

CHAPTER

5

COMMUNITY FACILITIES AND SERVICES

Introduction

The Town of Orange provides many services to residents, businesses, and property owners including the distribution of clean drinking water, the disposal and treatment of wastewater, solid and hazardous wastes disposal, public educational services, fire and safety, highway maintenance, and recreational services. Orange residents pay for these services through their taxes and through water and sewer user fees.

This chapter addresses three major community services: public drinking water supplies, wastewater treatment, and recreational facilities and services. Each of these services is described in the following text and includes goals and objectives, current conditions, issues, and recommendations.

This chapter addresses the complex relationship between a community's infrastructure, the quality of services provided residents, and a town's efforts to manage growth consistent with the conservation of natural, cultural, and recreational resources and the area's ecosystem integrity. Upgrades in services can create improvements in residents' quality of life.

Recreational facilities, especially urban parks, can benefit those residents living in dense neighborhoods lacking natural vegetation and greenery. Public sewer and water infrastructure makes it possible for village centers to include closely spaced businesses and housing. Finally, water and sewer lines can be used to support existing development near environmentally sensitive areas. On the other hand, extending sewer and water lines into undeveloped areas can also result in the development of important natural areas.

This chapter addresses the costs associated with community water and sewer improvements and some of the issues that require resolution before any expansion of community infrastructure can be considered. For example, the Orange sewer collection system is very old. Only 20 percent of the wastewater coming into the sewer plant actually comes from paying customers. The majority of the treated wastewater is actually storm water and groundwater that arrive at the plant via leaking underground sewer pipes and illegal residential tie-ins. Any potential expansion of sewer or water lines would need to be preceded by a significant renovation of the existing sewer collection system.

The following section includes goal and objectives, a description of the community water supply in Orange, its sources, storage, distribution, treatment, revenue source and protection, and a discussion of water supply issues.

Community Water Supply

Through the Orange Water Department, the Town of Orange provides drinking water to residents and businesses in and around Orange Center. The remaining areas of town are all served by individual private wells. Presently, the community water supply in Orange meets current demand and is projected to meet future demand through at least 2020. However, other communities in Franklin County are experiencing shortages in their drinking water supplies, or are concerned about the impacts of future growth on limited supplies. It is important that town officials consider ways to conserve and protect the quality and quantity of their drinking water supplies. Sources of information for this section include the Town of Orange's former Water Department Superintendent, Richard Kilhart; the Massachusetts Department of Environmental Protection; the Orange Open Space and Recreation Plan (2001); and, the Franklin County Regional Water Supply Study (2003). In addition, this chapter reflects the feedback and input of the Master Planning Committee.

Goal and Objectives

Goal

- To safeguard both the quality and the quantity of public and private drinking water supplies.

Objectives

- Explore whether the Town of Orange has access to potential future water supplies via lands that are protected with a conservation restriction.
- Protect the land within the Zone I well head protection areas, as well as the Zone II recharge areas with conservation restrictions to reduce the possibility of water supply contamination from polluted storm water runoff from residential areas and other sources while keeping the land in private ownership and on the real estate property tax rolls.
- Consider amending the zoning bylaws to include more effective non-point source pollution controls within the Water Resource Districts (equivalent to the Zone II recharge areas).
- Plan for the future by identifying potential water supply problems and their solutions, and by establishing contingency plans for emergency drinking water supplies, including the development of alternative community drinking water supply sources.
- Encourage the adoption of Best Management Practices in all public departments, especially for the use of road salt by the State and Town highway departments.

- Support the Board of Health's adherence to Title 5 requirements and encourage the use of alternative septic systems in situations where enhanced wastewater treatment is needed to protect groundwater supplies.
- Consider establishing a growth boundary for future water line extensions consistent with the areas where the Town wishes to direct future development and where the Town wishes to discourage it.
- Explore ways of strengthening the protection of the community water supply e.g., by decreasing development density in the Water Resource Districts for the Zone II Recharge Areas, by using appropriate Best Management Practices, and by educating homeowners and businesses on ways to protect groundwater supplies and resources.
- Identify new sources of drinking water and their recharge areas, and, if necessary, expand the Water Resource Districts to include them.

Community Drinking Water Supply

Orange residents get their drinking water from private wells and public water supplies. Public water supplies are classified as either community or non-community sources. Community sources supply water to a public distribution system like that of the Orange Water Department. A non-community source is one that serves twenty-five or more persons, such as a school, factory, campsite, or restaurant and is not part of a public distribution system (*see the Community Facilities and Services Map at the end of this chapter*).

This discussion of the Town's community drinking water supply will focus on the Orange Water Department's sources (Well #1, #2 and #3), the water distribution system, the delineated recharge areas of the wells, the Department's fee structure, and current drinking water demand. It will also introduce the issues related to conserving the quality and quantity of the drinking water source, both now and in the future.

Orange's Community Water Supply Sources and Storage Capacity

The Orange Water Department's current sources include three wells, which serve residents and businesses in and around Orange Center. Well #1 is located off Holtshire Road, south of Route 2, while Well #2 is located approximately 4,000 feet down gradient of Well #1, and within 850 feet of the Millers River, off West River Road. Well #3 is located east of the intersection of Routes 202 and 122 near the Town's border with New Salem. Wells #1, #2 and #3 together supply water to approximately 3,913 residents (2001) as well as to commercial businesses and industries for a total of 1,754 service connections.

Table 5-1: Data for the Orange Water Department's Community Water Supply System, 2001

	Well #1	Well #2	Well #3
Source(s) Status	Active	Active	Active
Safe Yield	0.432 MG	0.432 MG	0.936 MG
Average Daily Withdrawal	850 gal.	135,332 gal.	485,143 gal.

Source: Massachusetts Department of Environmental Protection; 2002. MG-million gallons.

Well #1, installed in the 1940s, is ten inches in diameter and fifty-four feet deep. It is rarely used due to elevated levels of iron and manganese. This well does not feed into the water distribution system directly. It is used, however, for filling the South Storage Tank, which is a 1.0 million gallon elevated pre-stressed concrete storage tank located on Walnut Hill. The safe yield for Well #1 is 432,000 gallons per day. The safe yield is the amount of water that can be taken from a source over a period of years without depleting that source beyond its ability to be replenished naturally in wet years.

Well #2, installed in 1957, supplies approximately 30 percent of the water used by Orange Water Department customers. It is an eighteen-inch diameter well, approximately eighty-five feet deep. The safe yield for Well #2 is also 432,000 gallons per day.

Well #3, installed in the 1990s, supplies approximately 69 percent of the Orange Water Department's demand for water. It is a 32-inch diameter packed gravel well. The safe yield for Well #3 is 936,000 gallons per day.

The North Storage Tank is associated with Wells #2 and #3, and is located off North Main Street, approximately 500 yards south of the intersection with Oxbow Road and Cross Road. The North Storage Tank also has a capacity of 1.0 million gallons and is an elevated pre-stressed concrete tank. The water level in the North Tank controls Well #2 and #3 pump operations.

Besides these three wells, the Town of Orange also purchases water from the Town of Athol, accounting for 1 percent of Orange's total water use, for forty-six residences in the Tully section of Orange, with a capability of sixty residences maximum.

The Massachusetts Department of Environmental Protection's Drinking Water Program requires Community Public Water Systems to submit Public Water Supply Annual Statistical Reports each year. In 2001, the Orange Water Department reported that its three wells together supplied 226.8 million gallons of water with an average daily withdrawal of 621,325 gallons. Overall, 44 percent of this water went to residential use, 13 percent went to commercial uses, and 5 percent to industrial or agricultural use. Overall, 3 percent was used for maintenance and flushing of the water system, 33 percent was considered unaccounted or was lost due to leaks and other faulty equipment, and 2 percent was used by schools and other transient areas. The registered withdrawal volume for the Orange Water Department is 630,000 gallons per day though it received a permit from the State to withdraw an additional 330,000 gallons for a total of 960,000 gallons per day. The registered withdrawal is the amount the State first allocated the department to withdraw based upon its use records during the 1980s.

The Registration Program was implemented as a result of the Water Management Act (Mass. General Law Chapter 21G) of 1986 which authorized the Massachusetts Department of Environmental Protection (DEP) to regulate the quantity of water withdrawn from both surface and groundwater supplies for the purpose of ensuring adequate water supplies for current and future water needs. It allowed large water users the ability to register their existing water withdrawals based upon their historic use between 1981 and 1985. It allowed for step increases in withdrawals based on population projections. The Water Management Act also resulted in a Permit Program, which was initiated after the Registration Program deadline of January 4, 1988. The Permit Program requires those planning to withdraw water from new ground or surface sources in excess of an annual average of 100,000 gallons per day or 9 million gallons in any three-month period to apply for a Water Management Act Permit. The Permit Program also serves suppliers by allowing them to apply for a permit to increase their regulated withdrawal volumes due to increases in water demand beyond what was expected from the population projections. In addition, a supplier withdrawing more than 100,000 gallons per day in excess of its registered withdrawal volume would be required by the DEP to seek a permit.

Emergency Water Supplies

There are three surface water supplies that are used as emergency drinking water sources by the Orange Water Department. These include Lake Mattawa and the Crystal Spring and Coolidge Brook Reservoirs. Water from Athol, through an eight-inch interconnection, is also available to Orange in the event of an emergency.

Lake Mattawa is located in the southwestern section of Orange. Although it was once connected to the distribution system, that connection was last used in 1933 and is no longer operable. There is no other connection to the current distribution system. As other emergency sources have been deemed adequate to meet the needs of the Town, the cost of a connection to Lake Mattawa is considered an unnecessary expense. If a dire emergency were to present itself, a package treatment plan could be placed at the site and used to treat the water from Lake Mattawa for iron and manganese and then pump it into trucks to haul water where needed.

