

CHAPTER

1

NATURAL RESOURCES AND OPEN SPACE

Introduction

The Town of Orange did not prepare a full Natural Resources and Open Space chapter for the Orange Master Plan. Orange completed its Open Space and Recreation Plan in 2001. The Open Space and Recreation Plan was approved by the Massachusetts Executive Office of Environmental Affairs, Division of Conservation Services. Due to funding constraints, the Town selected to use the Open Space and Recreation Plan, and its information and recommendations, to prepare the open space sections of Orange's Community Development Plan (2004) and for this Master Plan.

Open Space chapters for the Community Development Plans created under Executive Order 418, as Orange's was, typically have two components: (1) the identification and mapping of the community's significant natural, open space, historic, and scenic assets; and (2) the creation of a Land Use Suitability Map. A Land Use Suitability Map indicates which areas in a community may be undevelopable due to environmental constraints. These areas include wetlands, areas with steep slopes, and land that has been permanently protected as open space. A Land Use Suitability Map also shows which areas are possibly developable, and which areas may be unsuitable for future development due to certain environmental characteristics.

Information and maps from the Orange Open Space and Recreation Plan were especially important during the creation of the Land Use Suitability Map and the development suitability maps for guiding future land uses and growth. The development suitability maps (*contained in the Economic Development chapter*) indicate which areas of Orange may be the most appropriate for future industrial/large commercial, small commercial, and residential development.

The Open Space and Recreation Plan is an important document that helps guide Orange's planning priorities and initiatives, including the Community Development Plan and this Master Plan. In addition to the extensive information it contains on Orange's natural, recreational, historic, and scenic resources, the Open Space and Recreation Plan is also valuable for the vision it set forth for Orange and the goals and recommendations it established for the Town.

The Natural Resource and Open Space chapter for the Orange Master Plan provides an overview of the Open Space and Recreation Plan's key goals and recommendations. The chapter also discusses the methodology behind the Land Use Suitability Map and the designation of certain areas in Orange as undevelopable or potentially developable. The Land Use Suitability Map also contains updated information on open space in Orange, and

reflects the land parcels that have become permanently protected from development since the Open Space and Recreation Plan's completion.

Open Space and Recreation Plan Goals and Key Recommendations

The goals contained in Orange's Open Space and Recreation Plan are "based on the vision of an ideal Orange that has emerged from the planning processes that the Town has undergone in recent years. According to this vision, the ideal Orange would have an historic downtown bustling with commerce, community-based cultural activities, and support programs for children, teens, and elders. Commerce and industry would be located in well defined pockets, hidden or designed to protect the character of the historic districts. Development would be offset by a largely protected greenbelt of forested hills, prominent monadnocks, pristine streams, and farmlands. Most people would live in areas where residential development already exists around Orange Center and the other village centers. Within these village centers, parks, playgrounds, sports fields, and natural areas would be within walking distance and would be accessible to the physically handicapped as well. Play lots for young children would be scattered throughout districts with apartments that lack yard space. The hills, lakes, beaches, trails, and connected protected open spaces would provide almost unlimited recreation, scenic vistas, and wildlife viewing possibilities within a regionally recognized greenway that stretches from New Hampshire to the Connecticut River and the Quabbin Reservation." (Orange Open Space and Recreation Plan, p. 8-1)

Open Space and Recreation Plan Goals

1. Ensure that the Town of Orange retains its predominantly rural character and maintains or improves the quality of its air and water and the diversity and integrity of native flora and fauna, through the conservation of locally and regionally important natural and cultural resources.
2. Ensure that the Town of Orange improves the quality, quantity, and accessibility of its recreational resources for current and future generations.

Open Space and Recreation Plan Key Recommendations and Action Steps

The Orange Open Space Planning Committee that developed the Open Space and Recreation Plan identified priority recommendations and action steps for implementing the Open Space Plan. Two tiers of actions were identified. The first tier included the five most important recommendations and action steps:

- Support the development of a waterfront park on the site of the old Town Barn by the Waterfront Park Committee, which would add needed public access to the Millers River and could provide an opportunity to create handicapped accessible open space in the downtown area.

- Create and empower an officially appointed Open Space Committee.
- Identify key parcels of land in Orange Center for play areas and sports fields by conducting a survey within each neighborhood to ascertain the recreational and open space needs of these residents, and by conducting a parcel level analysis of all vacant land in Orange Center.
- Support farmland preservation through the Massachusetts Agricultural Preservation Restriction (APR) Program by determining farmers' interest in protecting their lands and by sponsoring a Town Meeting Warrant article setting a yearly contribution from the Town to match APR funds.
- Promote and help protect historically significant landscapes, the National Historic District in downtown Orange, and the North Orange and Tully village centers by developing a portfolio for each significantly historical landscape parcel describing its historic value, and by partnering with the Mount Grace Conservation Land Trust, the State's APR program, and the North Quabbin Regional Landscape Partnership.

