England, low to moderate (1 to 50 micrograms per liter) concentrations of arsenic are known to occur in ground water. In-

⁴⁸ 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁴⁹ See <http://170.63.97.68/dep/water/drinking/2282000.pdf>. Wells named in the report include Worcester Road #2 as well as Redemption Rock #3, #4, and #5. Well #2 has since been replaced with newly drilled wells #2A, #2B and #2C as of 2008.

⁵⁰ <http://www.sterlingdpw.com/Water.htm> accessed on August 28, 2007, web page last modified: July 12, 2007.

⁵¹ 2006 Annual Drinking Water Quality Report for the Town of Sterling (DEP PWSID # 2282000) downloaded from www.sterlingdpw.com on August 28, 2007.

⁵² “River Contaminates Town’s Water Supply When State Leaves It to Beavers” by Louis Manring (past Sterling DPW Superintendent), *Water Engineering & Management* July 2002, Volume 149, Number 7, accessible online as of August 29, 2007. See <http://www.wqpmag.com/wqp/index.cfm/powergrid/rfah=%7Ccfap=/CFID/1961414/CFTOKEN/94417758/fuseaction/showArticle/articleID/3199>

⁵³ Per 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁵⁴ According to Lou Manring of Sterling’s DPW, the capping effort was formally completed in September, 1991.

⁵⁵ Based on June, 2002 input from Sue Valentine of the Sterling Conservation Commission and Lou Manring of the Sterling DPW.

⁵⁶ Based on personal communication with Allen Hoffmann, Sterling Department of Health.

creasing evidence indicates that the source of the arsenic in New England is predominantly natural, originating from minerals within the rocks of the region.⁵⁷ A recent USGS study has validated earlier references on this topic.⁵⁸

Pending significant reductions in the allowable amounts of arsenic contamination in well water⁵⁹ has the potential to limit the number of future wells approved by the Board of Health. Since existing wells are not subject to Board of Health re-inspection even at the time of home resale, it is critical that homeowners be aware of the potential health risks private well water may bring. Engaging homeowners in voluntary monitoring of their wells for arsenic will both facilitate this education and provide a baseline for mapping the extent of the problem and its source. The Town could seek support from the Executive Office of Environmental Affairs to both sponsor the volunteer monitoring program and provide guidance or technical assistance.

By comparison, the Nashua River Watershed is afforded a lower level of watershed protection through the Massachusetts Rivers Protection Act (RPA) and especially the Massachusetts Wetlands Protection Act (WPA) which restrict certain activities around surface water resources ranging from rivers to swamps. The non-profit Nashua River Watershed Association (NRWA) monitors the Nashua River Watershed.⁶⁰

c). Sewage Management

Throughout the town, wastewater management is comprised entirely of septic systems, except at the Waushacum Village campground site, the Chocksett Crossing 40B development, and the Sterling Nursing Home located along Dana Hill Road in Performance Zone One. To date, the Town has rejected all alternatives for sewage other than onsite subsurface disposal systems due in part to costs and the potential for dramatic changes in development patterns.⁶¹

The 2002 OSRP had an action to develop a wastewater management plan to update the Anderson Nichols study and reevaluate the need for sewer connections in selected areas of Sterling in light of improved technologies. Although the Town needs to identify a means to address the problem at the East Lake Waushacum, and the downtown area has a temporary interim mitigation, which the Town may need to address for the businesses and homes there in the near future, there are no plans at this time. The Town may want to review prior Community Development Block Grant applications for infrastructure improvement to determine why they were not funded and how they could be improved for reconsideration. The Town could apply for a block grant to establish a septic management program to address failing septic systems around the lake or to develop a solution similar to that employed at Waushacum Village. The Board of Health, the Conservation Commission, and the DCR-DWSP would need to be involved in these discussions, as would other entities.

Economic development goals and continued growth pressure may necessitate a change in perspective in the future. The Anderson Nichols study predates current technology and the economic and demographic characteristics of Sterling, and future growth pressure may force the town to consider alternatives to achieve its future economic goals. It may prove prudent to reexamine developing access to sewer systems of neighboring towns to support industrial development in the industrial zone as a protection for the Wekepeke Aquifer. A Wastewater Management Plan may be needed as current demographic trends and new development continues. Such a plan should consider the potential future outlined in the EOEEA sponsored buildout analysis conducted in 2001 by the Montachusett Regional Planning Commission, as well.

⁵⁷ Joseph D. Ayotte, Denise L. Montgomery, Sarah M. Flanagan, Keith W. Robinson, and Laura Hayes, *Arsenic in Ground Water in Eastern New England: Occurrence, Controls and Implications for Human Health*, U.S. Geological Survey, 361 Commerce Way, Pembroke, NH, 03275.