Crystal Spring Reservoir is located between Holtshire Road and Route 2 in southeastern Orange, next to Well #2. It is close to the distribution system and would require pumping into the system through a hydrant, as well as a package treatment plant to treat the water in order to bring it on line.

The Coolidge Brook Reservoir, also known as Vorces Pond, is located at the northwest corner of Lake Mattawa. Although not connected to the current distribution system, it is estimated that connecting it to the system would take approximately one month. It, too, would need a package treatment plant.

Distribution and Treatment

The Orange Water District has a water distribution system consisting of a main loop circling the center of town with many lateral pipes. The system also contains many dead-ends extending to the outlying areas, as well as three river crossings. The water distribution system (*see Community Facilities and Services Map at the end of this chapter*) serves the following areas in Orange:

- Zoning District A(c) (Village Residential/Commercial);
- Zoning District A(r) (Village Residential) and extending down South Main Street serving both the Orange Industrial Park and Randall Pond Industrial Park;
- The part of Zoning District B (Residential/Commercial) which includes East River Street, Daniel Shays Highway and the western section of Eagleville Road; and,
- Along East Road located in Zone D (Rural Residential) to just south of Bartlett Lane.

The treatment system consists of the addition of potassium hydroxide into the water from all the wells to correct a low pH problem, which can cause corrosion.

Fee Structure

As of September 2003, the water rate is equal to \$2.30 per 100 cubic feet (31 cents for every 100 gallons) of water for the first 25,000 cubic feet used and \$2.40 per 100 cubic feet (32 cents for every 100 gallons) for water use in excess of 25,000 cubic feet (100 cubic feet is equal to 748 gallons).

The Franklin County Water Supply Study included an analysis of water rates for eleven community water suppliers. The Water Supply Study found that in 2001, suppliers charged by the following methods: a flat fee per year, per quarter, per connection, or per \$1,000 of real estate valuation; a fee per unit of water consumed; or, a combination of the two. The Turners Falls Water Department, Orange Water Department, and the Northfield Water District appear to have pro-rated fees per unit of water used with an increase in rates after use surpasses a threshold volume.

The Water Supply Study demonstrated that in 2001, households on public water in Franklin County paid a range of fees for their public water service. The analysis compared fee rates by employing the following assumptions for each water supplier: 1) all households served by public water had an average of 2.5 persons; 2) daily consumption per person per day was seventy-five gallons (75 gallons is equal to 10.03 cubic feet); and 3) household dwelling units had assessed valuations ranging from \$100,000 to \$150,000. Based on the stated assumptions, Orange households served by public water paid about \$200 a year while the costs of all eleven suppliers included in the analysis ranged between \$93 and \$556 annually.

Conservation Actions to Sustain Drinking Water Quality and Quantity

The Orange Water Department has taken specific steps towards conserving the quality of drinking water pumped from Wells #1, #2 and #3. Delineating Conceptual Zone II Recharge Areas is required before land uses can be properly assessed as to whether they could contribute to the contamination of the ground water, the aquifer, and the well. Water testing and adoption of Water Resource Districts are other ways in which the Town is working to protect the quality and quantity of its water supply.

DEP Approved Conceptual Zone II Delineation for Wells #1, #2 and #3

A Zone I is defined as the area completely surrounding a well the radius of which is between 100 and 400 feet depending upon the yield, which is determined by a pumping test. A Zone II is the area of an aquifer that contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at approved yield, with no recharge from precipitation). It is bounded by the groundwater divides that result from pumping the well and by the contact of the aquifer with less permeable material such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, the Zone II extends up gradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or recharge boundary). DEP defines a Zone III as a secondary recharge area, which provides surface and groundwater drainage to the Zone II.

Water Resource Districts

The Zone I and Zone II recharge areas for the three public water supply wells of the Orange Water Department have been made part of the Town's zoning bylaws and are considered Water Resource Districts. The Water Resource Districts, as described in the bylaws, provide use, density, impervious cover, and groundwater recharge regulations for the purpose of protecting the aquifer from contamination. These regulations apply standards and language similar to many other watershed and aquifer protection bylaws adopted by communities in Massachusetts. These regulations take precedence over the zoning of the underlying districts. There are two Water Resource Districts in Orange. The First Water Resource District's boundaries are those delineated by the Zone I and II recharge areas for Well #3. The boundaries of the Second Water District are those as delineated for the Zone I and II recharge areas for Wells #1 and #2.

The engineering firm, Horsley and Witten, prepared the Conceptual Zone II Delineation for the Orange Water Department's Wells #1, #2 and #3 in 1994. Wells #1 and #2 share the same delineated Zone II recharge area located in the west central portion of Orange. This Zone II is roughly bounded by the south bank of the Millers River to the north, the northern edge of Lake Mattawa to the south and Holtshire Road to the west. Railroad tracks also lie within this recharge area in the northern end. The Well #1 and #2 Zone II recharge areas are currently zoned Residential.

Well #3's delineated Zone II recharge area is located in the southeastern most corner of Orange with approximately 25 percent of the recharge area extending into the Town of New Salem. The Zone II is roughly bounded by Shingle Swamp Brook to the north, Orange

Municipal Airport and Cold Brook to the east and Route 122 to the west. Well #3's Zone II extends south well into the Town of New Salem. Routes 122 and 202 are located within the Zone II recharge area of the well. The area within the Zone II is currently zoned Residential/Commercial and the northwest section is zoned Village Residential (*please see Community Facilities and Services Map where the boundaries of the recharge areas are identified*).

Water Quality Testing

The most current water quality testing information, the 2003 Consumer Confidence Report, was prepared by the Orange Water Department and is described in Issue 13 of "Orange Water Works," a newsletter from the department sent to all water customers in the spring of 2004. The 2003 data shows that the department had zero violations and that they did not exceed any of their Maximum Containment Levels or MCLs for lead, copper, nitrates and two chemicals related to Trichloroethylene, a substance associated with industrial degreasing processes.

Other Conservation Measures

The Orange Water Department offers water conservation kits to town residents. These kits include low flow showerheads, a toilet bag which displaces water in older model toilet tanks, toilet dye tablets for leak detection purposes, reduced-flow aerators for sink faucets, a roll of Teflon tape to reduce leakage around fittings and an instruction manual.

Public Drinking Water Issues

Current vs. Potential Future Demand

In 2003, the Franklin Regional Council of Governments (FRCOG) prepared a Regional Water Supply Study for fourteen of the twenty-six communities in Franklin County. The study estimated potential future water demand for each community water supply system using population growth projections for the years 2010, 2020 and at maximum build-out (an estimate of the total number of people that could live in a community based on existing zoning and other assumptions). Registered withdrawal volumes and safe yields or approved volumes were used to gage whether the community water suppliers' existing supplies would be able to meet short and long term future water needs, respectively.

Current Capacity

When reviewing the Orange Water Department's capacity to support additional demand for water, the Water Supply Study noted that the supplier's registered withdrawal volume was 630,000 gallons and that its permitted withdrawal volume added 330,000 gallons for a total of 960,000 gallons per day. Because its average annual daily use in 2001 was 621,325 gallons, the Orange Water Department appeared to have the capacity to pump an additional 338,675 gallons per day (the point at which it would be using its total regulated volume) plus 99,999 gallons per day (the allowable overrun). This could mean that the Orange Water Department had the capacity to provide up to 438,674 more gallons per day without needing an additional permit from the State. Although this extra capacity was almost 71 percent of its

use in 2001, the Water Supply Study assumed that an incoming high water-using industry could consume that volume or a good share of it. The study concluded that Orange Water Department's supply was large enough to support additional demand at the scale of historic use with increases consistent with projected population growth rates, but that it might not be enough to support a high water using industry or business as well.

Potential Future Demand

The 2003 Franklin County Regional Water Supply Study estimates future water needs based on water use in 2001 and population projections developed by the Franklin Regional Council of Governments. The demand analysis assumes a direct correlation between population and total water use. It assumes that unaccounted water uses will not exceed 10 percent by 2010, which is a target of the Massachusetts Department of Environmental Protection (DEP).

It also assumes that the percentage of the Town's population served by public water will be the same between 2001 and 2020, though the numbers will increase as the population increases. For example, in 2001, roughly 52 percent of the Town's population was served by public water. In 2010, Orange is projected to have 8,060 residents and the Water Supply Study estimates that 4,196 of these will be on public water (which is equal to 52 percent of 8,060). The Water Supply Study projected that the same share of residents would be on public water in 2020 (4,499) (see *Table 5-2*).

Table 5-2: Orange Water Department Projected Demand

Year	Estimated No. of Residents Served	Daily Per Capita Residential Use (gallons per day)	Total Projected Daily Demand (gallons per day)	Safe Yield (gallons per day)	Surplus or Deficit (gallons per day)	Percentage of Safe Yield Potentially Available
2010	4,196	69.9	481,146	1,368,000	886,854	65%
2020	**4,499	69.9	515,898	1,368,000	852,102	62%
Maximum Build-out	38,935	69.9	3,628,297	1,368,000	-2,260,297	-165%*

Source: Franklin County Regional Drinking Water Study; 2003. *This figure refers to the need for increased supply to satisfy build-out demand as a percentage of existing safe yield. ** Please note the text in the paragraph below that describes the population projected for 2020 was grossly underestimated.