The second tier of action items identified by the Open Space Planning Committee are no less important for realizing the overall vision of Orange residents for their community:

- Initiate a Master Planning process to identify solutions for land use and growth management, and revise the Orange Zoning Bylaws as appropriate. Use Executive Order 418 funding to develop and update the 1991 Master Plan Survey.
- Determine for each Town-owned parcel of land its potential uses and which municipal board or department would be the most appropriate manager.
- Seek to permanently protect from development all lands that contain unusual plant communities and rare and endangered species habitat, including buffer lands.
- Retain protected land on the tax rolls whenever possible by making estate planning concepts, practices, and contacts accessible through legal presentations at local libraries.
- Officially designate local scenic roads after holding public hearings to determine the popularity of the designation for each road considered.

As the Open Space and Recreation Plan indicates, "the types of actions and programs listed above will take resources, of which human resources will be the most important. Most of these actions will require volunteer time and effort, instead of funding. Where money is required, such as to permanently protect open space, it does not have to be provided by the Town of Orange alone. State and federal governmental agencies, private non-profit conservation agencies, and foundations are more likely to invest land protection money in projects that have a broad base of community support."

Identification of Potentially Suitable Areas for Future Development

This section of the Natural Resources and Open Space chapter builds on the results of the mapping and inventory of Orange's natural, open space, scenic, historic, and recreational resources that were conducted for the Orange Open Space and Recreation Plan.

This section discusses a methodology for identifying potential locations for future development. The methodology focuses first on identifying which areas of Orange may be unsuitable for any future development due to the environmental and open space constraints documented in the Open Space and Recreation Plan. It removes those areas from consideration, and then works with the remaining areas to identify potential locations for new development. This methodology is similar to that which was used for the recent buildup analyses which were sponsored by the Executive Office of Environmental Affairs (EOEA) and conducted for communities statewide, though the absolute and potential constraints considered here are slightly more extensive. The primary product of this section of Natural Resources and Open Space chapter is the Land Use Suitability Map.

The basic analysis for identifying potential locations for new development which is discussed here is expanded upon in the Economic Development and Housing chapters. The Economic Development and Housing chapters include an evaluation of where the potentially most suitable sites for future large industrial/commercial and small commercial, and residential development respectively may be located.

Figure 1-1 lays out the general methodology for identifying land within the Town of Orange that is potentially suitable for future development. The narrative which follows the figure provides the details of each step in this methodology.

Figure 1-1: Methodology for Identifying Potentially Suitable Land for Development

Step 1 – Absolute Constraints. Using the Orange Open Space and Recreation Plan as a starting point, identify land areas with environmental constraints that make the areas unsuitable for future development. Absolutely constrained lands include wetlands, water bodies, Zone I recharge areas for public drinking water supplies, and areas with steep slopes over 25 percent, and land parcels that have been permanently protected as open space. Remove these areas from further consideration for development.



Step 2 – Potential Constraints. Identify which land areas are not absolutely constrained from development (as described in Step 1), but which may still be undesirable or unsuitable for development because of certain additional environmental characteristics. Potential constrained lands include areas with slopes of 15 to 25 percent, aquifer areas, Zone II and Interim Wellhead Protection Areas, sensitive habitat areas, prime farmland, and the regional greenway. This step relies on mapping completed for the Open Space and Recreation Plan.



Step 3 – Developed Land. Identify areas with developed land (as determined by MassGIS) such as land currently in residential, commercial, or industrial use.



Step 4 – Potentially Developable Land. Identify land areas that are neither presently developed (from Step 3) nor absolutely constrained from development (from Step 1). Add to this land any parcels that are currently developed, but that are vacant or underutilized and that have been identified as potential sites for redevelopment. The resulting area represents the potentially developable land within the Town of Orange.



Step 5 – Suitable Land for Future Development. From the potentially developable land (from Step 4), identify which areas may be most suitable for future residential, commercial, or industrial development, taking into account the potential environmental constraints that were identified earlier (in Step 2) and other considerations such as current infrastructure and zoning
this step is primarily discussed in the Housing and Economic Development chapters of the Master Plan.)