⁵⁸ “‘Arsenic Belt’ Subject of Study: Tainted Water Sources are Targeted”, by Debbie LaPlaca, *The Worcester Telegram & Gazette*, January 31, 2005.

⁵⁹ Based on input from the Central Massachusetts office of the DEP, a reduction in the MCL from 50 ppb to 10 ppb was being instituted in the 2002 timeframe.

⁶⁰ See www.nashuariverwatershed.org for more information.

⁶¹ Per June, 2002 phone interview with Allen Hoffman, Sterling Board of Health.

4. Long-term Development Patterns

a). Land Use Controls

For many years Sterling's citizens have expressed concern for the rural character of their community. Since 1981, townspeople have voted for several changes in the Town's General and Protective By-Laws. The trend in current laws reflects interest in environmental and agricultural protection.

A Site Plan Review process (Adopted October 5, 1981) provides for general erosion control and more specific requirements for construction involving more than 60,000 square feet. With regard to subdivisions, community and environmental impact statements are required, addressing those subjects specifically required by the Planning Board.

Agricultural Districts General Bylaw (Adopted in 1982) - The Town adopted an Agricultural Districts bylaw offering residents the opportunity to establish agricultural districts, one of the first in the state. The Bylaw provided for an Agricultural District Committee to work on creating the districts. Creation of districts is initiated by petition. Districts must contain at least fifty acres. The bylaw requires assessments of the consequences of public investments, such as infrastructure extensions, land acquisitions, and zoning by-law changes on Agricultural District properties. The bylaw also gives priority for purchase of proposed Agricultural Preservation Restrictions to property located in an Agricultural District.

Flood Plain Overlay District (Adopted April 26, 1982) - The Town established a Flood Plain Overlay District that requires conformance with the state building codes and is based Federal Emergency Management Act Flood Insurance Rate Maps. The Overlay District consists of Zone A and A1-30 on the Sterling Flood Insurance Rate Maps, and the Flood Boundary and Floodway Maps on file with the Town Clerk, the Planning Board, and the Building Inspector. The District rules prevent any encroachment of land within the 100-year flood boundary. (See Zoning and Zoning Overlay Districts Map, Appendix A)

Multi-Family Development (Adopted April 26, 1982) - Multifamily structures are currently only allowed by special permit and are not to exceed eight dwelling units per structure. This bylaw specifies the design requirements for multifamily developments, and specifically provides that at least 60% of the development will be maintained as open space to be used for conservation, recreation, agriculture, horticulture, forestry or a combination of these uses. At least 40% must be contiguous open space. Issuance of the Special Permit is contingent upon the findings of the Board of Appeals.

The Stillwater River Protection Overlay District (Adopted September 22, 1986) – This bylaw protects the waters of the Stillwater River, Justice Brook and Stuart's Pond, as well as their contiguous wetlands, with a 100 foot buffer landward from each bank. The Conservation Commission issues determination of whether or not a proposed activity or an area is subject to this by-law. This bylaw prohibits new construction within 100 feet landward of either bank, dumping, filling, dredging, and clear cutting.

The Aquifer and Watershed Protection Overlay District (Adopted May 20, 1993) - The Sterling Protective By-law includes a provision for an Aquifer and Water Resource Protection District that protects the groundwater quality of the portions of the Stillwater Aquifer that have a potential well yield greater than one hundred (100) gallons per minute. It also protects all areas in the Town that are either within a delineated Zone II or within a ½-mile radius of municipal wellheads lacking a Zone II delineation. This includes the Wekepeke Aquifer within Sterling and encompasses the entire Industrial Zone of the Town. Permitted uses are subject to special permit approval to ensure conformity with the bylaw. Noxious uses are prohibited. Yet, according to the Planning Board, the development potential is only constrained by fifty percent within the overlay district, as determined from the recent buildout analysis by the Montachusett Regional Planning Commission.

Rate of Development Limitation (Adopted May 11, 1998) – phases growth to prevent straining the Town's ability to provide basic public facilities and services, to provide the town boards information, time, and capacity to incorporate the growth into the Master Plan, and to preserve and enhance the existing community character and the value of property. The bylaw limits issuance of building permits for new residential construction to 30 units in each of five full calendar years following adoption of the bylaw. The five year period recently expired and the town voted to renew it for another five years.

Subdivision Phasing (Adopted May 11, 1998) - phases growth to prevent straining the Town's ability to provide basic public facilities and services, so that it will not disturb the social fabric of the community, so that it will be in

keeping with the community's desired rate of growth, and so that the town can study the impact of growth and plan accordingly. The bylaw limits issuance of building permits on any tract of land to seven permits in any twelve month period, except through special permit where the benefits of the project greatly outweigh the adverse effects to the town.