Table 5-2 shows results of the Water Supply Study including projected future daily demand assuming the amount used per person per year is consistent over time. Based on the results of the study, Orange may have enough water through the year 2020, as long as the Town does not experience the development of high-water use businesses. It is important to note that the study's assumption underestimates the total amount of water that could be used within the area served by public water in the future. All subdivisions in Orange (as of September 2004) are connected to the public water system. Increases in public water demand from new subdivisions is a realistic assumption according to Master Planning Committee members as there is developable land within the region served by public water.

The Water Supply Study also estimates that at maximum build-out, 100 percent of the population or, an estimated 39,000 people will be on public water. At maximum build-out, the Town is projected to require 2.26 million gallons of water per day beyond the capacity of its current sources.

The Town of Orange could pursue two courses of action to plan for future demand: 1) develop new sources and 2) conserve water by reducing water needs per person. The Water Supply Study identifies land areas located above estimated aquifers that are not constrained from being included within a wellhead protection area. The Massachusetts DEP regulates how new sources of drinking water are brought on-line. The only land use allowed within 400 feet of a new well is unprotected privately owned forest. Based on these assumptions, a potential water supply source might be found in the vicinity of an extensive high yield aquifer along the West Branch of the Tully River in town. Other areas of privately owned forest occur over low-to medium yield aquifers in the following locations: northeast of the intersection of Rte. 2 and Rte. 78 in West Orange, east of Well #3 just north of the town line, along Farm Brook, and in the vicinity of Packard Pond and East Branch of the Tully River.

The Orange Water Department is currently in the negotiation stages of acquiring property on the north side of the Millers River for the purpose of creating a new public water source. It is anticipated that if this effort is successful, the new source will likely have a capacity equal to that of Well #3, 485,000 gallons per day.

Aquifer, Recharge Area, and the Potential for Contamination

The Town of Orange's water supply, as discussed in the Massachusetts Department of Environmental Protection (DEP) Source Water Assessment and Protection Report (SWAP) of 2003, is derived from underground sources of water located in layers of saturated sand and bedrock called aquifers. Wells #1 and #2 are both located within the same aquifer, the North Pond Brook aquifer, which lies between Lake Mattawa and the Millers River along the North Pond Brook valley. Well #3 is located on the western edge of the Cold Brook/Shingle Swamp aquifer, located in the southeastern corner of Orange between Shingle Swamp Brook and Cold Brook. Both aquifers are considered sand and gravel unconfined aquifers, with geological characteristics that cause them to be vulnerable to contamination. An unconfined aquifer is one in which the top of the aquifer is delineated by the water table. Above the water table, in the zone of aeration, interconnected pore spaces are open to the atmosphere. Lacking a confining hydrogeologic barrier, i.e. clay, these aquifers are vulnerable to contamination migrating into the aquifer from activities on the land surface.

The North Pond Brook aquifer is an unconfined sand and gravel aquifer that is considered to be relatively narrow. According to the DEP, boring logs indicate that the sand and gravel deposits of the North Pond Brook aquifer are medium to coarse and up to eighty-five feet deep. Although some silt and clay was noted, no continuous confining layer of clay was found.

As noted by DEP, boring logs for Well #3 indicate a confining layer of clay in the immediate vicinity of the well, however, the confining layer travels out to the east and north, whereas the aquifer flows primarily east, northeast toward Lake Rohunta. The aquifer, therefore, is initially confined, but then expands to the unconfined section of the recharge area. As a result, although the aquifer is protected to some degree from land uses within the area of the

confined clay layer, it remains at risk for contamination from those activities in the unconfined portion of the recharge area. DEP also notes that the extent and degree of protection of the confining layer is not known. Of note, is the fact that low levels of volatile organic compounds (VOCs) have been found in the water from Well #3 in the past. Given the low level of concentration reported, no treatment was required at the time. In 1990, VOCs were also found in Well #1 during one sample, but none were found thereafter.

Land within the Zone I wellhead protection area and the Zone II recharge area of an underground water supply source plays a key role in determining the susceptibility of the groundwater to contamination. Currently, the three wells of the Orange Water District do not have conforming Zone I's. According to DEP, the land that is located within a Zone I wellhead protection area must be used for water supply purposes only, not as residential land, farmland, or any other use that might result in the contamination of the well.

Massachusetts's drinking water regulations require public water suppliers to own the land within the Zone I, or control uses of the land through various means including a conservation restriction or Memorandum of Understanding (DEP; 2003). Wells #1, #2, and #3 have Zone I's that are considered to be non-conforming as the Town neither owns nor controls the land surrounding the wells, which were grandfathered prior to the Zone I requirement.

Transportation corridors and farming activities are land uses within the Zone Is, which pose threats to the water supply.

The land uses within the Zone II recharge areas for the Town wells include a mixture of forest, cropland, residential and a small amount of commercial/industrial lands. DEP's Source Water Assessment (SWAP) report notes that the Zone II recharge area for Wells #1 and #2 have the following land uses that pose a potential threat to water quality:

- Agriculture – specifically fertilizer /pesticide storage or use;
- Residential – fuel storage, lawn care/gardening, septic systems;
- Other - including above ground tank storage tanks, stormwater drains/retention basins, railroad right of way, sand/gravel mining, medical facility, transportation corridor (Route 2), and electrical transformers.

The Zone II recharge area for Well #3 has the following land uses that pose a threat to its water quality:

- Agriculture – dairy farms, fertilizer & pesticide storage or use, livestock operations, and nurseries;
- Residential – fuel storage, lawn care/gardening, septic systems;
- Other – including above ground storage tanks, stormwater drains, golf course/driving range, transportation corridors (Routes 122 and 202), and electrical transformers.

According to DEP, of the land uses cited above, the use that poses the greatest threat to contamination of the water source for both Zone II recharge areas is the storage and use of fertilizers and/or pesticides. Given the degree of vulnerability of both aquifers, the DEP, in the SWAP report, classifies the susceptibility of the North Pond Brook and Cold Brook/Shingle Swamp aquifers as "high". Additionally, DEP notes that the Zone III for Wells #1 and #2 has a high degree of susceptibility to contamination from underground

storage tanks. DEP defines a Zone III as a secondary recharge area, which provides surface and groundwater drainage to the Zone II.

Water Supply Recommendations

- **With Town Meeting approval, have the Water Department purchase land within the Zone I wellhead protection areas surrounding Wells # 1, #2 and #3 to help protect the Town's community drinking water supplies from contamination.** The Zone I is the 11.5-acre circular area of land around each wellhead. Generally, it is also the area where the well is most susceptible to contamination, which is one of the reasons the State encourages communities to purchase or otherwise acquire the land within the Zone I.
- **Acknowledge that any expansion of water lines must be planned with consideration of its potential impacts on future development.** Public water and sewer can both focus and expand the location, types and density of development. It is critical for the Town to understand all of the potential environmental and fiscal impacts if, and when, planning an expansion of sanitary infrastructure.
- **Together, the Orange Board of Health and the Orange Water Department should explore the feasibility of acquiring access to potential future water supply areas via conservation restrictions.** Long term planning for the community's water needs could include a look to the future and to securing access to other high yield aquifers in Orange. The Franklin County Regional Water Supply Study (2003) identified several land areas around the West Branch of the Tully River that could potentially be available for future community drinking water supplies. The Water Supply Study found that DEP prohibits land uses within the Zone I of a wellhead that are inconsistent with water supply purposes. Taken literally, the limitations provide that privately owned unprotected forests or, Town land owned specifically for water supply purposes, are the only land uses allowed within a proposed wellhead protection area (although eminent domain may be an option if deemed necessary). Future conservation restrictions that protect open space from development can be designed so as to allow for the land's use as a future drinking water supply.
- **The Town of Orange Water Department should work with the Orange Board of Health, Millers River Environmental Center, the Millers River Basin Team, and the Franklin County Solid Waste District to develop educational outreach programs for farmers, business owners, and residents to reduce threats to groundwater within the Zone II recharge areas.** A Zone II is typically much larger than its associated Zone I and represents the land area that contributes most of the groundwater to the well (through precipitation). Agricultural, transportation, and residential uses, found within the wells' Zone II recharge areas can contribute pollutants to the groundwater and ultimately, the

drinking water supplies. Education targeted through outreach to landowners, farmers, and highway officials can provide information and support for the adoption of best management practices that conserve water supply integrity over time.

Wastewater Treatment

The Town of Orange owns and manages its own wastewater treatment facility (WWTF) located off Route 2A along the Millers River. It accepts wastewater from all the sewer areas of Orange in Zoning District A (Village Residential and Village Residential/Commercial) and also portions of Zoning District B (Residential/Commercial) including the Randall Pond Industrial Park off South Main Street. More specifically, the sewer area is bounded to the south by Mahar Regional School, west by Shelter Street, east by the end of a pipe one hundred yards east of Jones Street, and north by the end of a pipe a few hundred yards north of Logan Avenue (*the current sewer lines are shown on the Community Facilities and Services Map*).

In 1997, the Town of Orange hired Dufresne-Henry, Inc., an engineering and planning firm, to complete a Comprehensive Wastewater Management Plan (2000). This plan evaluated the existing conditions of the WWTF and the wastewater collection system as well as made recommendations for cost-effective improvements for increasing the system's efficiency over the next twenty years. The Plan was the main source of information for the following descriptions of the system's capacity, wastewater issues which existed between 1995 and 1998, and the recommendations intended to solve the most pressing problems. In addition, the Orange WWTF Chief Operator, Edward Billeil, was also a source of information concerning the progress made since 2000 in implementing the recommendations of the Wastewater Management Plan.

This section includes a description of an assessment of the wastewater treatment facility in Orange and a discussion of the potential impacts of any future sewer line expansion.