Step 1: Identify Areas with Absolute Environmental or Open Space Constraints

This step identifies land with absolute environmental or open space constraints that make it unsuitable for new development. The areas with these constraints are shown on the natural resource maps developed for the Orange Open Space and Recreation Plan. Areas with one or more of these constraints are excluded from the potentially developable land shown on the Land Use Suitability Map. Orange's open space information has been updated to reflect the parcels which have become permanently protected as open space since the completion of the Open Space and Recreation Plan in 2001. The following areas are considered to be absolutely constrained from development:

- National Wetlands Inventory wetlands. The location of these wetlands has been documented by the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) project. Wetlands in Massachusetts are protected from development under the Massachusetts Wetlands Protection Act (Massachusetts General Laws, Chapter 131, Section 40). The NWI project provides an approximation of the wetlands that are subject to the Wetlands Protection Act. Wetlands are required to be verified on a case-by-case, parcel-by-parcel basis to be fully protected from future development.
- 100 foot buffer area of wetlands. The State Wetlands Protection Act regulates and restricts development within 100 feet of wetlands.
- Rivers, ponds, and other water bodies. The locations of these water resources have been identified by MassGIS, using NWI data on pond and lake locations, and MacConnell land use data on other water bodies (land use code = 20 (Water)).
- 200 foot buffer areas of rivers. The Massachusetts Wetlands Protection Act regulates and restricts development within 200 feet of riverbanks. Riverfront areas were added to the Wetlands Protection Act after the passage of the Rivers Protection Act in 1996.
- Public water supplies and Zone I Wellhead Protection Areas. The locations of these resources have been documented by the Massachusetts Department of Environmental Protection (DEP). The land uses in Zone I areas (the 400-foot radius around public water supplies) can have an immediate effect on well water quality.
- Areas with a slope of over 25 percent. The information on slopes has been derived from contour line data produced by the U.S. Geological Survey. It is generally considered unfeasible to build on slopes of 25 percent or greater, due to the high costs of construction, the likelihood of erosion, and the difficulty of traversing such steep terrain.

- Permanently protected open space areas. These areas have been located using parcel maps and information from the Town Assessors' office, Mount Grace Land Conservation Trust, and the Open Space data layer produced by MassGIS. The permanently protected open space areas include both publicly and privately owned properties. The publicly owned properties include land areas, such as state forests, that are owned by a Massachusetts state conservation agency, as well as parcels that are owned by the Town of Orange and under the jurisdiction of the Conservation Commission. Privately owned properties that are permanently protected as open space are owned by conservation groups, such as Mount Grace Land Conservation Trust, or have deed restrictions to prevent future development.

The open space information used for the community's Open Space and Recreation Plan has been updated to reflect land parcels that have become permanently protected since the Open Space and Recreation Plan's completion in 2001. As shown in Table 1-1, since 2001, the amount of permanently protected land in Orange has increased by approximately 4,000 acres (142%). As of April 2004, 6,802 acres of land in Orange are permanently protected from development; 54 percent of this land is privately owned, and the remainder is publicly owned. The permanently protected parcels account for 30 percent of the Town's total land area (23,045 acres).

Table 1-1: Permanently Protected Land in Orange, 2001 and 2004

Permanently Protected Land	Area in Acres, 2001	Area in Acres, 2004	Change 2001-2004	
			Number of Acres	Percentage Change
Publicly-Owned	1,722	3,112	1,390	81%
Privately-Owned	1,108	3,690	2,582	233%
Total Area	2,830	6,802	3,972	140%

Source: Orange Open Space and Recreation Plan, 2001; MassGIS, April 2004; acreage estimated by FRCOG GIS staff.

Step 2: Identify Areas with Potential Environmental Constraints

This step identifies land that is not absolutely constrained from development, but which may still be undesirable or unsuitable for new development because of other potential environmental constraints. The areas with potential constraints are shown on the maps in the Orange Open Space and Recreation Plan. Many of these areas are also shown on the Land Use Suitability Map.