Scenic Roads General Bylaw (Adopted 1999) – this bylaw authorizes the Planning Board to adopt reasonable rules and regulations for their administration of MGL Chapter 40 Section 15C. It also establishes a fine of \$300 for each violation of the law. Each tree cut or removed constitutes a separate violation. Any repair, maintenance, reconstruction, or paving work done on designated scenic roads requires prior written consent of planning board after a well publicized public hearing for the cutting or removal of trees, or the tearing down or destruction of stone walls.

In 1997, the building lot size was increased from 1 acre to 2 acres in the rural neighborhood zone. Two acre zoning promotes suburban sprawl, but offers enough space to accommodate adequate septic systems. Most of Sterling's approximately 2,200 housing units are single-family homes, about evenly divided between one-half and one acre lot locations. Many downtown properties are running into Title V problems when selling the property, due to small lot sizes in the downtown area. Although the town's zoning by-law considers one acre to be low-density, one acre is too small for successful onsite sewage disposal under less than ideal soil conditions. Such conditions tend to prevail throughout much of the town. If the expense of installing a central sewer system is to be avoided, public health guidelines should include provisions for larger lot sizes depending on soil conditions for septic systems.

Nationally, interest in clustered developments or attached dwelling units for new housing has grown, since the traditional single family home has become too costly for most families to afford. These forms of housing, if well designed, can result in more effective land use, providing necessary housing on lesser amounts of land. They can utilize specially designed septic systems. In return for permitting increased density, town officials could require that developers set aside associated land for conservation. Many towns have adopted this practice, in order to retain a rural atmosphere while accommodating growth. Yet, many towns have encountered opposition to cluster development for because of community perceptions associated with denser development.

As an alternative, subdivision developments can use the guidelines for Open Space Residential Design. These designs relax the dimensional requirements for individual lots in exchange for open space set-asides that allow for public parks or conservation land. By allowing the homes to be built in close proximity, more compact and practical infrastructure systems can be built to manage septic wastes and stormwater runoff efficiently and with less environmental impact. Under OSRD, the Town delineates the land it wants protected ahead of the developer designing the infrastructure and lot delineation, with a focus on preserving the best aspects of the land area in exchange for a higher density to reduce the infrastructure costs. The Town ensures preservation of the lands it values and the developer receives a return on investment that makes the project viable to complete.

At the time of the 2002 OSRP, the Conservation Commission had submitted a proposal for a new Conservation By-law, and worked to develop a base of support for its passage. The by-law was brought to Town Meeting for voter approval, but the language of the proposed bylaw was defeated. The Conservation Commission is interested in reintroducing a revised conservation bylaw. The bylaw would enhance the protections established by the Wetlands Protection Act, the Rivers Protection Act, the Watershed Protection Act, and the Clean Water Act. Its purpose is to protect the wetlands, water resources, and adjoining land areas in the Town by controlling activities deemed likely to have a significant or cumulative effect upon resource area values. It would prohibit removal, fill, dredging, construction, degrading, and discharge into wetlands, marshes, wet meadows, bogs, swamps, vernal pools, banks, reservoirs, lakes, ponds, rivers, streams, creeks, beaches, lands under waterbodies, lands subject to flooding, and lands abutting these resources. The Conservation Commission would be given jurisdiction over implementation of the bylaw. Agricultural uses would be exempt, as per the Wetlands Protection Act (310 CMR 10.04). The bylaw establishes a permitting procedure that is required for any plans filed under the Wetlands Protection Act. It also establishes a fee structure covering advertising, assessment, and wetlands impact per square foot of wetlands altered, as well as a fee to cover expenses born by the Conservation Commission for procuring consulting services for analysis of site impacts.

b). Growth Management Strategies

In Sterling, a good example of conservation protection associated with land development is *the Wheaton-Jones Protective Covenants* for subdivided land on East Lake Waushacum, which, required that an owner could clear no more than half of each lot, and could erect no building within 100 feet of the lake. A 60-foot band of undisturbed

vegetation must remain along the shore, although an owner could alter 50 feet of Lake Frontage for access to the lake. East Lake Waushacum Association oversaw compliance with the covenants, which expired on June 16, 2002.

Most farmland in Sterling is under the Chapter 61A program for agricultural tax assessment, a strong indication of the concern for the future of farming in town. However, Chapter 61A does not provide permanent protection for farmland; landowners can change the use after paying a conveyance or rollback tax. **Conservation restrictions** can provide more lasting protection. By relinquishing the development rights through a conservation restriction, a landowner can continue to farm while enjoying reduced property taxes and a reduction in income taxes equal to the value of the restriction if it is given to a conservation organization.