Goal and Objectives

The following goal and objectives were developed from the results of the Community Survey:

Goal

- To provide environmentally sound wastewater treatment while supporting existing and desired development patterns.

Objectives

- Address issues with the existing sewer system, including the need to upgrade some lines and to fix infiltration and inflow problems.

- Consider establishing a growth boundary for future sewer extensions consistent with the areas where the Town wishes to direct future development.
- Plan any potential future expansion of sewer infrastructure in a way that helps retain rural character and traditional village development patterns.
- Explore options for funding system improvement and upgrades.

Wastewater Treatment Facility

The Orange Wastewater Treatment Facility (WWTF) is a secondary treatment plant that uses the activated sludge process and which was put into service in March of 1977. It receives wastewater from a collection system that has been in use since the 1890s. The facility serves a population of approximately 3,500 residents in the area of Orange Center. Three full-time staff including a Chief Plant Operator are responsible for the operation and maintenance of the facility. Sewer customers pay for the service based on the amount of water they use. The sewer user fee is \$2.00 per hundred cubic feet of water. This fee is used to pay for the maintenance of the WWTF and the collection system. Table 5-3 presents statistics relevant to the service provided by the Orange WWTF.

Table 5-3: Statistics for the Orange Wastewater Treatment Facility (1995-1998)

Number Persons Served	Design Average Daily Capacity	Actual Average Daily Flow	% of Design Capacity Used	Sludge Treatment or Disposal	Effluent Disposal Location
3,500	1.10 MGD	1.04 MGD	95%	Transported to Fitchburg WWTF	Millers River

Source: Comprehensive Wastewater Management Plan for the Town of Orange, MA, Dufresne-Henry, Inc., 2000.

Note: MGD = Millions of Gallons per Day.

Influent Hydraulic Loading

Wastewater treatment plants are required by the Massachusetts Department of Environmental Protection (DEP) to initiate plans for expansion when the rate at which wastewater comes into the system, called the influent hydraulic loading rate, reaches eighty percent (80%) of the facility's design capacity for ninety (90) days. The Orange facility appears to be running at or around 95 percent of its design capacity. Mr. Edward Billeil, Chief Operator of the Orange WWTF, reported that the DEP is aware of the capacity situation and of the efforts of the WWTF staff to reduce infiltration and inflow (I & I) to help address capacity issues. Infiltration is groundwater entering the pipes through breaks and open joints and inflow is storm water entering the pipes from cracked manholes, roof drains, and other sources.

Design Criteria: Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS)

Biological oxygen demand (BOD) and total suspended solids (TSS) are two design criteria that describe wastewater, both the quality of the water coming into the system, and the water being discharged to the rivers. Biological oxygen demand (BOD) is a measure of the amount of oxygen consumed by the wastewater in a given period, typically five (5) days. Total suspended solids (TSS) measure the number of particles in the water. The United States Environmental Protection Agency and the Massachusetts DEP regulate the levels of these parameters found in the water discharged from wastewater treatment plants. Each plant has a National Pollution Discharge Elimination System (NPDES) permit that quantifies the allowable levels of BOD and TSS in the discharged wastewater. The actual BOD and TSS averages for effluent is significantly below the permit limits. It appears that on the average, the facility is providing environmentally sound wastewater treatment in compliance with its NPDES permits.

Table 5-4: A Comparison between National Pollution Discharge Elimination System (NPDES) Permit Limitations and Actual Rates for Effluent BOD and TSS (1995-1998)

NPDES BOD Design Average Limit	BOD Average Actual	NPDES TSS Design Average Limit	TSS Average Actual
275 lbs/day	61.7 lbs/day	275 lbs/day	30.4 lbs/day

Source: *Comprehensive Wastewater Management Plan for the Town of Orange, MA, Dufresne-Henry, Inc., 2000; Massachusetts Department of Environmental Protection, 2004.*

Note. BOD = Biological Oxygen Demand. TSS = Total Suspended Solids.

The Wastewater Treatment Process Explained

The Orange WWTF uses an activated sludge process to treat the flow of wastewater. The preliminary treatment process consists of a manual bar screen and a grit removal process. The bar screen filters out large objects. The screen is manually raked to remove the debris, a process that is labor intensive. The screened influent then flows into two wet wells where it is pumped into grit chambers for grit removal. From this point, the wastewater flows by gravity through all subsequent systems. After the water leaves the grit chambers it flows to the aeration basins where it is mixed with return activated sludge from the final clarifiers and then aerated. The contents of the aeration basins are referred to as mixed liquor. The mixed liquor remains in the aeration basins for a time sufficient for the biological reactions to occur. The mixed liquor then flows to the final clarifiers where suspended solids are separated from treated wastewater by gravity. After leaving the clarifiers, the treated water passes through a twelve-inch Parshall Flume, a device that measures the total quantity of treated wastewater. Hypochlorite is pumped to the head of the Parshall Flume to disinfect the water. The wastewater is then held in two chlorine contact basins for greater than fifteen minutes. From here, the treated effluent is discharged into the Millers River. The solids, which have settled in the final clarifiers, are either returned to the aeration basins or wasted to the diffused air flotation thickener.

The wastewater treatment plant's original sludge handling system consisted of a flotation thickener, two sludge holding tanks and one vacuum filter. The dewatered sludge cake was then deposited in the local landfill. Currently, only the flotation thickener and the storage tanks are being used, as the vacuum filter was taken off line in 1996. A private company currently takes the liquid sludge to the City of Fitchburg Wastewater Treatment Facility, where it is dewatered and incinerated.

The Orange Wastewater Treatment Facility also has a septage receiving station, which is not in use. Septage is the term for the material that commercial haulers of septic system effluent pump out of on-site systems and dispose of via wastewater treatment facility receiving stations. The Orange septage handling facility consists of a 5,000 gallon holding tank equipped with a receiving manhole and strainer basket, and a pneumatic ejector which discharges septage to the wastewater influent channel at a rate of 50 gallons per minute. Currently, septage is hauled to other area treatment plants.

Town of Orange Comprehensive Wastewater Management Plan

The Town of Orange initiated a study of its wastewater treatment facility and wastewater collection system in 1997. Dufresne-Henry, Inc., an engineering and planning firm, was hired to complete a Comprehensive Wastewater Management Plan to evaluate the existing conditions of the WWTP and the wastewater collection system as well as make recommendations for cost-effective improvements to increase system efficiency over the next twenty years. The Plan also estimated areas that could be serviced by Town sewer in the future as well as the potential impacts and costs of sewer extensions. Recommendations for the wastewater treatment process were made and prioritized. The top-priority recommendations were to:

- Implement an inflow and infiltration program;
- Replace influent pumps and control system;
- Correct the hydraulic problems within the aeration basin, install new return activated sludge pumps and controls, and install a new fine bubble system; and,
- Redesign and relocate the hypochlorite feed system within the chlorination system.

Several of the top priority recommendations were implemented in 2000, prior to the completion of the management plan. They include replacing the influent pumps/controls and upgrading the return activated sludge pumps/controls, as well as adding a new fine bubble aeration system. These improvements resulted in an increase in the capacity of the wastewater treatment plant but the actual design capacity increase has not yet been officially determined, according to the Chief Operator. Additionally, new flow meters and variable frequency drives were also installed.

Wastewater Collection System

The Town of Orange's wastewater collection system was constructed in the 1890s. The Town owns and operates approximately 101,000 linear feet or 19.13 miles of gravity sewer, consisting mainly of vitrified clay pipe with mortar joints. It is primarily a separated system, that is, sewage is collected in a sanitary sewer line separately from storm run-off, which is collected in a storm sewer. The system did, however, have a number of cross-connections between sanitary sewers and the storm drainage system. Many of these cross-connections were eliminated as a result of a rehabilitation project in 1983. The rehabilitation project also eliminated a number of sources of infiltration and inflow (I & I) by repairing or replacing sections of the collection system.

Current Infiltration and Inflow Problems and Potential Solutions

Infiltration and inflow (I & I) continues to be a concern. From 1997 to 1999, as part of the study conducted by Dufresne-Henry, Inc., the collection system was evaluated for I & I. The engineering firm determined that of all the water that flowed into the WWTF during the 1995-1998 period:

- 20 percent came from domestic and commercial and industrial uses;
- 20 percent came from stormwater flowing into the sewer system via legal and illegal connections (sump pumps, yard drains, rain gutters, etc.); and,
- 60 percent came from groundwater that leaked into underground pipes through cracks and eroded fittings.

The evaluation determined that to reduce Infiltration and Inflow the following tasks would need to be carried out:

Inflow

- Reroute those roof, yard and eave drains, catch basins, and culverts that are incorrectly connected to the sewer collection system, to the storm sewer system eliminating up to 54 percent of the total inflow to the system.
- Reroute those flat roofs with drains tied to the sanitary sewer system, to the storm sewer system, eliminating up to 31 percent of inflow.

Infiltration

- Repair sewer manholes and failed sections of sewer, removing approximately 53 percent of infiltration.

To date, only some of the failed sections of sewer have been repaired. Streets that have been worked on to resolve infiltration and inflow problems are all located on the north side of Orange and include:

- Bacon Street;
- Mechanic Street;
- Winter Street;
- Howe Street;
- Summer Street;

- Parts of Grove Street;
- Ball Street; and,
- Kelton Street.

In 2004, Whitney Street, Battle Street, Shelter Street, and West Russ Street water mains and hydrants were replaced including water service lines. Over the next three years, Prospect, North Prospect, Summit and High Streets will be in their design phase for water system improvements. Mr. Billeil, the Chief Operator of the Orange WWTF, suggests that many of the streets that have had their sewer sections refurbished did not have huge problems. There are other sections of the collection system that are worse, however, those that have been repaired are located in low-income neighborhoods and therefore, qualified for federal grant money through the Community Development Block Grant program.