The areas that are potentially constrained from future development include:

- Areas with a slope of 15 to 25 percent. The information on slopes has been derived from contour line data produced by the U.S. Geological Survey (USGS). Building on slopes of 15 to 25 percent can result in adverse environmental impacts, including erosion. In addition, slopes of 15 to 25 percent can pose constraints on industrial and commercial development. Large industrial and commercial facilities typically require relatively flat slopes, and it can be prohibitively expensive to regrade a site to that extent.
- Aquifers. The locations of these underground resources have been identified by MassGIS and the Massachusetts Department of Environmental Protection (DEP). The potential yield of the aquifers was determined using surficial geological data provided by MassGIS and maps produced by the USGS. Aquifers provide the source for drinking water supplies such as community wells. Underground aquifer levels are maintained by groundwater flow from aquifer recharge areas. Protecting groundwater and aquifer recharge areas from degradation is important to maintaining the quality of drinking water supplies.
- Interim Wellhead Protection Areas and Zone II Areas. Data on the Interim Wellhead Protection Areas and Zone II Areas comes from the DEP. These areas surround public water supplies. A wellhead protection area includes the sections of an aquifer from which a well would be expected to draw during an extended period (up to 6 months) without precipitation. As a result, land uses within wellhead protection areas can have an impact on drinking water quality. The location and extent of Zone II Wellhead Protection Areas have been verified through DEP hydro-geologic modeling. Orange has two Zone II Areas. In the absence of hydro-geologic modeling studies, an Interim Wellhead Protection Area may be established by the DEP. The radius of an Interim Wellhead Protection Area will vary from 400 feet to half a mile, depending on a well's known pumping rate or DEP default values if the pumping rate is unknown.
- Estimated Habitats of Rare Wildlife in wetland resource areas, Priority Habitats of Rare Species, and Core Habitats for Rare Species and Natural Communities. The locations of these resources have been identified by the Massachusetts Natural Heritage and Endangered Species Program (NHESP), as the primary, most-important habitat areas for the State's rare and endangered species. Development in the Estimated Habitats of Rare-wetlands Wildlife is regulated under the State Wetlands Protection Act. The other rare and endangered species documented by the NHESP are protected under the Massachusetts Endangered Species Act.
- Areas with Prime Farmland Soils. The areas with prime farmland soils have been identified using the 1979 U.S. Department of Agriculture, Soil Conservation Service map, "Important Farmlands in Franklin County." Prime farmland soils have the best combination of physical and chemical characteristics for crop production. Protecting areas with prime farmland soils for agricultural purposes can help farming activities remain viable within the community.

- Regional Greenway. The greenway reflects the regional environmental corridors that were mapped for the Franklin County Regional Open Space Plan, and additional priority open space areas that were identified through the Orange Open Space Planning process.

Step 3: Identify Areas that Contain Developed Land Uses

This step identifies land that is currently developed. This identification relies on the 1999 MacConnell land use data provided by MassGIS. The MassGIS land use datalayer has 21 land use classifications interpreted from 1:25,000 scale aerial photography. Table 1-2 lists land uses that are considered to be developed. The areas with developed land uses are shown on the Land Use Suitability Map.

Table 1-2: Developed Land Uses

Land Use Code	Land Use	Land Use Description
8	Spectator Recreation	Stadiums, racetracks, fairgrounds, drive-in theaters
9	Water-Based Recreation	Beaches, marinas, swimming pools
10	Residential	Multi-family apartment buildings
11	Residential	Homes on lots less than a quarter-acre
12	Residential	Homes on lots a quarter-acre to a half-acre
13	Residential	Homes on lots larger than a half-acre
15	Commercial	General urban, shopping centers
16	Industrial	Light and heavy industry
17	Urban Open	Parks, cemeteries, public and institutional buildings and greenspaces
18	Transportation	Airports, docks, divided highway, freight storage, railroads
19	Waste Disposal	Landfills, sewage lagoons

Source: Massachusetts Geographic Information System group, Description of MassGIS Land Use Datalayer and MacConnell Land Use Codes.

Step 4: Identify Areas that are Potentially Developable

This step identifies land that is potentially developable. The potentially developable area is first defined to include locations that are neither presently developed (from Step 3) nor absolutely constrained from development (from Step 1). The potentially developable land area may then be expanded to include parcels of land which are currently developed, but which have been identified by the Town as being vacant or underutilized and therefore potentially suitable for redevelopment. Priority should be given to developed parcels that are publicly-owned, or that are privately-owned but whose owners would support redevelopment of their sites.

Step 5: Identify the Potentially Suitable Areas for Future Residential, Commercial, or Industrial Development

This step considers specific criteria for determining the potentially suitable locations for different types of development, including industrial and commercial businesses, and new homes. Among the considerations are the potential development constraints identified earlier (in Step 2), current zoning, and present and proposed infrastructure, including roads, and public water and sewer systems. This step is discussed more in the mapping sections of the Economic Development and Housing chapters. The results of this step are shown on the Industrial/Large Commercial Development Suitability Map, and on the Small Commercial and Residential Development Suitability Map. Both maps appear in the Economic Development chapter of the Master Plan.

Insert Land Use Suitability Map here.