The state offers an **Agricultural Preservation Restriction (APR)** program through Chapter 780, providing funding for the purchase of development rights on actively farmed, high-quality land threatened by development. Competition is strong for these funds. Although the state provides the major portion, local contributions are required toward development rights purchases. If a town is not in a position to expend funds for this end, owners of the land involved can make a gift of the difference between the appraised development value and the state's investment. The support of the local boards and commissions helps in the success of applicants for APR monies. Three farms in Sterling currently participate in this program.

Priority lands for agricultural protection restrictions should be determined, so that appropriate actions may be taken as applicants are made. In 1983, Sterling volunteered to participate in a program of **Land Evaluation and Site Assessment (LESA)** offered by the Natural Resources Conservation Service as a means for setting priorities for farmland protection. LESA offers a technical framework to numerically rank land parcels based on local resource evaluation and site considerations. In agricultural land evaluation, soils are rated and placed into groups ranging from the best to the least suited for a specific agricultural use, such as cropland, forestland, or rangeland. Site assessment includes non-soil factors related to agricultural use of a site, factors related to development pressures, and other public values of a site. Then, a relative value is determined for each group. For example, the best group may be assigned a value of 100, while all other groups are assigned lower values.

In 2002, the Federal Legislature passed the **Farm Security and Rural Investment Act**, which establishes a number of conservation resources to aid farmers in dealing with issues such as soil erosion, wetlands, wildlife habitat, and farmland protection. These resources consist of several voluntary programs that offer technical and financial assistance to farmers to encourage environmentally sound solutions to preserving agricultural resources. The programs are as follows:

The **Conservation of Private Grazing Land Program** (CPGL) helps owners and managers of private grazing land address natural resource concerns while enhancing the economic and social stability of grazing land enterprises and the rural communities that depend on them.⁶²

The **Conservation Security Program** provides financial and technical assistance for the conservation, protection, and improvement of soil, water, and related resources on Tribal and private lands. The program provides payments for producers who historically have practiced good stewardship on their agricultural lands and incentives for those who want to do more. The program will be available in fiscal year 2003.⁶³

The **Environmental Quality Incentives Program** (EQIP) is a voluntary conservation program that promotes agricultural production and environmental quality as compatible National goals. Through EQIP, farmers and ranchers may receive financial and technical help to install or implement structural and management conservation practices on eligible agricultural land.⁶⁴

The **Farmland Protection Program** helps farmers and ranchers keep their land in agriculture. The program provides matching funds to State, Tribal, or local governments and non-governmental organizations with existing farmland protection programs to purchase conservation easements or other interests in land.⁶⁵

The **National Natural Resources Conservation Foundation** (NNRCF) promotes innovative solutions to natural resource problems and conducts research and educational activities to support conservation on private land. The

⁶² <http://www.nrcs.usda.gov/programs/cpgl/>

⁶³ <http://www.nrcs.usda.gov/programs/CSP/>

⁶⁴ <http://www.nrcs.usda.gov/PROGRAMS/EQIP/>

⁶⁵ <http://www.nrcs.usda.gov/programs/frpp/>

NNRCF is a private, nonprofit 501(c)(3) corporation. The foundation builds partnerships among agencies and agricultural, public, and private constituencies interested in promoting voluntary conservation on private lands.

The **Community Preservation Act (CPA)** is a state law (G.L. Ch. 44B) passed in September 2000 giving cities and towns a new funding source for protecting open space and historic properties, and creating affordable housing. The goal of the CPA is to preserve the character of our communities by addressing sprawl, the rapid loss of remaining open land and historic landscapes, and the need for housing affordable to town employees, senior citizens and others. Local priorities are researched and acquisitions and expenditures recommended by a Community Preservation Committee.⁶⁶ Specifically the funds are for:

- acquisition, creation, and preservation of **open space**. Open space includes land to protect existing and future wellfields, aquifers and recharge areas, watershed land, agricultural land, grasslands, fields, forests, fresh and salt water marshes and other wetlands, frontage along the ocean and other water bodies, beaches, dunes and other coastal lands, scenic vistas, wildlife/nature preserves and land for recreational use. Land for recreational use here includes land for active or passive recreation e.g. community gardens, trails, parks, playgrounds, and athletic fields - but not stadiums, race tracks for animals, gymnasiums or similar structures.
- acquisition and preservation of **historic resources**. This includes structures, vessels, and landscapes eligible for listing on the state register of historic places or determined by the local historic preservation commission to be significant to local history, archeology, architecture or culture.
- creation, preservation and support of **community housing**. Affordable community housing includes low and moderate-income housing for individuals and families, and includes senior housing.