Potential for Future Sewer Line Extensions to Problem Areas

The Comprehensive Wastewater Management Plan looked at the feasibility of extending the current wastewater collection system to areas in town experiencing problems with their current on-site septic systems. According to the study, a significant portion of the Town's land area and a little more than half of the Orange residences are not serviced by the wastewater system. These residences rely on private septic systems. A number of these residential systems, as well as some commercial systems, have had system failures for reasons including poor soil conditions, high groundwater, and inadequate system construction. To alleviate the potential for groundwater pollution due to these conditions, potential extensions of the current municipal wastewater collection system were considered by Dufresne-Henry, Inc.

Dufresne-Henry identified potential areas for expanding the collection system based upon problem areas within existing development and areas with potential for future development. Areas of future development were determined to include the Randall Pond Industrial Park off South Main Street, which has subsequently been constructed, and industrial growth adjacent to the Orange Municipal Airport off Daniel Shays Highway. Areas of existing development that could be in need of service were determined to include the following:

- **Lake Mattawa, Tully Pond and Packard Pond areas due to their proximity to surface water.** The Lake Mattawa area is of concern as many of the developed lots surrounding the lake have homes constructed in the 1970s, with septic systems designed solely for summer use. Many of these homes are now in year-round use and the systems were not designed to accommodate such full-time use. Additionally, failures have occurred due to unsuitable soil conditions for on-site septic systems, i.e., high permeability and the presence of bedrock or other impervious materials close to the surface. Also of significance is the fact that many of the Lake Mattawa properties are within the Watershed Protection Act Primary Protection Zone and are not in compliance with the State Environmental Code, Title 5. The Tully Pond and Packard Pond areas have also experienced septic system failures, again due to unsuitable soils;

- **East Road area.** Systems have been failing primarily due to insufficient systems consisting of metal tanks with associated leach pits;
- **Holtshire Road and West Orange areas.** Systems have been failing due to unsuitable soil conditions;
- **East River Street mobile home park.** The park has a pumping system to connect to the current municipal collection system, but still has a number of lots with on-site systems, some of which have failed;
- **Oaklawn Avenue development.** Problems are due to high groundwater and poor soil conditions;
- **New Athol Road.** Areas have groundwater;
- **Wheeler Road.** Areas have groundwater; and,
- **East Main Street.** This area was the site of a new sewer force main in 1997-1998 that connected the Brookside Road area to the sewer collection system. East Main Street is characterized by high groundwater and sandy soils. Several septic system failures have also occurred in this area.

Potential Future Alternative Improvements

The study identified potential alternative improvements for the areas, which included replacement with on-site disposal systems meeting the requirements of the State Environmental Code, Title 5; conventional gravity sewers; small diameter sewers; pressure sewers; and vacuum sewers. These alternative improvements were compared to determine the best technology for each area using the following criteria for each: history of performance; operation and maintenance requirements and their complexity; cost analysis; and feasibility and applicability. Each alternative improvement was assigned a numerical rating for each of the evaluation criteria. Based on this analysis, the following recommendations were made:

- The Town could use an extension of the sewer system to South Main Street, East River Street, Daniel Shays Highway, and Lake Mattawa with the use of pressurized collection systems;
- The Town could use an extension of the sewer system to Wheeler Road and Oaklawn Avenue with the use of gravity collection systems;
- The Town could use an extension of the sewer system to New Athol Road with a combination of pressure and gravity systems; and,
- East Road, West Orange, Tully Pond, Packard Pond and Holtshire Road residents should have their on-site septic systems evaluated and develop plans for improvement.

Potential Impact of a Future Sewer Line Extension to Resolve Problem Areas

The potential impact of any sewer line extension on the Orange Wastewater Treatment Facility (WWTF) was also considered in the study. The WWTF is over twenty years old and currently in need of an upgrade. To plan for and recommend improvements to the WWTF over a twenty-year planning period (to 2018), Dufresne-Henry, Inc. assessed the future conditions of the existing wastewater treatment system. They took into consideration the age of the treatment facility, needed repairs and renovations, land use patterns, population projections, and wastewater flow and loading projections.

Table 5-5: Flow Rate Comparison of Current Design, Actual Present, and Projected Future Flows (million gallons per day (MGD))

	Current Design *	Present Actual	Projected Future (to 2018)
Average Daily Flow	1.10 MGD	1.04 MGD	1.35 MGD
Maximum Month Flow	Not available	1.74 MGD	2.26 MGD
Maximum Day Flow	2.30 MGD	3.46 MGD	4.55 MGD
Peak Hour Flow	3.38 MGD	4.60 MGD	5.90 MGD

Source: *Comprehensive Wastewater Management Plan for the Town of Orange, MA, Dufresne-Henry, Inc., 2000.*

* This current design limit was achieved after upgrades were made to the system in 2000. The original design limit was 1.10 MGD.

According to the analysis done by Dufresne-Henry, Inc., the Town's population density is expected to remain constant through 2018 with neither residential nor commercial development increasing significantly. Also, based upon their analysis of US Census data, projections of the Massachusetts Institute of Social and Economic Research (MISER) and population information provided by the Town of Orange, Dufresne-Henry projected the Town's population will increase by 0.66 percent per year over a twenty year period (1998-2018) for a total projected population of 8,800 for the year 2018. Recent development trends including new subdivisions may point to a higher actual population growth rate than Dufresne-Henry estimated.

As part of the wastewater management study, Dufresne-Henry compared the current design capacity to actual flows and projected future flows as noted in Table 5-5. Although the projected future flow is significantly higher than the current design capacity, it is noted that the current design rates have already been exceeded in the areas of maximum day flow and peak hour flow. It is anticipated that improvements to the collection system will be made to reduce inflow and infiltration into the system, thus decreasing the flow somewhat. However, these improvements would not sufficiently reduce the peaks in wastewater flow rates following storms.

In addition to the future flow rates, the ability of the Orange Wastewater Treatment Facility to accept septage (pumped residue from on-site septic systems) from residential septic systems in the future also needed to be taken into account. To this end, the additional biological oxygen demand (BOD) and total suspended solids (TSS) loads were reviewed to

determine their impact on the operation of the WWTF. As the WWTF currently does not accept septage, Dufresne-Henry projected the future quantity of septage based on 1,500 households with 1,500-gallon septic tanks pumped every three years. They also included fifteen emergency pumpings per year. The septage quantities and characteristics were then combined with the quantities for the collection system including that of the proposed sewer extensions. Table 5-6 lists the current design and projected future influent loading conditions.

Table 5-6: Comparison of Current Design, Actual and Potential Future Influent Loading Rates due to Sewer Line Extensions

	Biological Oxygen Demand (lb/day)			Total Suspended Solids (lb/day)		
	Design	Present Actual Loadings	Projected (to 2018) Future Loadings	Design	Present Actual Loadings	Projected (to 2018) Future Loadings
Average Day	900	533	1,098	970	535	1,317
Maximum Month		997	1,997		849	2,086
Maximum Day		1,066	2,116		1,821	3,750

Source: *Comprehensive Wastewater Management Plan for the Town of Orange, MA, Dufresne-Henry, Inc., 2000.*

Thus, in order for the WWTF to effectively treat future flows that include potential future sewer line extensions, Dufresne-Henry, Inc. concluded it would be necessary for the capacity of the facility to be increased to accommodate the projected future demand.

Wastewater Issues

Orange has some important issues to consider in regards to wastewater treatment.

The Need for Cost-Effective Improvements to Sewer Capacity to Support Economic Development

One of the greatest needs expressed by the respondents of the Orange Community Survey (2002) was for more employment in town. Economic development and job creation can depend on many factors including properly zoned and accessible land, an appropriately trained and available labor force, a high quality of life for residents, transportation resources, and infrastructure. Infrastructure can include telecommunications capacity, water supplies, and wastewater treatment facilities. Some types of industries require access to public sewer service for disposal of process wastewater for example. If the Orange WWTF is constrained from treating the wastewater of a potential new industry or of an expanding existing business, it could mean lost future revenue for the Town and lost job opportunities for residents.

The Town of Orange sought to assess the needs for expanding sewer lines via the Comprehensive Wastewater Management Plan, and the current performance of the WWTF. It was determined that the WWTF was operating at 95 percent of its design capacity in regards to handling the flow of wastewater entering the facility and that most of this was groundwater leaking into old pipes and storm water entering the system through private

gutter leads and sump pumps. Only about 20 percent of the water treated by the WWTF was actually sanitary wastewater, generated by sewer customers.

Sewer system capacity improvements need to be generated in a cost effective manner. To increase capacity, there appear to be several choices to combine or pick from: 1) Reduce water consumption; 2) Redirect private sump pumps and roof drains out of the wastewater collection system; 3) Rehabilitate sections of the collection system to reduce infiltration problems; and, 4) Rehabilitate the WWTF with more aeration basins, more clarifiers, and more chlorine basins.