Funding is a combination of locally raised money and a match provided by the state. The State matches local funds with funds raised through surcharges on filing fees in the Registry of Deeds and the Land Court. The town meeting must vote to adopt the statute and specify the level of the surcharge added to the real estate property tax (up to 3%) and the exemptions to the surcharge. Then there is a vote on a ballot question at the next regular state or municipal election to accept the CPA in the form voted by the legislative body. If it passes, the town meeting creates a Community Preservation Committee (CPC) of five to nine members, with representation of the Conservation Commission, the Planning Board, the historic commission, the housing authority, and the park commission (DPW), through a bylaw or ordinance.

The locally raised surcharge money is placed in a Community Preservation Fund. The state money is placed in the Community Preservation Trust Fund administered by the Department of Revenue. After disbursal each October, the town places the state money in its Community Preservation Fund.

The deed transaction fees could generate about \$25 million annually. Gifts, settlement, and other monies can also contribute to the fund. Eighty percent of the money received by the state fund each year will be distributed to participating communities as a percentage of the money they have raised locally. Each community will receive the same percentage match. The other twenty percent of the state money will be distributed according to a formula spelled out in the statute; the formula for this portion is based on population and property valuation criteria, and favors smaller and poorer communities.

Despite support for the Community Preservation Act at the Annual Town Meeting, residents of Sterling voted against it on a ballot question at general election in 2006. Some voters felt that the complexities of state funding programs limit the local control, and that the Town should raise money for land preservation independently. Others felt that the Town generally accommodates appropriations for land purchases when they come before Town Meeting and that there was no need for a dedicated fund.

Coincidentally, two other ballot questions asking the town to purchase Chapter 61A land parcels failed. One, a 15-acre parcel on Swett Hill Road, would have protected important uplands of the East Lake Waushacum watershed. The other, a 20-acre property on Meetinghouse Hill Road, included wetlands and a historic yellow barn, and would have supported both passive and active recreation. Total cost to acquire the two parcels was \$370,000. For the property at East Lake Waushacum, the Conservation Commission had offered \$20,000, and the East Lake Waushacum Association had offered an additional \$3,000. The Town had sought additional funding for the parcel through a state grant program.

⁶⁶ Massachusetts Association of Conservation Commissions, *Questions and Answers Concerning The Community Preservation Act* http://maccweb.org/q_a-cpa.html.

The value of the Conservation Preservation Act is that it would help the Conservation Commission and the Town to prepare for opportunities to acquire lands, such as those coming out of the Chapter 61 tax abatement programs, as the opportunities arise.⁶⁷ If purchase decisions must wait until Town Meeting appropriations are approved and passed on ballot questions, then many opportunities that come before the town could be missed due to a limited window of opportunity to exercise the Town's right of first refusal. The Community Preservation Fund would create a dedicated resource that could strengthen the Town's ability to preserve its natural cultural and historic heritage. The Sterling Open Space and Recreation Committee should work on educating people about the Community Preservation Act and its value to the town as a source of funding for acquiring land for conservation as the need arises, and make another attempt at adopting the Act.

c). Scheduled and Proposed Development Projects

The Planning Board has indicated that there are no scheduled development projects. There have been two preliminary proposals for Chapter 40B affordable housing subdivisions. At present, these proposals are in stasis, and the town has taken no action regarding them. The growth rate limitation of 31 new units per year will dictate a slower rate of growth for at least another five years.

Planned Expansions to Infrastructure

Water resources are a critical limiting factor of growth potential for the Town. New developments at elevations above 655 feet increased the demand for water and brought the Town to investigate the benefits of expanding the municipal water supply infrastructure with an expensive, secondary pumping system, ensuring water service at a DEP-recommended water pressure of 35 psi.^{68,69} Projections of future needs from the recently updated Waterworks Facilities Master Plan (2006) have prompted the Town to consider both town-owned lands and DCR-owned lands for possible well sites in future years. In 2002, the Town assessed the potential for an alternative well field location along Muddy Pond Road directly across from Muddy Pond. At present, the Town is considering Nashua River Watershed alternatives such as the Wekepeke Aquifer, water resources located east of Chace Hill Road,⁷⁰ and the unused Town of Clinton Wekepeke Watershed Lands (the Heywood Reservoir, Fitch Basin, Upper & Lower Lynde Reservoir, and Spring Reservoir). The Sterling DPW also expects to update its Source Water Protection Plan with the support of Massachusetts Rural Watershed Association.^{71,72}

Heywood Reservoir, in the Town of Clinton reserve supply system, lies at the headwaters of Wekepeke Brook, less than 200 yards away from Leominster's Fall Brook Reservoir which is actively used for Leominster's municipal water supply. The City of Leominster's past efforts to negotiate surface water rights to the Town of Clinton's Heywood Reservoir have failed to-date.⁷³ Intense opposition from Sterling residents to Nestle's use of the Wekepeke Aquifer for commercial purposes and the recent conservation restriction granted to MassWildlife⁷⁴ for acreage surrounding the reservoir effectively reduced concerns for the protection of the Heywood Reservoir; though the CR does not affect the right of the Town of Clinton to tap its water supply.

Tapping the aquifer underlying the Wekepeke Brook would require sensitivity to flow conditions and other environmental factors. The Town monitors its closed and capped landfill, which is located adjacent to the aquifer, to detect the leakage of toxic materials. Efforts to identify water sources in the aquifer should consider the findings of the Camp Dresser and McGee Hydrologic Assessment of the Wekepeke Aquifer (2002), which indicated that the Wekepeke sub-watershed was under a medium level of stress, and that the Wekepeke Brook would actually draw water from the aquifer to maintain its flow during a 7Q10 drought event. This condition would place the unique

⁶⁷ The Landmark, *Preservation and Land Articles Fail at Polls After Town Meeting Success*, May 24, 2001

⁶⁸ Waterworks Facilities Master Plan, Town of Sterling, Compiled by Fay, Spofford & Thorndike, February, 2006. Dennis P. Boucher, Registered Civil Engineer.

⁶⁹ Per 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁷⁰ 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁷¹ Per 2008 interview with Mark D. Semenuk, Sterling DPW Water Foreman, by Brian Cline, 7/11/08.

⁷² See <http://www.massrwa.org>

⁷³ Per Matt Marro of the Town of Leominster.

⁷⁴ Chapter 289 of the Acts of 2004--An Act Authorizing the Division of Fisheries and Wildlife to Take or Acquire Conservation Restrictions in and to Lands of the Town of Clinton. See link to enabling legislation <http://www.mass.gov/legis/laws/seslaw04/sl040289.htm> which includes reference to the Clinton-owned "Wekepeke Watershed Lands" within Sterling and Leominster.

coldwater brook habitat at risk during drought events.⁷⁵ Deficit flow conditions and the location of Sterling's industrial zone relative to the Wekepeke Aquifer, pose potential risks to users of the water supply and to the Wekepeke Brook. The wellfield off Jungle owned by the City of Leominster road can only supply a safe yield of 0.3 MGD, and the City only taps them during peak season.⁷⁶ The Town of Sterling has performed exploratory drilling along the Wekepeke in the past, but has generally tabled this option due in part to projected costs of land acquisition and utilities infrastructure associated with the envisioned well field.⁷⁷

The Town should make a concerted effort to study the opportunity costs of certain types of development along the Wekepeke aquifer given the results of the Camp Dresser and McKee Study. In addition, it may be critical for Sterling to collaborate with the City of Leominster and the Town of Clinton in cooperative efforts to protect both surface and ground water resources for the integrity of the Wekepeke Aquifer and the health of the trout and other wildlife habitats of the Wekepeke Brook. Sterling leaders may also want to spearhead a volunteer monitoring program in search of arsenic in private well water.

The northern and western sections of Town will likely need to rely on private wells for the long term until Town identifies viable source water alternatives or a secondary pumping station can be built. Careful attention should be given to the installation of septic systems in these areas to prevent contamination of on-lot wells.

For the foreseeable future, the town will continue to manage septic disposal with private onsite subsurface disposal systems. To date, the Town has rejected all alternatives for sewage management other than onsite subsurface disposal systems, except for the package treatment facilities at the Waushacum Village campground site, the Chocksett Crossing 40B development, and the Sterling Nursing Home on Dana Hill Road in Performance Zone One, due in part to costs and the potential for dramatic changes in development patterns.⁷⁸

Although the Town needs to identify a means to address the problem at the East Lake Waushacum, and the downtown area has a temporary interim mitigation, which the Town may need to address for the businesses and homes there in the near future, there are no plans at this time. The 2002 OSRP had an action to develop a wastewater management plan to update the Anderson Nichols study and reevaluate the need for sewer connections in selected areas of Sterling in light of improved technologies. Economic development goals and continued growth pressure may necessitate a change in perspective in the future. The Anderson Nichols study predates current technology and the economic and demographic characteristics of Sterling, and future growth pressure may force the town to consider alternatives to achieve its future economic goals. It may prove prudent to reexamine developing access to sewer systems of neighboring towns to support development in the industrial zone as a protection for the Wekepeke Aquifer. The Town may want to undertake a Wastewater Management Plan that considers current demographic data and new development and the potential future outlined in the EOEa sponsored buildout analysis conducted in 2001 by the Montachusett Regional Planning Commission.