- 1) Reducing water consumption to increase WWTF capacity. According to the Wastewater Comprehensive Management Plan, the estimated sewage base flow between 1995 and 1997 was 0.27 MGD from 1,200 connections in 1997. The Franklin County Regional Water Supply Study (2003) estimated that the amount of water used by residential, commercial, and industrial uses could be reduced through moderate conservation practices (i.e., reducing water consumption from 70 to 49 gallons per capita per day and reducing commercial, industrial, and institutional use by 35 percent by 2020). The resulting reduction in water usage is estimated to be approximately 0.16 MGD by 2020. Some part of the reduction in water demand is expected to be the result of the substitution of pre-1994 fixtures with water saving devices. Businesses and industries would save money in the process, which might be incentive enough to warrant voluntary adoption of conservation technologies at little or low cost to Orange. If the Town were to award each sewer customer an average of \$500 to upgrade existing appliances with low-flow fixtures, it could cost the Town an estimated \$3.75 for every gallon of increased capacity at the wastewater treatment plant.
- 2) Redirecting private sump pumps and roof drains. This could reduce total inflow by 85 percent and could cost \$430,000 and possibly some small component of the 1.3 million dollar estimate for collection system rehabilitation. Because inflow represents an estimated 20 percent of daily flow into the system, an 85 percent reduction could mean a 17 percent reduction in daily flow or, 0.18 million gallons per day. Even if the Town of Orange were to pay for this work, it would cost a relatively low, \$2.38 for every gallon of increased capacity.
- 3) Rehabilitating sections of the collection system and manholes to reduce infiltration. This could cost 1.3 million dollars and reduce total infiltration by 53 percent. Because infiltration represents an estimated 60 percent of total flow, this could mean a reduction in total flow of 32 percent or 0.33 million gallons per day. This could cost roughly \$3.94 for every gallon of increased capacity.
- 4) Rehabilitating the WWTF with new equipment. This could cost between 1.0 and 1.8 million dollars (Dufresne-Henry; 2000). Expanding the size and capacity by adding basins could cost an additional 2.6 million dollars. Expanding the facility would allow for an increase in average daily flow from the current 1.04 million gallons per day to 1.35 million gallons per day, or an increase in capacity of 0.31

million gallons per day. Therefore, making necessary changes and increasing the capacity could cost between 3.6 and 4.4 million dollars. Rehabilitating the WWTF could cost between \$11.61 and \$14.19 for every gallon of increased capacity.

Wastewater Treatment Recommendations

- **Prior to planning any future sewer line expansion, the Town of Orange should implement aspects of the Recommended Plan for Wastewater Infrastructure Improvements, which is part of the Comprehensive Wastewater Management Plan (2000) by:** adopting water conservation measures to reduce water consumption; reducing flow into the wastewater collection system from private sump pumps and roof drains by educating residents and business owners about this problem and introducing fines if necessary to reduce it; and, rehabilitating sections of the collection system.
- **Continue to address the infiltration and inflow (I&I) problem, as reduced flow will extend the life of the WWTF.** If the flow continues to be high (which is due to I&I), then the US EPA and the State DEP will require the Town of Orange to upgrade the WWTF. Repairing the I&I problem will cost less than upgrading the WWTF. Furthermore, the EPA and State DEP, in addition to requiring Orange to upgrade the WWTF, will also require the Town to reduce the I&I problem. With an upgraded facility and a repaired collection system, the WWTF will then have a large amount of excess capacity, which means a higher cost per unit of treatment. Also, the Town would be paying for both to be done, when one (I&I) alone could fix the current capacity issue.
- **Assess and protect against the potential direct and indirect negative impacts of any planned expansion of the public sewer collection system.**

Recreational Resources

Recreational resources are an important consideration in any Master Plan. Often a town's sense of community spirit relates to experiences of neighbors interacting with each other during leisure time. The experience of community can be enhanced through activities, events, resources, and programming that seek to bring people together throughout the year. Diverse recreational opportunities serve a community in many ways.

The following section of the Community Facilities and Services chapter of the Orange Master Plan includes goals and objectives, inventories of Orange's recreational facilities and programs, recreational issues, and recommendations.

Goal and Objectives

Goal

- To provide additional recreational opportunities, programs, and facilities for all Orange residents (particularly youth) for environmental education, sports, and the arts while seeking funding from a variety of sources including private foundations and donations.

Objectives

- Identify key parcels of land in Orange Center and around village residential areas to purchase for future development as parks, play areas, and sports fields.
- Develop new neighborhood-based recreation areas and facilities.
- Address maintenance, safety, and operations issues for all existing recreational sites.
- Increase publicity and promotion for current recreational programs and activities.
- Establish new multi-use recreational trails connecting Orange's open space, natural, historic, and cultural resources to its residential areas.
- Support the Millers River Greenway trail, and enhance recreational access to the Millers River via Riverside Park.
- Improve public access for all residents, including those with disabilities, to Town-owned space and recreational areas.
- Encourage the development of arts and entertainment-oriented businesses such as movie theaters and live theater in the downtown.

Recreational Facilities

Town-owned parks and fields are regularly used for youth recreational programs and community events. Table 5-7 identifies the facilities, common activities, ownership, size, extent of resources, and issues and opportunities associated with each area or facility. These facilities and areas are labeled on the Community Facilities and Services Map.

Table 5-7: Recreational Resources and Facilities in Orange

Map #	Name of Area or Facility	Main Recreational Value or Use	Owner of Land/ Manager	Size of Area	Extent of Resources
1	Goddard Park	A community park for outdoor functions/ meetings.	Town of Orange (Town)	1 acre	Open field with no official parking.
2	Bicentennial Park (aka Kiwannis Park)	A community woodland park for outdoor functions/ meetings; adjacent to Henry Woods Conservation Land.	Town	45 acres	Offers a pavilion with picnic tables, grill, electricity, parking, and restrooms. Access to Henry Woods Conservation Land hiking trails.
3	Memorial Park	War Memorial site used for community events, memorial events, and vigils.	Town	1 acre	Parcel of land with Peace Statue, parking and electricity. Water available upon request. Bus stop at the site.
4	Spear Field	Softball.	Town	1 acre	One softball field with a few bleachers/benches and no parking.
5	Butterfield Park	Baseball, tennis, basketball, playground, bandstand.	Town	11 acres	One full size baseball diamond with dug-out, bleachers, and limited parking; 3 half size practice diamonds; 3 tennis courts; 1 basketball court; 1 playground with parking; and, restrooms.
6	Muzzey Field	Little League Field.	Owned by Town & maintained by Little League	1 acre	An official size Little League Field with batting cage, pitching machine, bleachers, announcer's booth, concession stand, restrooms and parking.
7	Facilities at Fisher Hill Elementary School	Court sports; a cafeteria used for activities such as cheerleading practice, 4H meetings and Pop Warner practice; playground activities; and soccer.	Town	1 acre	One gymnasium; a cafeteria (all-purpose room); 1 soccer field, and 1 playground.
8	Facilities at Dexter Street Elementary School	Baseball and playground activities.	Town	2 acres	One baseball diamond; 1 playground; and an all-purpose room.
9	Facilities at Butterfield Elementary School	Court sports; indoor activities; and a play area.	Town	2 acres	One gymnasium with basketball court, a cafeteria, auditorium and, an outdoor paved play area.

Map #	Name of Area or Facility	Main Recreational Value or Use	Owner of Land/ Manager	Size of Area	Extent of Resources
10	Facilities at Ralph C. Mahar Regional School	Football; track; softball; baseball; field hockey; soccer; and basketball.	Ralph C. Mahar Regional School District	117 acres	One football field; 1 outdoor track; 2 softball fields; 1 baseball diamond; 1 field hockey field; 2 soccer fields; and, 2 gymnasiums. Another new field for field hockey will be added as part of the current renovations.
11	Millers River	Boating and fishing.	Town	NA	Two boat ramps on East River Street allow access to the Millers River.
12	Lake Rohunta	Boating and wildlife viewing.	Mass. Dept. of Fish and Game (DFG)	NA	Two boat ramps.
13	Orange State Forest	Hunting and hiking.	Dept. of Conservation and Recreation (DCR)	610 acres	State Forest trails.
14	Warwick State Forest	Hunting and hiking	DCR	134 acres	State Forest Tully Trail
15	Lake Mattawa	Swimming; fishing; canoeing; sailing; and motorboating (10 horsepower).	Town	NA	Beach; boat access at the northern end of the lake; handicapped accessible fishing site; and, lifeguards available dependent funding. Red Cross offers swimming lessons available to all.
16	Orange Skate Park	Skateboarding.	Town	<1/2 acre	Equipment associated with a skate park such as pipes, ramps, rails, etc. Currently closed (2004).
17	Armory	Senior Center with associated activities such as senior club, card playing, bingo, health screenings, and meals.	Owned by Town & maintained by the Armory Commission.	NA	Houses the Senior Center, teen skating and dances.
18	Tully Mountain Wildlife Management Area	Trail Use.	DFG	348 acres	Wildlife Management Area with access to the 18-mile Tully Trail.
19	Orange Wildlife Management Area	Canoeing and wildlife viewing.	DFG	277 acres	Wildlife Management Area.
20	Conservation Land off Oxbow Road	Woodland.	Town Conservation Commission (CC)	57 acres	Open Space.
21	Warwick Wildlife Management Area	Hunting and hiking.	DFG	59 acres	Wildlife Management Area.