The Town may want to review prior Community Development Block Grant applications for infrastructure improvement to determine why they were not funded and how they could be improved for reconsideration. The Town could apply for a block grant to establish a septic management program to address failing septic systems around the lake or to develop a solution similar to that employed at Waushacum Village. The Board of Health, the Conservation Commission, and the DCR-DWSP would need to be involved in these discussions, as would other entities.

⁷⁵ JoAnne Carr, Nashua Basin Team Leader at EOEa MA Watershed Initiative.

⁷⁶ The Leominster water system has seven surface reservoirs and three groundwater wells. Leominster also maintains a connection to the Wachusett Reservoir to supplement the city system. The wells that tap the Wekepeke Aquifer are used to augment local surface water supplies, when necessary.

⁷⁷ Based on input from Lou Manring, Sterling DPW.

⁷⁸ Per June, 2002 phone interview with Allen Hoffman, Sterling Board of Health.

d). Buildout Analysis

In 2001, the Executive Office of Environmental Affairs (EOEA) sponsored the creation of buildout analyses for all 351 towns and cities within the Commonwealth of Massachusetts in support of the Community Preservation Act.⁷⁹ At the local level, EOEA believes that community preservation is about maintaining quality of life in our municipalities by empowering cities and towns to preserve what is important to their individual character. This community preservation effort is also about recognizing the potential negative effects of sprawl development, and the potential for disproportionate growth in certain regions. EOEA contracted with the Montachusett Regional Planning Commission to develop buildouts for the communities in its region.⁸⁰

Buildout analyses illustrate the maximum development permitted as-of-right by the local zoning bylaws in place at the time of the analysis. The buildout provides an estimate of the total number of houses and commercial/industrial square footage that could result if every piece of unprotected, buildable land is developed, if no more land is permanently protected within a community, and if zoning remains unchanged. In addition, the buildout can provide insight to the potential burdens on community infrastructure. That is, the analyses used a projected growth rate based upon past growth trends, population forecasts and economic forecasts, communities can anticipate the length of time needed to reach buildout and to reach certain growth thresholds such as when additional schools, water supplies and sewer systems will be needed. This information can provide a framework for planning future community budgets as well.

The methodology defines buildable land as undeveloped, un-protected, upland that does not include transmission lines or land within 100 feet of a stream or river. The analysis reflects a community's zoning bylaws and regulations, especially concerning the way they treat resource areas such as wetlands and floodplains. For example, if wetland areas can be included in gross building-lot area minimums, then wetlands are not considered an absolute constraint to development. Yet wetlands may be considered partial constraints if they restrict the density or type of development in a given area. For example, there may be a 25% limit on all impervious surfaces on parcels located within a certain distance of a wetland. The methodology takes this into account.

For Sterling, the MRPC conducted interviews with the Planning Board to develop a set of assumptions regarding the types and intensity of future developments anticipated that were built into the analysis. Environmental constraints were taken into consideration including the 0-200' Rivers Protection Act buffer, the 100-Year flood plain buffer, Wetlands, The Aquifer Overlay District (Greater than 100 gallons per minute yield), and The Watershed Protection District River Buffers (0'-200' River Buffers). The analysis also incorporated the views of the Planning Board regarding the level and amount of development permitted in these environmental buffer zones. Absolute Constraints to development included the 100 yr Floodplains, the Rivers Protection buffer of 0-200 feet inside the Wachusett Watershed and of 0-100 feet outside the Watershed. Partial constraints included Wetlands and Aquifers of yield >100 gpm, both of which were assumed to constrain development by 50 percent. Outside the Watershed, the Rivers Protection Act buffer of 100-200 feet was assumed to constrain development by 20 percent.

Dimensional requirements for residential districts established the criteria for determining the potential number of new housing units and their impacts on the town's infrastructure. Nearly 88 percent of the Town is zoned as rural residential. Sterling has a two-acre minimum for single-family house lots in its rural residential zone. Two-family homes require two and one-half acre minimum lot sizes. The town also requires significant frontage for each lot, at 225 feet for single-family lots and 270 feet for two family lots. In addition, there is a maximum limit of 650 feet for the length of a cul de sac street. This requirement limits lot creation on a cul de sac to six lots.

⁷⁹ Executive Office of Environmental Affairs, Community Preservation Initiative at <http://commpres.env.state.ma.us/content/buildout.asp>.

⁸⁰ For more information on the buildout analysis project see the Executive Office of Environmental Affairs website on the Community Preservation Initiative at <http://commpres.env.state.ma.us/content/buildout.asp>. Also check out their publication, *The Buildout Book: Where Do You Want to be at Buildout?*, available in PDF format to either read or print from the website. Additionally, the buildout map series and analysis for Sterling are also available in both PDF and ArcView format on this web site.