Map #	Name of Area or Facility	Main Recreational Value or Use	Owner of Land/ Manager	Size of Area	Extent of Resources
22	Conservation Land south of Goddard Park	Horseback riding and hiking.	Town CC	19 acres	Trails.
23	Henry Wood Tree Farm Conservation Land	Hiking.	Town CC	50 acres	Open space with trails and tree farm.
24	Conservation Land near Athol line off Route 2A	Open space.	Town CC	1 acre	Open space.
25	Conservation Land north of Black Gum Swamp	Woodland.	Town CC	80 acres	Open space.
26	Fairman Road Conservation Land	Wetland.	Town CC	3 acres	Open space.
27	Tully Mountain	Hiking.	Mt. Grace Land Conservation Trust	35 acres	Tully Loop Trail.
28	Hosmer Woods	Tree farm.	New England Forestry Foundation (NEFF)	205 acres	Tree farm.
29	Webb Forest	Tree farm.	NEFF	35 acres	Tree farm.
30	Bailey Dorrance Memorial Forest	Tree farm.	NEFF	51 acres	Tree farm with pond.
31	Fitz Family Memorial Forest	Tree farm.	NEFF	75 acres	Hiking trail.
32	Audubon Land	Massachusetts Audubon Society land as part of Whetstone Woods Wildlife Sanctuary (Wendell)	Mass. Audubon Society	190 acres	Open Space.
33	Town Hall Auditorium	Movies, concerts, dances, and the site for youth and adult karate.	Town of Orange	NA	Large auditorium space with a stage and flexible seating.
34	Orange Municipal Airport	Field sports activities and parachuting.	Town of Orange		Large recreational field and private businesses that provide customers access to sky diving activities.
35	Wheeler Memorial & Moore-Leland Libraries	Book circulation and video DVD / CD, audio tapes and audio CDs.	Town of Orange	NA	In 2005, both libraries circulated 45,554 items and had 29,020 visitors.

Map #	Name of Area or Facility	Main Recreational Value or Use	Owner of Land/Manager	Size of Area	Extent of Resources
36	Tully Trail	Hiking	NA	18 miles	An 18-mile loop trail that connects publicly and privately owned protected forestland in Orange with similar conservation lands in Warwick and Royalston.

Sources: *Orange Highway Superintendent, 2004; Town of Orange Open Space and Recreation Plan, 2001; Town of Orange, Office of the Superintendent of Schools, 2004; Office of the Principal, Ralph C. Mahar Regional School, 2004; Massachusetts Audubon Society, 2004.*
 NA = Not applicable.

Recreational Programs

Orange Recreation Association

Recreational programming for young people, of kindergarten to eighth grade ages, and for adults is provided by the fourteen-member, volunteer-run, Orange Recreation Association (ORA). The Association's programs, which are funded in part through the United Way of Franklin County, include organized sports and fitness activities each season (see Table 5-8) as well as the summer programs, "Swim and Gym" and "Fit and Fun."

Table 5-8: Orange Recreation Association's Programs (2004)

Program	Group Served	Facility Used
Basketball Camp	Youths grade 3 rd - 8 th	Butterfield School
Karate	Youths (age 4+) and Adults	Orange Town Hall
Tennis	Youths grades 1 st - 6 th	Orange Town Park Tennis Courts
Swim and Gym	Youths grades 1 - 6 th	Athol YMCA
Fit and Fun	Youths grades 1 - 6 th	Orange Town Park/Bandstand
Lacrosse	Youths grades 6 th - 8 th	Fisher Hill School

Sources: *Orange Town Clerk, 2004. The Recorder, April 21, 2004 issue.*

As of 2004, the two traditional recreation programs sponsored by the Swim and Gym (45 minutes of lessons in each) are offered at the Athol YMCA for one week each summer for youth that have finished grades 1 through 6. The other ORA program is Fit and Fun, which is open to children from grades 1 through 6. This one-week program is located at the Orange Town Park and Bandstand. Currently, both programs have a participation fee. The Swim and Gym costs \$6 per child and the Fit and Fun costs \$20 for the first child with a lesser cost for each additional child. In 2003, there were 400 participants in these various sports and programs.

Council on Aging

The Council on Aging hosts recreational activities for the elderly at the Orange Senior Center located at the Armory in downtown Orange. There is Senior Citizen Club held once weekly, a gathering of Wist players twice weekly, a bingo game held on the third Thursday of each month, and occasional entertainment as funding allows. Meals are also offered by reservation at lunchtime, Mondays through Fridays. Hearing and foot screening clinics as well as income tax preparation are also offered.

Community Events

The Orange Revitalization Partnership organizes Starry Starry Night, a New Year's Eve event for the entire family. Located in the downtown Orange, the event is free and offers events such as storytellers, jugglers and magicians. Other events include entertainers, ice sculpture, hayrides, and a bonfire. The evening concludes with a puppet parade and fireworks.

The Orange Business Association (OBA) organizes the Harvest Weekend, a one-day event on the Sunday of Columbus Day Weekend. The event, held in Butterfield Park, offers a car show, crafts and a parade. Brown Bag Lunches, also sponsored by the Orange Business Association, are held at Butterfield Park beginning in July and running for six consecutive weeks. The community can enjoy their lunch at the weekly event, which offers music in the park on Fridays from noon to 1 pm.

The recently formed Town Hall Entertainment Committee has begun to organize and offer monthly performances at the Orange Town Hall auditorium including movies. Entertainers of local and regional prominence are being scheduled to perform. Additionally, the 1794 Meeting House of New Salem will be using the Town Hall auditorium for larger concerts that are unable to be accommodated at their site.

The Athol to Orange River Rat Race, a popular canoeing event, is held on the second weekend in April on the Millers River. Conducted by the Athol Lions Club and sponsored by area businesses, the two-day event holds an amateur race on Saturday and a variety of pro-am races on Sunday. The canoe races start on the east bank of the Millers River upstream of the Main Street Bridge in Athol and finishes 100 yards upstream of the South Main Street Bridge in Orange. The kayak race, a round trip event, begins and ends near the future Riverfront Park on East River Street in Orange.

The North Quabbin Garlic and Arts Festival is held at Forster's Farm in Orange in September. This annual event is organized by volunteers and is sponsored in part by the Town of Orange and eight surrounding towns, as well as the Massachusetts Cultural Council, the New England Forestry Foundation, and Community Involved in Sustaining Agriculture (CISA). The festival showcases the many varieties of garlic and offers samplings of foods crafted with garlic as well as workshops on the history and growing of garlic. Local artists, craftspeople, and farmers have the opportunity to show their wares, and live music with a

solar powered stage entertains the crowd. Garlic themed games are a hit and include the garlic and egg toss and the infamous raw garlic eating contest.

Orange Public Library

The Orange public library, consisting of the Wheeler Memorial Library and the Moore-Leland branch, provides valuable community services despite longstanding issues involving limitations of the buildings themselves. The Orange public library spends more money to provide access to a greater number of resources per capita than other public library systems of comparable towns. However, until recently the average circulation and visitation has been less than expected given the level of investment. Over the past twelve months, the numbers of visitors and items circulated increased significantly due to library staff having implemented new programming through funds gained from a LSTA Customer Service Grant.

The Orange public library staff and others created a Library Development Plan, which addresses issues including:

- Making the Wheeler Memorial Library accessible to persons with physical disabilities.
- Increasing the capacity of the library to serve residents' lifelong learning needs.
- Developing creative ways to increase reading amongst Orange young people.
- Creating opportunities for the library to serve residents' needs for accessing materials and programs that meet current interests.
- Maintaining the library as a place for people to reconnect with other members of the community.

Recreational Resource Issues

Access to the Millers River

Currently public access to the Millers River is limited to two boat ramps on East River Street in Orange Center. However, the Town of Orange has recently been awarded a \$50,000 grant from the Massachusetts Community Development Block Grant Program's Ready Resource Fund for design plans for a Riverfront Park. The proposed Park, a former brownfields site, is located in the center of town on 0.72 acres of Town-owned property offering 265 feet of frontage on the Millers River. The design requirements will include a boat ramp, and a rental facility for boats and bicycles. After the design work is completed, the Town will then need to look for construction funds. It is anticipated the Park could be either owned and operated by the Town or leased to a recreational/tourism business. It is expected that the Riverside Park would be a job-generator. For example, owners of Zoar Outdoor, a recreational boating business with facilities in Charlemont on the Deerfield River, have expressed interest in the commercial opportunities of the Riverside Park and in opening a boat and canoe rental facility at the park. In a letter supporting the Town's application to the Massachusetts Department of Housing and Community Development Ready Resource program, the owners

of Zoar outdoor estimated that downstream of the park beyond the dam, a “white water park” could be developed for activities during the Spring and Summer months. This park could use well-placed boulders to create water features attractive to whitewater enthusiasts. Zoar Outdoor leaders see such a facility as being a significant destination point in downtown Orange.

For many years, river activists in Athol and Orange have sought to create a Millers River Greenway trail or bikeway along the banks of the river. Millers River Greenway, Inc. (MRG), active for over ten years, is a non-profit that meets regularly at the Millers River Environmental Center (MREC) in Athol. Recently, the MRG received the results of two studies that assessed potential engineering hurdles and environmental impacts of their proposed bikeway, which would run along the Millers River connecting Orange and Athol. The study was funded through a grant from the Intermodal Surface Transportation Efficiency Act (ISTEA) Program. MRG is now looking at designing a blueway, which is a river-based recreational trail that could be used by anglers and casual boaters. Their plans include upgrading or creating four river access areas along the Millers River between Athol and Orange: 1) a put-in near MREC that provides access to the river on both the east and west banks of the Millers; 2) a parking area and lavatory at the end of a public road off Rte. 202, just south of the McDonalds; 3) the proposed access at the Riverfront Park in Orange; and, 4) upgrading the East River Street river access point to include a place to lock up bicycles and canoes and a new kiosk.

Need for More Recreational /Empowerment Opportunities for Young People of All Ages but Especially Teenagers

According to the Community Survey respondents, the four most serious issues facing Orange, in order of priority, are: jobs, downtown revitalization, the local economy, and crime and vandalism. In addition, survey respondents communicated their feelings concerning the demise of the downtown, the presence of teenagers hanging around, and the lack of a teen center and of teen recreational programming, etc. Participants in the Orange Visioning Forum held in July 2003 expressed the same concerns.

All of these priority issues are interconnected. Revitalizing the downtown requires both business development and amenities like signs, trees, paving, and sidewalks. However, unless Orange engages its young residents in opportunities other than what they might experience on the street, a renovated new downtown may not realize its full economic and cultural potential.

It should be as no surprise that the proponents for the Riverfront Park include residents who think that by developing a new recreational-based park the Town may inspire re-investment in the downtown. The Riverfront Park could attract thousands of people and dollars from across the region and the state every year. That level of activity could help support new businesses in town, which could employ local teens that have the necessary skills and responsibility.

Recreational activities and programs can help to provide young people with skills and opportunities for learning. They also provide for adult oversight and opportunities for character building. In short, by investing in a more comprehensive recreation program, the Town of Orange would be re-investing in itself by providing more opportunities for young people to realize their full potential. The other issues identified below, if resolved, would help to provide opportunities for young people to recreate and take better advantage of existing facilities and resources.

Orange Skate Park

The Skate Park, currently closed, used to be staffed completely by volunteers that were coordinated by the Parks Director and the Highway Superintendent. Community Survey respondents reported that the lack of consistent hours of operation was a main concern.

Another related issue is the need for adult oversight and management in all recreational programs. Although the Orange Recreation Association provides programs for young people up to the 8th grade, it does not currently provide programs for high school-aged people. The Skate Park is one facility that could be used by more teens, were management and oversight issues resolved. Because the activities offered by the Recreation Association are dependent on volunteers, resolving the Skate Park issues under the current system may require a volunteer to take responsibility for management of the park. An alternative solution might involve the hiring of a paid, part-time teen program coordinator, who could also be responsible for oversight of the Skate Park.

Need for More Parks and Playgrounds in and around Orange Center

The numbers and distribution of playgrounds and recreational facilities in and around Orange Center are limited. Where they are located may also be an issue. Within the village residential districts on both sides of the Millers River, playing fields are located only at Butterfield Park, Spear Field, Muzzey Field, and the Butterfield School Playground. The Town of Orange also owns some undeveloped wooded open space lands located behind residential and industrial uses, which are largely inaccessible to the general public. The need for more parks and playgrounds near dense neighborhoods was expressed in the Orange Open Space and Recreation Plan (OSRP) as well as by Community Survey respondents. The Town of Orange may want to consider how parks, playgrounds, and natural vegetation can be incorporated into any future developments especially those that would require water and sewer service.

Table 5-9: Total Number of Recreational Sports Fields Potentially Needed Based on Standards Used by Landscape Architects

Sport	Facilities by population	Total number of facilities required	Total number of facilities currently present in Orange	Total # of facilities potentially needed in Orange
Basketball	1 goal/1000 people + full court	8 goals + 1 full court	7 goals	1 full court + 1 additional goal
Baseball	1/3000 people	2 fields	5 fields (including 2 little league)	None needed
Football/Soccer	Minimum 1 + 1/8000 people	2 football fields	1 maybe 2 fields	1 field
Tennis	1/2000 people	4 courts	3 courts	1 court

Source: *Time Saver Standards for Landscape Architects* from Harris & Dines.

One way Orange could address this need is by redeveloping vacant and underutilized sites in Orange Center as small neighborhood parks and playgrounds. The Board of Health suggested (in the Orange OSRP) that when buildings are demolished, or property seized for non-payment of back taxes, the Town should use these lots for parks.

Although there is consensus among some residents that the greatest need for small parks, playgrounds, and open space exists nearest Orange Center neighborhoods, the type and number of acres and facilities may need to be estimated. As of January, 2001, Orange had 7,219 residents. The Time Saver Standards for Landscape Architects, from Harris & Dines, shown in Table 5-9, estimate the ideal numbers of facilities for a particular population size based upon a single use of a specific surface. These standards do not take into consideration multiple sports using the same field. Based on these standards, Orange could provide an additional one and a half basketball courts, one football field, one tennis court, and one hundred more acres of athletic fields.

Table 5-10: Total Park and Preserve Acreage Potentially Needed in Orange Based on Standards for Residential Development

Type of Area	Standard Size in Contiguous Acres	Area per 1000 persons	Service Area	Total acreage currently present in Orange	Total acreage potentially needed in Orange
Community Park	25-100 acres	2 acres/1000 persons – 15 acres	1 mile radius within a residential area	12.26 acres	3 acres
Playfield	10-25 acres	1 active play area and $\frac{1}{2}$ acre per 1000	1 mile radius within a residential area	10.46 acres	4 acres of fields
Large Park	100 acres minimum	5 acres/1000 persons	3 mile radius within a residential area	Butterfield Park is 10.46 acres	28 more acres
Preserves	Several hundred acres	10 acres per 1000 persons	Entire Town	2,633 + acres of preserves*	None needed for recreation

Source: *The Time Saver Standards for Housing and Residential Development* edited by De Chiara, Panero, and Zelnik.

*Note: Includes publicly owned land and land owned by private non-profit organizations, which allow public access.

Another reference, The Time Save Standards for Housing and Residential Development, edited by De Chiara, Panero, and Zelnik provides more information on the needs of population centers for parks, playgrounds, and preserves as is shown in Table 5-10. It is important to note that these standards are presented as a rough guide and are normally used for larger population centers, which explains the differences between the required park acreage, based on population figures, and the ideal park size in acres. For example, the standard for a large park is five acres per 1,000 people. In the same row, first column, the minimum park size suggested is 100 acres, which would be appropriate for a population center containing 20,000 people. In comparison, Orange has a population between seven and eight thousand. Therefore, this table must be used as a rough guide.

The Town of Orange contains many acres of natural forested areas represented by Orange State Forest. However, within a three-mile radius of the downtown area, there appears to be a need for a large park of at least twenty-eight acres that would contain facilities similar in scope to Butterfield Park, but which could also contain hiking and fishing. Also an additional three acres of community parks and four acres of play fields could be provided.

The information in Table 5-10 is presented as one measurement of the adequacy of the number and size of areas for recreational purposes found in Orange. According to the standards presented, a community park is usually between twenty-five and one hundred acres in size. The number of acres needed is actually based on the number of people (two acres/one thousand people) within a mile of the concentrated residential area. Therefore Orange, having a population of approximately 7,500 needs an additional three acres of community parks. The same methods are used to interpret the other park standards. The final column recommends the addition of four acres of play fields, and twenty-eight acres of large parks.

Improve Access to Trails and Conservation Land

Within the Town of Orange there are many areas that provide access to informal trails including snowmobile trails, fishing trails, trails in the Orange State Forest, and discontinued roads. These types of trail are very important to residents who use them. When they are on private lands, they are used with or without the permission of the landowner. Public access to the trail is not guaranteed. Even if the current landowner permits trail use, a new landowner may not. As large lots become ever smaller through subdivision, access to trails become even less secure.

More formal trails maintained for public access are rare. The main areas that offer trail access to the public include:

- New England Forestry Foundation (NEFF) Memorial Forests (The Battle-Dorrance Forest and the Fitz Memorial Forest) (*see Community Facilities and Services Map*);
- Warwick State Forest, the Tully Mountain Wildlife Management Area and the Tully Trail;
- Hosmer Woods Tree Farm/Bicentennial Park.

NEFF owns and manages Community Forests that are typically open for public use all over New England. The quality of the trails on each forest may be maintained or enhanced over time with the support of community members.

The Warwick State Forest and the Tully Mountain Wildlife Management Area in northeastern Orange provide access to a very special trail system. The 18-mile Tully Trail connects stunning wooded slopes, scenic overlooks and vistas, as well as several waterfalls on public and private lands in Orange, Warwick, and Royalston, Massachusetts. The Trustees of Reservations manages a lakeside campground on Tully Lake in Royalston offering a good starting and ending point for the trail. The Tully Trail is a regionally significant cultural resource that could be a part of any recreational-based eco-tourism activity. The Hosmer Woods Tree Farm trails can be accessed via the Kiwanis / Bicentennial Park.

Establishing new multi-use recreational trails that connect Orange's open space, natural, historic, and cultural resources to residential areas is an objective shared by many communities. Creating a network of trails in Orange might be best realized neighborhood by neighborhood. For example, residents living near Hosmer Woods, who would like to have access to the Town land via a connecting trail could begin to layout some possibilities. The same thing could be pursued in other areas if residents were motivated. In the future, were additional parkland acquired to serve Orange Center residents, connecting trails could be a consideration.

Recreational Resources Recommendations

- Continue to pursue funding to construct the Riverfront Park, once the design plans are completed. Orange is planning to apply for Self-Help funds for this project.
- Develop a community-based philanthropic organization that could receive private donations from individuals and organizations for recreational and cultural programming.
- Hire a professional grant writer to generate new sources of revenue for recreational, cultural, and other community programs and facilities.
- Consider increasing funding for the management of all Town parks and playgrounds including finding additional sources such as grants from private foundations and the DCS' Urban Self Help Program.
- Consider increasing the funding for upgrades to the facilities and increased staffing for Lake Mattawa.
- Consider increasing funding for the expansion of recreational programming with a special emphasis on teen programs and activities, and additional summer programs.

- Explore the development of a Teen Center.
- Identify areas for Town acquisition of land for future parks and playgrounds with particular consideration given to sites near downtown.
- Re-energize efforts to create a river-based trail along the Millers River that would include a put-in at the proposed Riverfront Park.
- Continue to use the Town Hall and other existing spaces to provide entertainment for residents and visitors such as movies and live theatre.

Community Facilities and Services Map inserted here