Table 3-16: Dimensional Regulations for Residential Development

Residential Zoning	Minimum Lot Size	Frontage	R.O.W.	Units per Lot
Rural Residential (RR)				
Single Family	87,120	225	40'	1
Two Family	108,900	270	40'	2
Neighborhood Residential (NR)				
Single Family	21,780	125	40'	1
Two Family	43,560	185	40'	2

Source: Sterling Protective Bylaw

Commercial and industrial buildable lots were determined using an "effective" floor area ratio. For the Neighborhood Commercial, General and Industrial zoning districts, the major alternative land uses were examined in relation to height, maximum lot coverage and parking requirements. An effective floor area ratio (FAR) for all use categories (e.g. offices, warehouses) in a particular district was developed for analysis purposes. The effective FAR for the entire district was estimated by averaging the FARs for the various potential land use types. Limits placed on the total square footage of a building because of environmental constraints were also taken into account. The Commercial and Town Center Districts were considered built out already.

The buildout calculations yielded a figure of 7,016 acres of developable residentially zoned land and commercial/industrial potential of 12,487,512 square feet of Floor Area. Under the current dimensional requirements, the town could anticipate a maximum of 3,484 new dwelling units. At buildout, the population would increase by 8,232 new residents, based on the 2000 average of 2.36 persons per household. Total population would be 15,489. The student body at buildout would increase by 1,064, based on the 2000 average of 0.305 students per household. The total number of students in town would be 1,886. (See Table 3-12)

The increase in water demand is based upon a residential usage rate of 75 gallons per person per day and a Commercial/Industrial usage rate of 75 gallons per 1,000 square feet of floor space per day. The increase in water demand was added to the reported 1999 consumption rate for the public water system. Data on water consumption from private wells was unavailable. Future water demand is estimated to be 2,114,926 gallons per day. This rate of consumption would max out the current pump rate for the Stillwater River Wellfield. The rate is based upon a statewide average, so if the Town opts to approve commercial land uses that are significantly large consumers of water, a careful balance must be struck between the commercial use and remaining opportunities for residential use.

Table 3-17: Summary of Potential Buildout Impact

Buildout Impact for the Town of Sterling	Current (2000)	Additional	Future
Population	7,257	8,232	15,489
Students	822	1,064	1,886
Households/New Dwelling Units	2,696	3,484	6,180
Water Demand (gallons per day)	561,000	1,553,926	2,114,926
<i>Residential Water Use (gallons/day)</i>	~222,881	617,363	~840,244
<i>Comm./Ind. Water Use (gallons/day)</i>	~338,119	936,563	~1,274,682
Municipal Solid Waste (tons/year)	N/A	4,223	
<i>Non-Recycled Solid Waste (tons/year)</i>	N/A	3,003	
<i>Recyclable Solid Waste (tons/year)</i>	N/A	1,220	
Road Miles	106	75.9	182

Sources: Montachusett Regional Planning Commission, Sterling Planning Board, Sterling Department of Public Works, N/A = these figures were unavailable at the time of printing.

All solid waste estimates are for residential use only. Statistics on the present day volume of solid waste per day were unavailable at the time of the buildout analysis. However, the State provided a formula for calculating the solid waste potential impact based upon the number of new households likely to be built. Non-Recycled Solid Waste was based on 0.3648 tons per person per year and Recyclable Solid Waste was based on 0.1482 tons per person per year. Total expected increase in residential solid waste is 4,223 tons per year.

While the intent of large lot dimension requirements is to ensure proper management of septic wastes, lengthy frontage requirements translate into significant increases of road miles and large conventional lots consume the land and result in a suburban sprawl development pattern. According to the 2000 MassHighway Road Inventory File, Sterling has 106 miles of road, most of which are under the jurisdiction of the Town. At buildout, the total road miles under town jurisdiction would increase by 76 miles, based upon the frontage requirements specified in the dimensional regulations. The estimate of new roads takes into account house lots on both sides of the road and Approval Not Required development on existing ways.

During the last decade the town issued over 500 (690) building permits for new residential construction. Many of these were for housing units that were included in subdivisions. The annualized rate of permit issuance in the Town of Sterling was an average of 50 to 51 units per year. At this rate, the Town would reach residential buildout in less than 70 years (50). The town could anticipate up to 20 new students per year. If the regional growth trends continue, Sterling may also face an increasing rate of growth, as other communities either buildout themselves or restrict their growth. These estimates should be considered with caution, however, as many factors can affect the local economy and growth rate. Land zoned for commercial or industrial uses tend to develop according to the needs and limitations of the regional economy.